

Specialty Gas Equipment

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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Specialty Gas Equipment

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High Delivery Pressure
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Fully Auto PLC Base

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Life Science
Intelleswitch for Laser and High Flow

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Liquid Supply Liquid Phase

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Stainless Steel VJ

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Wireless Transducer
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Wired

Status Checker
CO2 Monitor
VMG

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Midas Gas Detector
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Midas Package
Xensepoint XCD Package

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Modular Point of Use

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WeldPur
MaxPur
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GC Carrier and Process Gas Dual
High Capacity High Flow
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OMI-2
Click On

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Flexible Metal Pigtails
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Generator Back Up Panel
TOC
FT-IR

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NirotFlow Lab LCMS
Nitrogen Gen LCMS
TriGas w Comp
TriGas
TriGas LCMS 5001
Trigas Membrane w Comp

Nitrogen

High Purity 99.9999
High Flow 72 LPM 95-99.95 Purity
High Flow 557 LPM 95-99.95
High Purity 99.99-99.9999
4-131 LPM 95-99.95 Purity
54-467 LPM 95-99.95 Purity
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Air Dryer
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Stainless Steel VJ

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- Ramp

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- Automatic

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Cylinder Warming Blanket

Worldwide Cylinder Connection

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- Lab Series 2000 gas Cabinet for Toxic and Corrosive Gases
- Lab Series 3000 Gas Cabinet for Highly Toxic and Pyrophoric Gases

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NS 1000 Series Gas Cabinet for Flammable Gases
NS 2000 gas Cabinet for Toxic and Corrosive Gases
NS 3000 Gas Cabinet for Highly Toxic and Pyrophoric Gases

NS7000 Series Valve Manifold Box(VMB)

Life Science

RDF Catalog
Service Connector
Dual Outlet Line Reg for Incubators
Life Science Switchover
Cryogenic Freezer Manifold
Solvent System

Medical

Click Style Regulator
Health Care Manifolds
Health Care Headers

Laser

Start Up Kits
Assist Gas Hoses
Lasing Gas Semi Auto Manifold
Assist Gas Dome Loaded Reg
Assist Gas Laser Station
Assist Gas Supply Fully Auto Cylinder Supply
Assist Gas Supply Fully Auto Dewar Supply
Line Regulator Panel
Laser Gas Supply Systems
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Cylinder Mounting Tri Rack
Plasma Point of Use

GC Installation

All Gases by Generator with Cylinder Backup
Smart Design
Hydrogen as Carrier and Fuel supplied by cylinder
Traditional Design
Hydrogen as Carrier and Fuel supplied by cylinder
Smart Design
Hydrogen as Carrier and Fuel supplied by
Generators, N2 Make up Gas x Cyl Smart Design
Nitrogen as Carrier Gas and Zero Air Supplied by
Generators H2 Supplied by Cylinders Traditional
Design
Hydrogen as Carrier Zero Air and N2 Make Up X
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N2 Carrier Hydrogen Fuel And Zero Air x
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H2 as Carrier Gas and Zero Air Supplied by
Generators H2 Supplied by Cylinders Traditional
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Central Gas Supply for Multiple GC's Traditional
Design

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Design Assistance for Architectural and
Engineering Program
Design and Installation Services


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Pressure Regulators

**Specialty Gases and Equipment
Product Reference Guide**

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Regulator Selection, Installation and Operation

The primary function of a regulator is to reduce high-pressure gas in a cylinder or process line to a lower, usable level as it passes from the cylinder to a piece of equipment. A regulator is not a flow control device. It is used to control delivery pressure only.

Since there are numerous hazards and potential for contamination associated with specialty gases—hazards that vary with the gas, the equipment used, and with the particular application—it is necessary to take the proper precautions to assure safety in high-pressure gas control. Contamination can occur during cylinder change out or from an improperly specified regulator or other component in your gas delivery system.

Before performing any operation with which you are not familiar, seek the advice of an experienced individual. In addition to adhering to the safety and operating rules provided here, the user should be aware of the additional safe operating practices peculiar to each piece of equipment and each application. Contact Airgas® National Technical Support at 1-800-939-5711 or your local Airgas representative when in doubt about correct handling procedures.

Note: Never use any regulator for gases other than those for which it is intended.

The following is applicable to pressure regulators used with flammable, oxidant, corrosive, inert, or toxic gases, when it is necessary to reduce cylinder supply pressure to a lower use pressure.

How Regulators Work

Single-Stage Regulators

High-pressure media enter the regulator through the inlet into the high-pressure chamber (see Figure 1). When the adjusting knob is turned clockwise, it compresses the range spring and exerts a force on

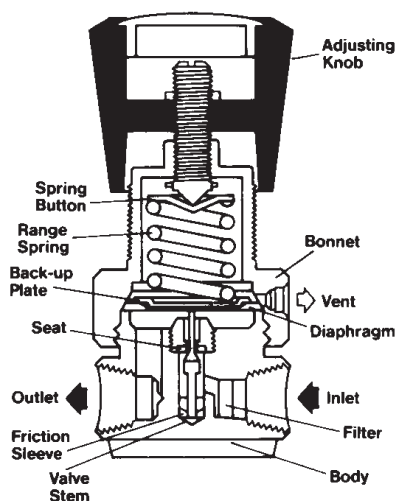


Figure 1

the diaphragm, which pushes the valve stem open. This releases gas into the low-pressure chamber, exerting an opposing force on the diaphragm. An equilibrium is reached when the spring force on the diaphragm is equal to the opposing force of the gas in the low-pressure chamber.

In a single-stage regulator, delivery pressure increases as cylinder pressure decays, because there is less gas pressure exerted on the valve stem. Thus, frequent adjustment of the control knob is required to maintain constant delivery pressure. This does not pose a problem, however, with pipelines and liquefied gas products where inlet pressure is maintained relatively constant.

Two-Stage Regulators

A two-stage regulator functions similarly to two, single-stage regulators in series. The first stage reduces inlet pressure to a preset intermediate pressure, typically 350 to 500 psig. By adjusting the control knob, the second stage reduces the intermediate pressure to the desired delivery pressure.

Like the single-stage regulator, outlet pressure from the first stage of the two-stage regulator rises as cylinder pressure decreases. However, instead of passing out of the regulator, the gas flows into the second stage where the pressure is moderated. Thus, delivery pressure remains constant even as cylinder pressure decays, eliminating the need for frequent control knob adjustment.

Selecting the Proper Regulator

Line and Cylinder Regulators

Line regulators are typically point-of-use regulators serving low-pressure pipelines. They are also used in conjunction with high-pressure cylinder regulators that limit the inlet pressure to 250 to 400 psig.

Cylinder regulators are available in either single-stage or two-stage models for high-purity, general purpose, or special service applications.

High-Purity Regulators

High-purity regulators are designed and constructed to provide diffusion resistance and easy cleanup. Metal diaphragms and high-purity seats and seals minimize or eliminate outgassing and inboard diffusion. These regulators should be capable of containing and removing contaminants during cylinder change out. Only bar stock body regulators should be used for these gases.

General Purpose Regulators

General purpose regulators are designed for economy and longevity. They are recommended for noncorrosive general plant, pilot plant, and maintenance shop applications where diffusion resistance is not required. These types of regulators are not for analytical or high-purity applications.

Special Service Regulators

Special service regulators are specifically constructed for special applications including oxygen, acetylene, and fluorine service and high-pressure, ultra-high-pressure and corrosion service.

To make your selection easier, this catalog lists the proper regulator for almost every gas, pressure, and situation. Simply look up the gas or mixture for your application and you will find the appropriate regulator listed under “Recommended Equipment.” CGA valve outlets are also noted for each gas and gas mixture. The regulator must be equipped with the appropriate CGA connection for the cylinder valve outlet.

Putting the Regulator into Service

1. Identify the regulator. Check the label and the inlet and outlet gauges. Ascertain that the high-pressure gauge is suitable for the pressure of the cylinder or source system.
2. Inspect the regulator. Check the regulator for evidence of damage or contamination. If there is evidence of physical damage or foreign material inside the regulator, contact your customer service representative for return information.
3. Inspect the cylinder valve. Check the cylinder valve for evidence of damage or contamination. Remove any foreign material before attaching the regulator.
4. Attach the regulator. Fasten the regulator to the cylinder and tighten the inlet nut securely.
5. Close the regulator. To close the regulator, turn the adjusting knob to the full counterclockwise position. The regulator must be closed before opening the cylinder valve.

Safety-Checking the System

With the regulator adjusting knob turned fully counterclockwise, place both hands on the cylinder valve and open it slowly, allowing the pressure to rise gradually in the regulator. Stand as shown (see Figure 2) with the cylinder valve between you and the regulator. When the high-pressure gauge indicates maximum pressure, open the cylinder valve fully.

Always close the cylinder valve when product delivery is not needed. Do not leave it open when the equipment is unattended or not operating.



Figure 2

Adjusting the Pressure

Turn the adjusting knob clockwise and establish the required use pressure by referring to the low-pressure gauge. Make sure that the cylinder valve is easily accessible.

Precautionary Measures

1. Never exchange the discharge (low-pressure) gauge for one of lower pressure. The gauge may rupture if the adjusting knob is unintentionally turned too far.
2. Check diaphragm regulators for creep (leakage of gas from the high-pressure to the low-pressure side when the adjusting knob is turned fully counterclockwise).
3. Provide check valves. Back-pressure protection is needed to prevent damage to the regulator. Gas from a high-pressure system can flow back into the regulator.

Removing the Regulator from Service

1. Close the cylinder valve.
2. Vent the gas. Vent the gas in the regulator and/or system, or isolate the system, and vent the gas in the regulator by turning the adjusting knob clockwise so that no pressure is trapped inside the regulator. If the gas is flammable, corrosive, toxic, or an oxidant, take appropriate measures to render it innocuous by employing a suitable disposal system before venting the gas to the atmosphere.
3. Close the regulator. After relieving all the gas pressure, turn the adjusting knob counterclockwise as far as it will go.
4. Disconnect low-pressure equipment. All low-pressure equipment connected to sources of high pressure should be disconnected entirely or, if not, independently vented to the atmosphere as soon as the operation is either over or shut down for an extended period of time.
5. Disconnect the regulator.
6. Protect the regulator. If the regulator is to remain out of service, protect the inlet and outlet fittings from dirt, contamination, or mechanical damage.
7. Replace the cylinder outlet seal and valve cap.

Safety Measures for Pressure-Reducing Regulators

Failure to take appropriate safety measures, including those listed below and the measures outlined in safety information provided with each product, may result in asphyxiation, fire and explosion, chemical burns, cold burns, poisoning and system overpressurization. Any of these may result in serious injury or death.

The following general safety measures should be taken when using pressure-reducing regulators. These measures are applicable for typical applications only. They are not comprehensive. Before operation, special consideration must be given to pressure limitations, system containment, purging requirements, etc., to determine if additional safety measures are required.

1. Always keep the regulator clean.
2. Always pressurize a regulator slowly, while standing with the cylinder valve between you and the regulator.
3. Never swap gauges or inlet fittings, and never change gas service.
4. Never lubricate a regulator or use pipe dopes. This includes inlet fittings which are intended to be installed dry.
5. Never reverse flow through a regulator or rely upon it to act as a check valve. It will not perform this function.
6. Always depressurize a regulator before closing the adjusting knob and removing the regulator from the cylinder. This is especially important in two-stage regulators that can trap high-pressure gas in the first stage. Such trapped gas can vent spontaneously at any time, releasing hazardous gas or projectiles.
7. Replace your regulators before they are worn out. The operation of a compressed gas regulator to the point of failure is a false economy.

Regulators should be inspected for wear and overhauled or replaced on an established schedule. In the case of oxidant regulators, it is preferable to replace, rather than overhaul, the regulator. Cleaning an oxygen regulator is usually more expensive than the purchase price of a new unit. In recent years, superior fire-resistant materials have been used in many regulators. Some new models are specifically designed to resist and manage ignition, should it occur. Thus, the inherent safety of a new regulator can be a significant improvement over that of an older, rebuilt regulator. Changes in regulators through the years have included the use of new materials, such as PTFE® and Viton®, and design changes such as internal flame shields, heavy heat-sink components, minimally-sized polymer components, and substitutions of metals for polymers.

Pressure Regulators- *Analytic Series*

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**ANALYTIC SERIES
PRESSURE REGULATORS**

General-Purpose Brass

Brass Line Regulators

Description: These general-purpose, single-stage line regulators provide a constant pressure at the point of use. The external chrome nickel plating allows the exterior surfaces to maintain a good appearance in outdoor environments. They feature a 302 stainless steel diaphragm for excellent performance, long life, and easy maintenance.



Design Features

Filtered Seat (10 micron)

for added gas stream purity and extended service life.

Convuluted Stainless Steel Diaphragms (302 SS)

provide precise pressure control.

Large, 2½" Nickel-Plated Brass Gauges

for accurate, easy reading.

Encapsulated Filtered Seat Assy

protect parts, extend service life.

Nickel-Plated Bar Stock Body

provides long-lasting good looks; will not tarnish.

Two (2) 10-32 Taps

for rear mounting.

Specifications

Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.17
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.2 lbs
Ports (4)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" FNPT
Decay Inlet Characteristic	1.8 psi/100 psi

Materials

Body	Nickel-Plated Brass
Bonnet	Chrome Plated Die Cast
Seat	PTFE
Diaphragm	302 Stainless Steel
Gauges	2½" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Valve Stem	316 Stainless Steel
Valve Spring	18-8 Stainless Steel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y11-AS210A	Brass	3,000	25	500	0-30
Y11-AS210B	Brass	3,000	50	810	0-60
Y11-AS210D	Brass	3,000	100	1,350	0-200
Y11-AS210F	Brass	3,000	250	1,720	0-400

Available Options

Product Number	Description
Y99-26160	¼" MNPT x ¼" Compression Brass
Y99-216162	¼" MNPT x ½" Compression Brass
Y15-418984	Wall Mount Bracket

Single-Stage Brass Regulators

Description: This general-purpose, single-stage regulator is well suited for closely monitored, short run work. The stainless steel diaphragm makes it suitable for analytical applications. The regulator has a compact design to reduce weight and make the regulator more durable. The external chrome plating allows the exterior surfaces to maintain a good appearance in outdoor environments. Nickel plating of the internal gas path surfaces makes it an excellent choice for analytical applications. A preset safety relief valve makes these regulators suitable for use only with noncorrosive gases.

General-Purpose Brass

ANALYTIC SERIES PRESSURE REGULATORS



Design Features

Filtered Seat (10 micron)
for added gas stream purity and extended service life.

Convolute Stainless Steel Diaphragms (302 SS)
provide precise pressure control.

Large, 2½" Nickel-Plated Brass Gauges
for accurate, easy reading.

Outlet Needle Valve

Preset Safety Relief Valve
prevents excessive pressure buildup.

Encapsulated Filtered Seat Assy
protect parts, extend service life.

Chrome Nickel-Plated Bar Stock Body
provides long-lasting good looks; will not tarnish.

Two (2) 10-32 Taps
for rear mounting.

Specifications		Materials	
Maximum Rated Inlet Pressure	3,500 psig	Body	Chrome Nickel-Plated Brass
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig	Bonnet	Chrome Plated Die Cast
Flow Capacity	Cv=0.17	Seat	PTFE
Ambient Operating Temperature	-40° F to +165° F	Diaphragm	302 Stainless Steel
Designed Leak Rate	Bubble-Tight (helium)	Gauges	2½" Nickel-Plated Brass
Weight	3.5 lbs	Filter	Nickel-Plated Bronze
Ports (5)	¼" FNPT	Valve Stem	316 Stainless Steel
Inlet	¼" FNPT	Valve Spring	18-8 Stainless Steel
Outlet	¼" MNPT	Outlet Valve	Nickel-Plated Brass
Decay Inlet Characteristic	1.8 psi/100 psi	Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y11-AS215A (CGA)	Brass	3,000	25	500	0-30
Y11-AS215B (CGA)	Brass	3,000	50	810	0-60
Y11-AS215D (CGA)	Brass	3,000	100	1,350	0-200
Y11-AS215F (CGA)	Brass	3,000	250	1,720	0-400

Available Options

Product Number	Description
Y99-26120	¼" FNPT x ¼" Compression Brass
Y99-26140	¼" FNPT x ¾" Compression Brass
Y99-CKCGA	Check Valve CGA Connection

ANALYTIC SERIES PRESSURE REGULATORS

General-Purpose Brass



Two-Stage Brass Regulators

Description: These general-purpose, two-stage regulators are recommended for analytical, non-corrosive, general plant, pilot plant and maintenance shop applications. The external chrome plating allows the exterior surfaces to maintain a good appearance in outdoor environments.

Two-stage design, with its convoluted stainless steel diaphragms, provides precise pressure control from full cylinder to almost empty. A preset safety relief valve makes these regulators suitable for use only with noncorrosive gases.

Design Features

Filtered Seat (10 micron)

for added gas stream purity and extended service life.

302 SS Stainless Steel Diaphragms

provide precise pressure control.

Large, 2½" Nickel-Plated Brass Gauges

for accurate, easy reading.

Outlet Needle Valve

Preset Safety Relief Valve

prevents excessive pressure buildup.

Encapsulated Filtered Seat Assy

protect parts, extend service life.

Nickel-Plated Bar Stock Body

provides long-lasting good looks; will not tarnish.

Specifications		Materials	
Maximum Rated Inlet Pressure	3,500 psig	Body	Chrome Nickel-Plated Brass
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig	Bonnet	Chrome Plated Die Cast
Flow Capacity	Cv=0.15	Seat	PTFE
Ambient Operating Temperature	-40° F to +165° F	Diaphragm	302 Stainless Steel
Designed Leak Rate	Bubble-Tight (helium)	Gauges	2½" Nickel-Plated Brass
Weight	6.5 lbs	Filter	Nickel-Plated Bronze
Ports (5)	¼" FNPT	Valve Stem	316 Stainless Steel
Inlet	¼" FNPT	Valve Spring	18-8 Stainless Steel
Outlet	¼" MNPT	Outlet Valve	Nickel-Plated Brass
Decay Inlet Characteristic	.09 psi/100 psi	Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y12-AS215A (CGA)	Brass	3,000	25	500	0-30
Y12-AS215B (CGA)	Brass	3,000	50	810	0-60
Y12-AS215D (CGA)	Brass	3,000	100	1,350	0-200
Y12-AS215F (CGA)	Brass	3,000	250	1,720	0-400

Available Options

Product Number	Description
Y99-26120	¼" FNPT x ¼" Compression
Y99-26140	¼" FNPT x ⅜" Compression
Y99-CKCGA	Check Valve CGA Connection

Brass Line Regulators

Analytical Brass

ANALYTIC SERIES PRESSURE REGULATORS

Description: This analytical series of high-purity brass, single-stage regulators is recommended for non-corrosive analytical and process applications. It is recommended to be located as close as possible to the pressure point to maintain constant pressure. This series is ideally suited for chromatographic carrier gas applications including FID, TCD, ECD, HID, and non-corrosive gas mixtures for analytical instrumentation.

The regulator body is machined from brass bar stock, allowing minimal internal volume and eliminating large cavities and pockets associated with forged-body regulators. Chrome-plating keeps it looking good for a long time.

Design Features

Filtered Seat (10 micron)

for added gas stream purity and extended service life.

Stainless Steel Diaphragms

eliminate outgassing associated with elastometric diaphragms.

Bar Stock Body

provides low internal volume.

Encapsulated Filtered Seat Assy

protect valve seat, extend service life.

Chrome Nickel-Plated Brass Body

provides long-lasting good looks; will not tarnish.

Mounting

front panel mount bonnet and (2) #10-32 holes for rear mounting.



Specifications	Materials
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-150, 0-250 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	2.6 lbs
Ports (4)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" FNPT
Decay Inlet Characteristic	1.8 psi/100 psi

Body	Chrome Nickel-Plated Brass
Bonnet	Chrome Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2½" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Valve Stem	316 Stainless Steel
Valve Spring	18-8 Stainless Steel
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y11-AS241A	Brass	3,000	25	275	30" Hg-0-30
Y11-AS241B	Brass	3,000	50	420	0-60
Y11-AS241D	Brass	3,000	100	660	0-200
Y11-AS241E	Brass	3,000	150	750	0-200
Y11-AS241F	Brass	3,000	250	890	0-400

Available Options

Product Number	Description
Y99-26160	¼" MNPT x ¼" Compression Brass
Y99-26180	¼" MNPT x ½" Compression Brass
Y15-418984	Wall Mount Bracket

Single-Stage Brass Regulators

Description: This analytical series of high-purity brass single-stage regulators is recommended for non-corrosive analytical and process applications where precise pressure control is not required. The check valve cylinder connection prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications.

Machined from brass bar stock, this regulator body has minimal internal volume - there are no large cavities and pockets associated with forged-body regulators.

These models feature encapsulated filter assemblies to protect the valve seat from contamination, extending regulator service life while also reducing velocity of gas when opening high-pressure cylinder valves. An automatic reseating relief valve protects regulator components from over pressurization. Chrome-plating makes the appearance last through many years of service.

Analytical

ANALYTIC SERIES PRESSURE REGULATORS



Design Features

Check Valve Cylinder Connections

Prevents air and contaminants from entering process stream during cylinder change out

Stainless Steel Diaphragms

eliminates outgassing associated with elastometric diaphragms.

Bar Stock Body

for low internal volume.

Encapsulated Filter Seat Assy

for added gas stream purity and extended service life.

Chrome Nickel-Plated Brass Body

provides long-lasting good looks; will not tarnish.

Mounting

front panel mount bonnet and (2) #10-32 holes for rear mounting.

Specifications	
Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165°F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.2 lbs
Ports (6) 3HP, 3LP	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT Instrument Valve
Decay Inlet Characteristic	1.8 psi/100 psi

Materials	
Body	Chrome Nickel-Plated Brass
Bonnet	Chrome Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Valve Stem	316 Stainless Steel
Valve Spring	18-8 SS
Outlet Valve	Needle valve with 1/4" MNPT
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-AS244A (CGA)	Brass	3,500	25	250	50	0-4,000	0-30
Y11-AS244B (CGA)	Brass	3,500	50	500	100	0-4,000	0-60
Y11-AS244D (CGA)	Brass	3,500	100	1000	250	0-4,000	0-200
Y11-AS244F (CGA)	Brass	3,500	250	2000	500	0-4,000	0-400

Available Options

Product Number	Description
Y99-26120	1/4" FNPT x 1/4" Compression Brass
Y99-26140	1/4" FNPT x 1/2" Compression Brass
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Specialty Gas Equipment



Airgas
an Air Liquide company

ANALYTIC SERIES PRESSURE REGULATORS

Analytical Brass



Design Features

Check Valve Cylinder Connections

Prevents air and contaminants from entering process stream during cylinder change out

Filtered Seat

for added gas stream purity and extended service life.

Stainless Steel Diaphragms

eliminates outgassing associated with elastometric diaphragms.

Bar Stock Body

provides low internal volume.

Encapsulated Filter Seat Assy

protect valve seat, extend service life.

Chrome Nickel-Plated Brass Body

provides long-lasting good looks; will not tarnish.

Panel Mount Bonnets

front and rear.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +165°F
Designed Leak Rate	Bubble-Tight (helium)
Weight	4.7 lbs
Ports (6)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" MNPT Instrument Valve
Decay Inlet Characteristic	0.05 psi/100 psi

Two-Stage Brass Regulators

Description: This analytical series of high-purity brass, two stage regulators is recommended for non-corrosive analytical and process applications where precise pressure control is required. This series is ideally suited for chromatographic carrier gas applications including FID, TCD, ECD, HID, and non-corrosive gas mixtures for analytical instrumentation. These units feature stainless steel diaphragms and bar stock bodies with low internal volume and minimal dead space.

The check valve cylinder connection prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications. The two-stage design yields a delivery pressure change of less than 0.05/100 psi inlet change, making this one of the most accurate regulators available from full cylinder to empty. An automatic reseating relief valve protects regulator components from over pressurization while the encapsulated filter assembly protect the valve seats and extend operating service life. These regulators are chrome-plated to maintain their appearance through years of service.

Materials

Body	Chrome Nickel-Plated Brass
Bonnet	Chrome Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2½" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Valve Stem	316 Stainless Steel
Valve Spring	18-8 SS
Outlet Valve	Needle valve with ¼ MNPT
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-AS244A (CGA)	Brass	3,500	25	250	250	0-4,000	30" Hg-0-30
Y12-AS244B (CGA)	Brass	3,500	50	450	500	0-4,000	0-60
Y12-AS244D (CGA)	Brass	3,500	100	900	500	0-4,000	0-200
Y12-AS244F (CGA)	Brass	3,500	250	1500	500	0-4,000	0-400

Available Options

Product Number	Description
Y99-26120	¼" FNPT x ¼" Compression Brass
Y99-26140	¼" FNPT x ½" Compression Brass
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Specialty Gas Equipment

Check
Valve CGA

Airgas
an Air Liquide company

Brass High-Purity Single-Stage Models

Description: These brass, single-stage, high-purity regulators are recommended for non-corrosive analytical and process applications where precise flow control is not critical. A specially designed, convoluted, stainless steel diaphragm with metal to metal seals provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination.

The CGA nipple has a special high-purity, non-lubricated check valve incorporated into the nose, and a safety relief valve to protect the internal regulator components.

Each regulator is capable of withstanding an internal vacuum and is provided with a diffusion-resistant, diaphragm packless outlet valve to maintain system purity. The optional bonnet vent port (1/8 NPT) allows for the venting of hazardous gases in the event of diaphragm failure.

High-Purity Brass

ANALYTIC SERIES
PRESSURE REGULATORS



Design Features

Encapsulated Filter Seat Assy

for added gas stream purity and extended service life.

Convoluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (1/8 NPT)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Five Outlet Pressure Ranges

provide application pressure compatibility.

CGA Connection with Integral Check Valve

prevents contamination during cylinder changeout.

Materials

Body	Chrome Nickel-Plated Brass
Bonnet	Chrome Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv - 08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x 10 ⁻⁸ ccs (helium)
Weight	4 lbs
Ports (6) 3HP, 3LP	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	1.8 psi/100 psi

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-ASN245A (CGA)	Brass	3,500	25	900	0-4,000	30" Hg-0-30
Y11-ASN245B (CGA)	Brass	3,500	50	1,250	0-4,000	0-100
Y11-ASN245D (CGA)	Brass	3,500	100	1,750	0-4,000	0-200
Y11-ASN245E (CGA)	Brass	3,500	150	2,000	0-4,000	0-200
Y11-ASN245F (CGA)	Brass	3,500	250	2,700	0-4,000	0-400
Y11-ASN245G (CGA)	Brass	3,500	500	3,500	0-4,000	0-1,000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-480078	1/4" Compression Outlet Ftg Brass
Y99-SS200R4	1/4" Compression Outlet Ftg Stn Steel
Y99-26460	1/4" Compression Outlet Ftg Stn Steel
Y99-4VCR	1/4" VCR connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Specialty Gas Equipment



Airgas
an Air Liquide company

ANALYTIC SERIES PRESSURE REGULATORS

High-Purity Brass



Design Features

Encapsulated Filter Seat Assy

for added gas stream purity and extended service life.

Convuluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Four Outlet Pressure Ranges

provide application pressure compatibility.

Panel Mount Bonnets

front and rear.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv 0.06
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x 10 ⁻⁸ ccs (helium)
Weight	5.4 lbs
Ports (2) 2HP, 3LP, 1 PRV	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.05 psi/100 psi

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-ASN245A (CGA)	Brass	3,500	25	190	0-4,000	30" Hg-0-30
Y12-ASN245B (CGA)	Brass	3,500	50	270	0-4,000	0-60
Y12-ASN245D (CGA)	Brass	3,500	100	380	0-4,000	0-200
Y12-ASN245E (CGA)	Brass	3,500	150	525	0-4,000	0-200
Y12-ASN245F (CGA)	Brass	3,500	250	850	0-4,000	0-400
Y12-ASN245G (CGA)	Brass	3,500	500	1000	0-4,000	0-1,000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders
Y99-480078	□" Compression Outlet Ftg Brass
Y99-SS200R4	□" Compression Outlet Ftg Stn Steel
Y99-26460	1/4" Compression Outlet Ftg Stn Steel

Brass High-Purity Two-Stage Models

Description: This series of two-stage, high-purity regulators is designed for non-corrosive analytical and process applications requiring precise, stable, delivery pressure control. The two-stage design yields a delivery pressure of less than 0.05/100 psi inlet change.

The CGA nipple has a special high-purity, non-lubricated check valve incorporated into nose and prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications. This regulator also has both a front and rear panel mount bonnet to allow for easy panel mounting.

Convuluted stainless steel diaphragms with metal to metal seals provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2 x 10⁻⁸ ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

A diaphragm packless outlet valve with a 1/4" compression fitting is provided for flow control and to maintain system purity. Captured bonnet ports are standard on both stages and allow for the venting of hazardous gases in the event of diaphragm failure. These regulators are cleaned for the most demanding high-purity service.

Materials

Body	Chrome Nickel-Plated Brass
Bonnet	Chrome Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Stainless Steel Line Models

Description: This series of stainless steel high-purity, single-stage line regulators is recommended for applications where diffusion resistance is required. These regulators are recommended for use on low-pressure pipelines serving gas chromatographs, mass spectrometers, research sampling systems, and semiconductor processing.

The specially-designed, convoluted 316L SS diaphragm provides accurate, stable delivery pressure and is capable of withstanding internal vacuum purging. These units are easily mounted to panels using the optional panel-mount nuts with the threaded bonnet. Two 10 x 32 UNF-threaded holes in the body allow for bracket or external panel mounting. The optional bonnet vent adaptor allows venting of hazardous gases in the event of diaphragm failure.

High-Purity Stainless Steel

ANALYTIC SERIES PRESSURE REGULATORS



Design Features

Convoluted 316L SS Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

High-Flow Capacity

permits excellent pressure control for multi-instrument applications.

Specifications	Materials
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-10, 0-30, 0-60, 0-100 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x10 ⁻⁸ ccs (helium)
Weight	2 lbs
Ports (4) 1HP, 3LP	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" FNPT

Body	316L Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PTFE
Diaphragm	316L SS
Gauge	2½" Stainless Steel
Filter	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	316L SS

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y11-ASC441AA	316L SS	3,000	10	140	30" Hg-0-30
Y11-ASC441A	316L SS	3,000	30	250	30" Hg-0-60
Y11-ASC441B	316L SS	3,000	60	430	0-100
Y11-ASC441C	316L SS	3,000	100	650	0-200

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y15-418984	Wall Mount Bracket
Y99-26460	¼" MNPT x ¼" Compression
Y99-26462	¼" MNPT x ¾" Compression Stn Steel

ANALYTIC SERIES PRESSURE REGULATORS

High-Purity Stainless Steel



Design Features

Convuluted 316L SS Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Encapsulated Valve Design

provides longer regulator life.

Stainless Steel Single-Stage Models

Description: These stainless steel single-stage high-purity regulators are recommended for non-corrosive analytical, mildly corrosive and process applications where precise flow control is not critical. A specially designed, convoluted 316L SS diaphragm provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination.

Each regulator is capable of withstanding an internal vacuum and is provided with a diffusion-resistant, diaphragm packless outlet valve to maintain system purity. The optional bonnet vent adaptor enables venting hazardous gases in the event of diaphragm failure.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x 10 ⁻⁸ cc/sec
Weight	4 lbs
Ports (6) 3HP, 3LP	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	1.8 psi/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PTFE
Diaphragm	316L SS
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	316L SS

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-ASC444AA (CGA)	316 Stainless Steel	3,500	10	140	0-4,000	30" Hg-0-30
Y11-ASC444A (CGA)	316 Stainless Steel	3,500	30	250	0-4,000	30" Hg-0-30
Y11-ASC444B (CGA)	316 Stainless Steel	3,500	60	430	0-4,000	0-100
Y11-ASC444D (CGA)	316 Stainless Steel	3,500	100	650	0-4,000	0-200
Y11-ASC444F (CGA)	316 Stainless Steel	3,500	250	1500	0-4,000	0-400
Y11-ASC444G (CGA)	316 Stainless Steel	3,500	500	2400	0-4,000	0-1,000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y99-SS200R4	□" Compression Outlet Ftg Strn Steel
Y99-CKSS(CGA)	Check Valve CGA Connection Strn Steel
Y15-QMS1	Quick Mounting Option for 1 Cylinder
Y15-QMS2	Quick Mounting Option for 2 Cylinders

Stainless Steel Two-Stage Models

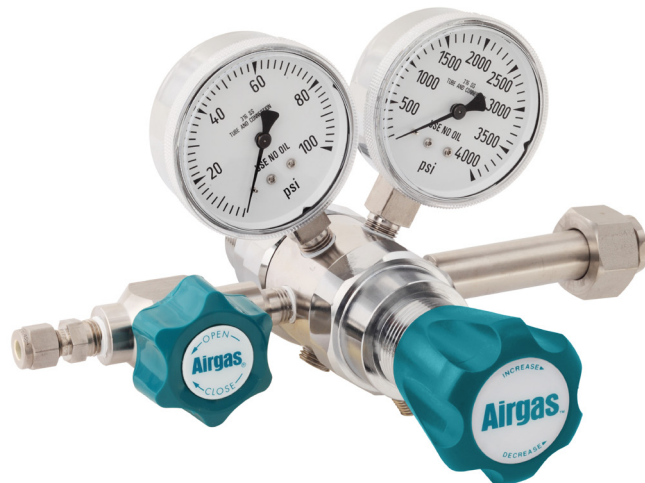
Description: This series of stainless steel two-stage high-purity regulators is designed for non-corrosive analytical, mildly corrosive and process applications requiring precise, stable delivery pressure control. The two-stage design yields a delivery pressure change of less than 0.05/100 psi inlet change.

Convoluted 316L SS diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

A diaphragm packless outlet valve with a $\frac{1}{4}$ " compression tube fitting is provided for flow control and to maintain system purity. Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are cleaned for the most demanding high-purity service.

High-Purity Stainless Steel

ANALYTIC SERIES PRESSURE REGULATORS



Design Features

Convoluted 316L SS Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with $\frac{1}{4}$ " Compression fitting)

promotes system purity.

Encapsulated Valve Design

provides longer regulator life.

Materials

Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PTFE
Diaphragm	316L SS
Gauges	2 $\frac{1}{2}$ " Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	316L SS

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2×10^{-8} cc/sec
Weight	5.4 lbs
Ports (6)	$\frac{1}{4}$ " FNPT
Inlet	$\frac{1}{4}$ " FNPT
Outlet	$\frac{1}{4}$ " Compression
Decay Inlet Characteristic	0.05 psi/100 psi

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-ASC445AA (CGA)	316L SS	4,000	10	100	0-4,000	30" Hg-0-30
Y12-ASC445A (CGA)	316L SS	4,000	30	160	0-4,000	30" Hg-0-30
Y12-ASC445B (CGA)	316L SS	4,000	60	300	0-4,000	0-100
Y12-ASC445D (CGA)	316L SS	4,000	100	400	0-4,000	0-200
Y12-ASC445E (CGA)	316L SS	4,000	250	1000	0-4,000	0-400
Y12-ASC445G-(CGA)	316L SS	4,000	500	1700	0-4,000	0-600

Available Options

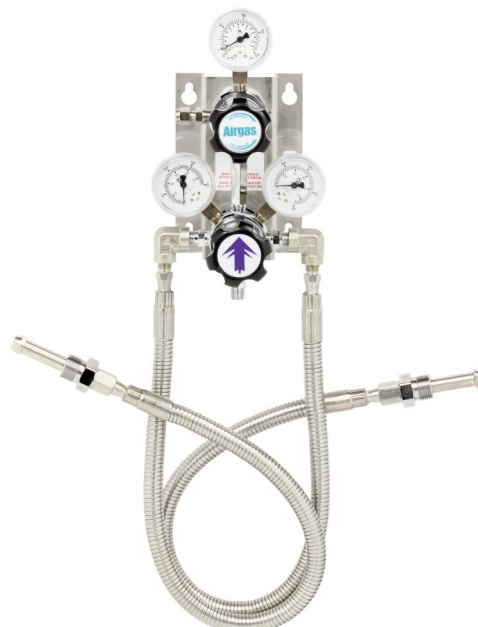
Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-SS200R4	$\frac{1}{4}$ " Compression Outlet Ftg Stn Steel
Y99-4VCR	$\frac{1}{4}$ " VCR® connection on Inlet/Outlet (VCR x $\frac{1}{4}$ " MNPT)
Y99-CKSS(CGA)	Check Valve Connection Stn Steel
Y15-QMS1	Quick Mounting Option for 1 Cylinder
Y15-QMS2	Quick Mounting Option for 2 Cylinders

Economy Automatic Switchover Regulator

Description: The Airgas® Economy Switchover System is part of our new Analytical Series of products for analytical and Life Science applications. It is a low-cost automatic switchover system designed to supply a continuous supply of high purity, non-corrosive gas. Due to the pressure differential considerations, an integral line regulator is used to maintain constant downstream pressure. The pigtails are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves.

The 6- and 8-cylinder models use our block manifold header as standard. Heaters are standard on unit with 320 CGA's for CO2 service rate for 165 scfh flow.

Note: There are no shut-off or purge valves in the Economy Series system. They may be added as an option, or, consider our High-Purity Changeover Panels. The High-Purity Changeover Panels have these valves incorporated into their design.



Design Features

Metal-to-metal diaphragm seal

no possibility of gas contamination

User-friendly priority valve

one knob switches cylinder priority

Check valves in CGA nipples

prevents contamination and back flow

Line regulator

assures stable line pressure during changeover

Materials

Body	Brass barstock, 316 Stainless Steel
Seat	PTFE
Diaphragm	316L Stainless Steel
Gauges	Nickel Plated Brass, 316 Stainless Steel
Filter	10 micron
Seals	PTFE

Specifications

Maximum Rated Inlet Pressure	3000 psig
Maximum Outlet Pressure	0-50, 0-125, 0-250, 0-500 psig
Flow Capacity	Cv=0.05
Ambient Operating Temperature	-40° F to 140° F (-38° C to 60° C)
Designed Leak Rate	1 x 10 ⁻⁸ scc/sec
Weight	10 lbs.
Ports	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Gauges	2" diameter
Alarm	Y78-820ALPK

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP802B(CGA)	2	Brass	3000	10-50	200	0-3000
Y11-CP804B(CGA)	4	Brass	3000	10-50	200	0-3000
Y11-CP806B(CGA)	6	Brass	3000	10-50	200	0-3000
Y11-CP808B(CGA)	8	Brass	3000	10-50	200	0-3000
Y11-CP802D(CGA)	2	Brass	3000	10-125	300	0-3000
Y11-CP804D(CGA)	4	Brass	3000	10-125	300	0-3000
Y11-CP806D(CGA)	6	Brass	3000	10-125	300	0-3000
Y11-CP808D(CGA)	8	Brass	3000	10-125	300	0-3000
Y11-CP802E(CGA)	2	Brass	3000	10-250	400	0-3000
Y11-CP804E(CGA)	4	Brass	3000	10-250	400	0-3000
Y11-CP806E(CGA)	6	Brass	3000	10-250	400	0-3000
Y11-CP808E(CGA)	8	Brass	3000	10-250	400	0-3000
Y11-CP120A 510*	2	Brass	250	15	90	0-3000
Y11-CP120G(CGA)	2	Brass	3000	10-500	900	0-3000

*Uses synflex® hoses; acetylene specific changeover.

Economy Automatic Switchover
Regulator Cont.

Economy

CHANGEOVER MANIFOLDS

Ordering Information						
Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP842B(CGA)	2	Stainless Steel	3000	10-50	200	0-3000
Y11-CP844B(CGA)	4	Stainless Steel	3000	10-50	200	0-3000
Y11-CP846B(CGA)	6	Stainless Steel	3000	10-50	200	0-3000
Y11-CP848B(CGA)	8	Stainless Steel	3000	10-50	200	0-3000
Y11-CP842D(CGA)	2	Stainless Steel	3000	10-125	300	0-3000
Y11-CP844D(CGA)	4	Stainless Steel	3000	10-125	300	0-3000
Y11-CP846D(CGA)	6	Stainless Steel	3000	10-125	300	0-3000
Y11-CP848D(CGA)	8	Stainless Steel	3000	10-125	300	0-3000
Y11-CP842E(CGA)	2	Stainless Steel	3000	10-250	400	0-3000
Y11-CP844E(CGA)	4	Stainless Steel	3000	10-250	400	0-3000
Y11-CP846E(CGA)	6	Stainless Steel	3000	10-250	400	0-3000
Y11-CP848E(CGA)	8	Stainless Steel	3000	10-250	400	0-3000

Available Options	
Product Number	Description
Y15-4P72K2C	6 foot pigtail upgrade option, 2 cylinders
Y15-4P72K4C	6 foot pigtail upgrade option, 4 cylinders
Y78-820ALPK	Non-Flammable Alarm Package

Pressure Regulators- General Purpose Series

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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PRESSURE REGULATORS

General-Purpose



Brass Line Regulators

Description: These general-purpose, single-stage line regulators provide a constant pressure at the point of use. The composite bonnet reduces weight. The external nickel plating, along with the composite bonnets, allows the exterior surfaces to maintain a good appearance in outdoor environments. They feature a 316 stainless steel diaphragm for excellent performance, long life, and easy maintenance. A preset safety relief valve makes these regulators suitable for use with non-corrosive gases.

Design Features

Filtered Seat

for added gas stream purity and extended service life.

Composite bonnets

reduce weight and extend finish in outdoor environments.

316 Stainless Steel Diaphragms

provide precise pressure control.

Large, 2 1/2" Nickel-Plated Brass Gauges

for accurate, easy reading.

Preset Safety Relief Valve

prevents excessive pressure buildup.

Encapsulated Filtered Seat Assy

protect parts, extend service life.

Nickel-Plated Bar Stock Body

provides long-lasting good looks; will not tarnish.

Two (2) 10-32 Taps

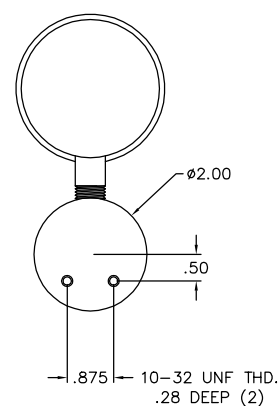
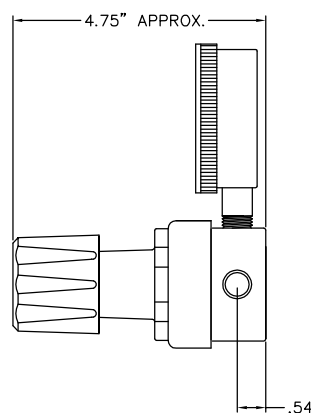
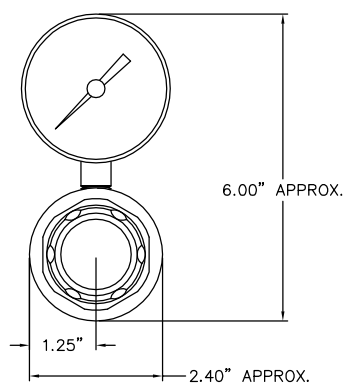
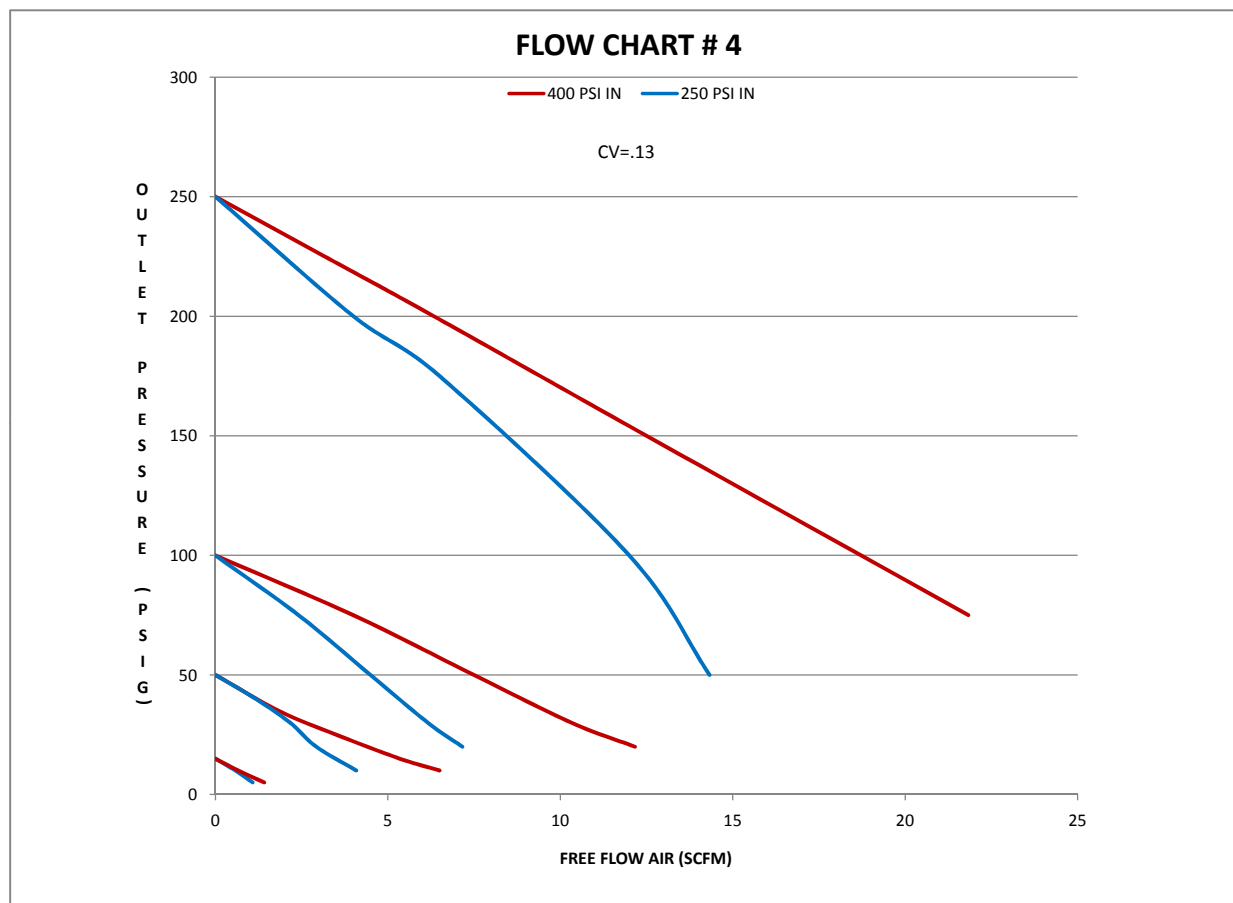
for rear mounting.

Specifications	
Maximum Rated Inlet Pressure	1,200 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.32 lbs
Ports (3)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Decay Inlet Characteristic	0.138/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Composite
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)	Relief Valve Setting (psig)
Y11-210A	Brass	1,200	25	500	0-30	85
Y11-210B	Brass	1,200	50	810	0-60	150
Y11-210D	Brass	1,200	100	1,350	0-200	150
Y11-210F	Brass	1,200	250	1,720	0-400	350

Available Options	
Product Number	Description
Y99-26160	1/4" MNPT x 1/4" Compression
Y99-216162	1/4" MNPT x 1/8" Compression
Y15-418984	Wall Mount Bracket



LINE REGULATOR

Specialty Gas Equipment

Single-Stage Brass Regulators

Description: This general-purpose, single-stage regulator is well suited for closely monitored, short run work. The stainless steel diaphragm makes it suitable for analytical applications. The regulator has a unique design to reduce weight and make the regulator more durable. The composite bonnet and the outlet valve are incorporated into the regulator body to reduce weight. The external nickel plating, along with the composite bonnets, allows the exterior surfaces to maintain a good appearance in outdoor environments. Nickel plating of the internal gas path surfaces makes it an excellent choice for analytical applications. A preset safety relief valve makes these regulators suitable for use only with noncorrosive gases.

General-Purpose

PRESSURE REGULATORS



Design Features

Filtered Seat

for added gas stream purity and extended service life.

Composite bonnets

reduce weight and extend finish in outdoor environments.

316 Stainless Steel Diaphragms

provide precise pressure control.

Large, 2 1/2" Nickel-Plated Brass Gauges

for accurate, easy reading.

Outlet Needle Valve

built into body

Preset Safety Relief Valve

prevents excessive pressure buildup.

Encapsulated Filtered Seat Assy

protect parts, extend service life.

Nickel-Plated Bar Stock Body

provides long-lasting good looks; will not tarnish.

Two (2) 10-32 Taps

for rear mounting.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.15
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.32 lbs
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.58/100 psi

Materials

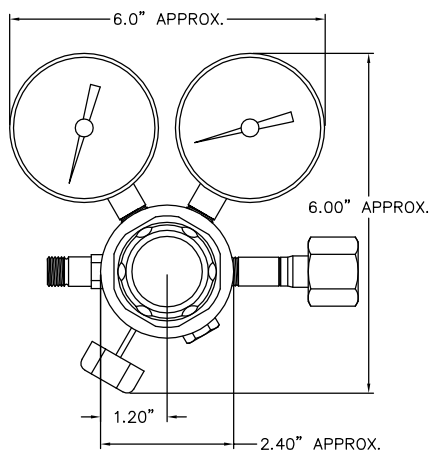
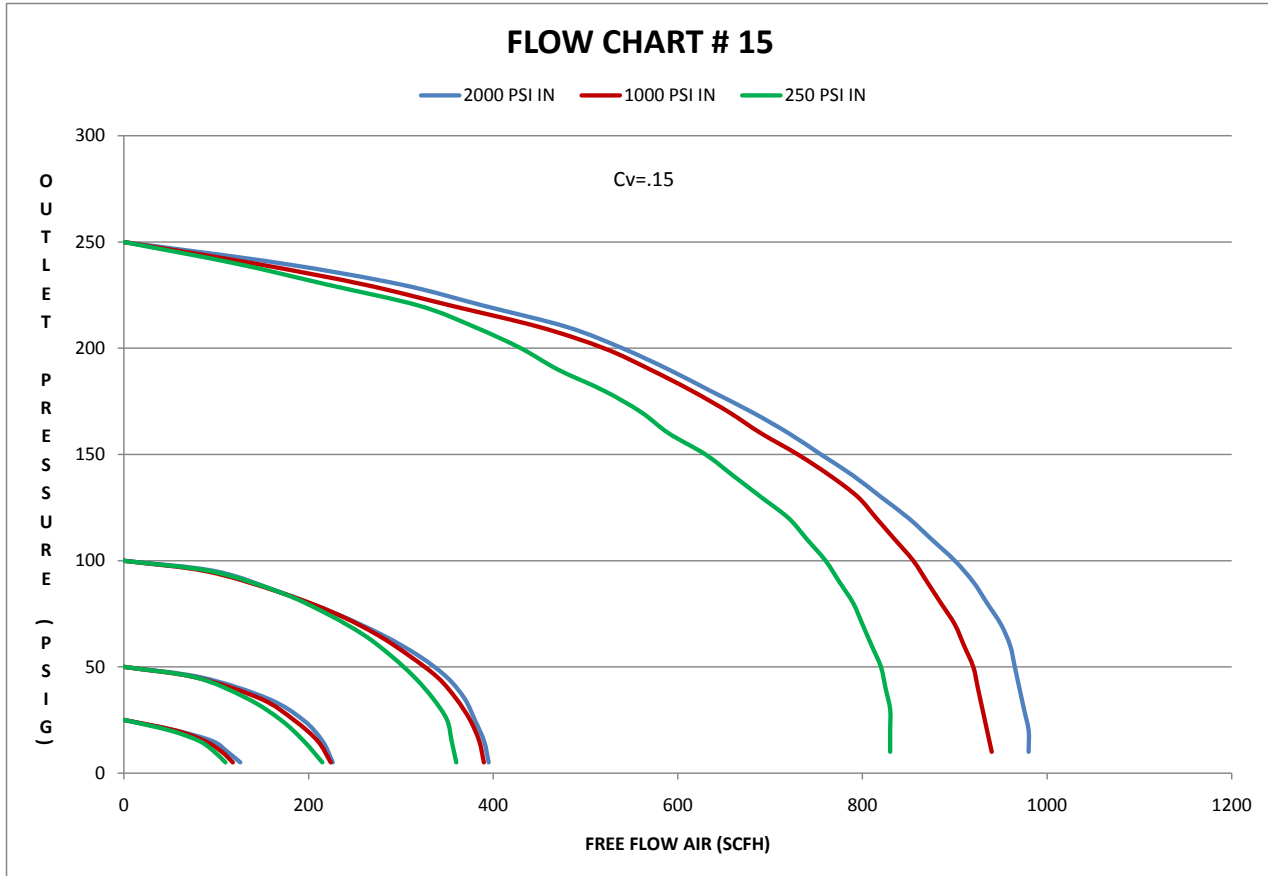
Body	Nickel-Plated Brass
Bonnet	Composite
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Ordering Information

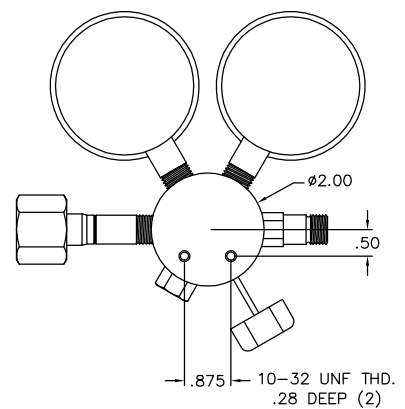
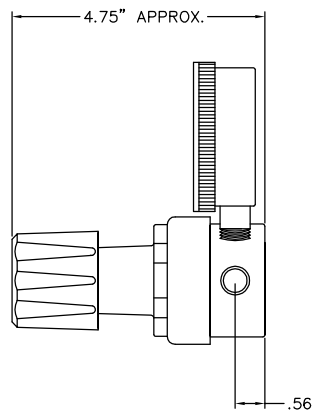
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-215A(CGA)	Brass	3,500	25	500	85	0-4,000	0-30
Y11-215B(CGA)	Brass	3,500	50	850	150	0-4,000	0-60
Y11-215D(CGA)	Brass	3,500	100	1,500	150	0-4,000	0-200
Y11-215F(CGA)	Brass	3,500	250	1,950	350	0-4,000	0-400

Available Options

Product Number	Description
Y99-26120	1/4" FNPT x 1/4" Compression
Y99-26140	1/4" FNPT x 1/8" Compression
Y99-CKCGA	Check Valve CGA Connection

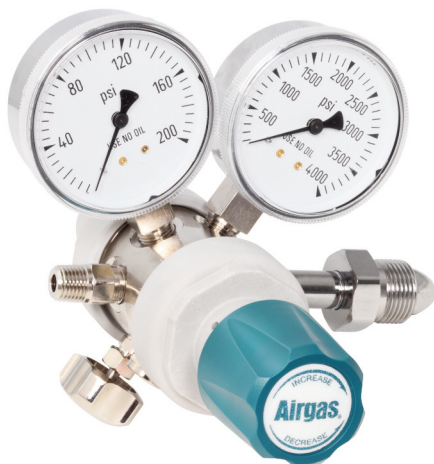


SINGLE STAGE REGULATOR



PRESSURE REGULATORS

General-Purpose



Two-Stage Brass Regulators

Description: These unique patented general-purpose, two-stage regulators are recommended for analytical, non-corrosive, general plant, pilot plant and maintenance shop applications. These regulators have a unique design to reduce weight and make the regulator more durable. The composite bonnet and the outlet valve are incorporated into the regulator body to reduce weight. The external nickel plating, along with the composite bonnets, allows the exterior surfaces to maintain a good appearance in outdoor environments. Two-stage design, with its 316 stainless steel diaphragms, provides precise pressure control from full cylinder to almost empty. A preset safety relief valve makes these regulators suitable for use only with non-corrosive gases.

Design Features

Filtered Seat

for added gas stream purity and extended service life.

Composite bonnets

reduce weight and extend finish in outdoor environments.

316 Stainless Steel Diaphragms

provide precise pressure control.

Large, 2 1/2" Nickel-Plated Brass Gauges

for accurate, easy reading.

Outlet Needle Valve

built into body

Preset Safety Relief Valve

prevents excessive pressure buildup.

Encapsulated Filtered Seat Assy

protect parts, extend service life.

Nickel-Plated Bar Stock Body

provides long-lasting good looks; will not tarnish.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	5 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.25/100 psi

Materials

Body	Nickel-Plated Brass
Bonnet	Composite
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

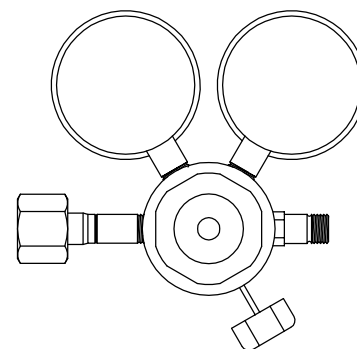
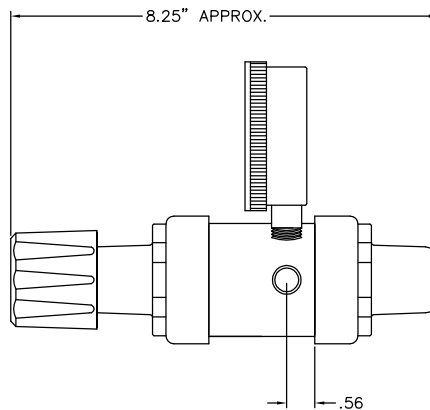
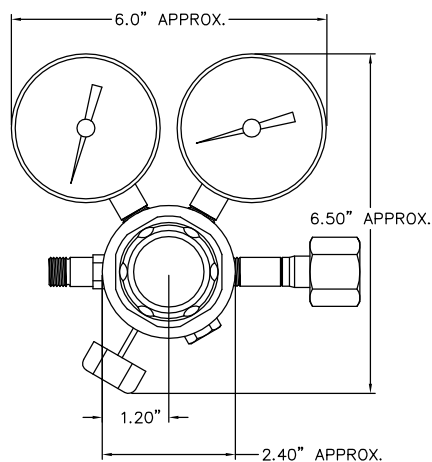
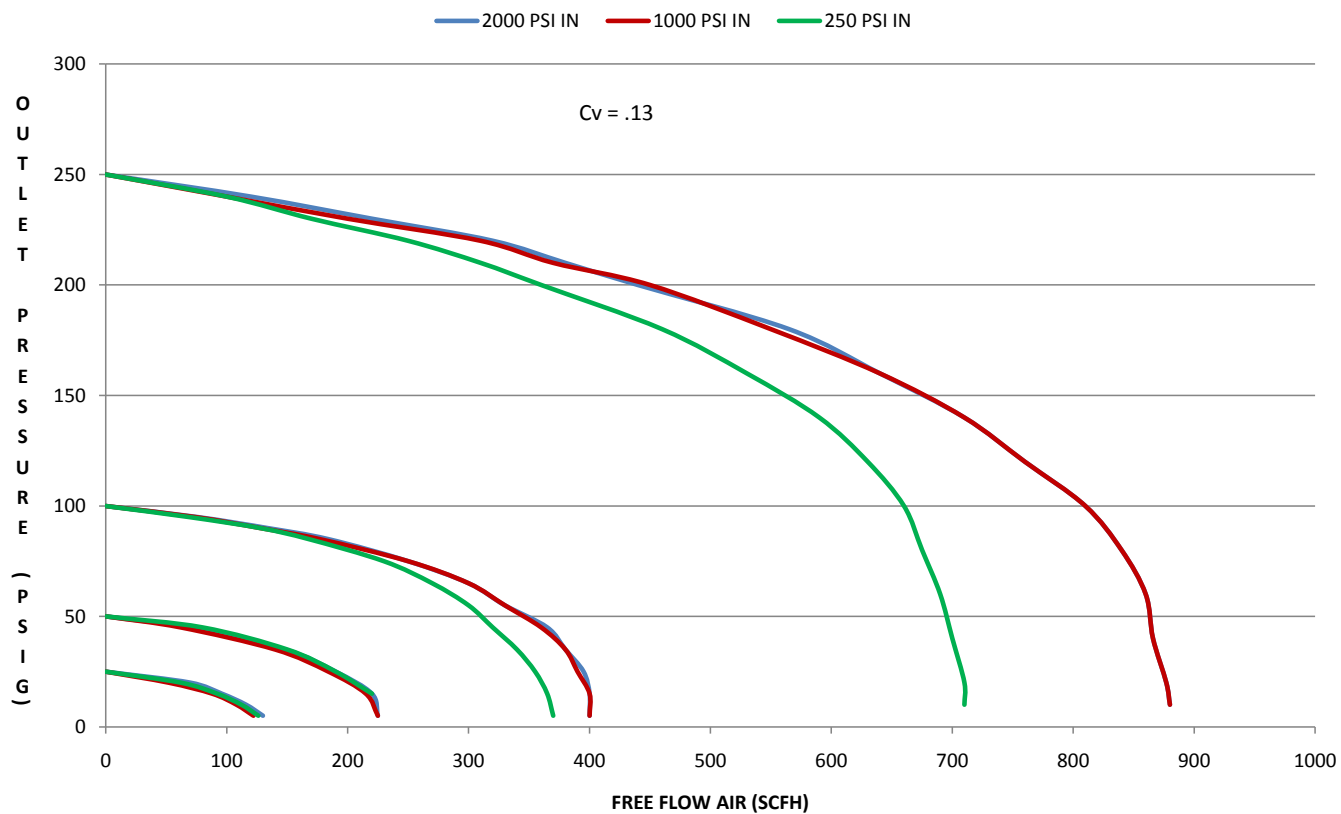
Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-215A(CGA)	Brass	3,500	25	240	85	0-4,000	0-30
Y12-215B(CGA)	Brass	3,500	50	600	150	0-4,000	0-60
Y12-215D(CGA)	Brass	3,500	100	1,200	150	0-4,000	0-200
Y12-215F(CGA)	Brass	3,500	250	1,920	350	0-4,000	0-400

Available Options

Product Number	Description
Y99-26120	1/4" FNPT x 1/4" Compression
Y99-26140	1/4" FNPT x 1/8" Compression
Y99-CKCGA	Check Valve CGA Connection

FLOW CHART # 16



TWO STAGE REGULATOR

Pressure Regulators- Analytical Series

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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Brass Line Regulators

Description: This analytical series of high-purity brass, single-stage regulators is recommended for non-corrosive analytical and process applications. It is recommended to be located as close as possible to the pressure point to maintain constant pressure. This series is ideally suited for chromatographic carrier gas applications including FID, TCD, ECD, HID, and non-corrosive gas mixtures for analytical instrumentation.

The regulator body is machined from brass bar stock, allowing minimal internal volume and eliminating large cavities and pockets associated with forged-body regulators. Nickel-plating keeps it looking good for a long time.

Design Features

Filtered Seat

for added gas stream purity and extended service life.

Stainless Steel Diaphragms

eliminate outgassing associated with elastometric diaphragms.

Bar Stock Body

provides low internal volume.

Encapsulated Filtered Seat Assy

protect valve seat, extend service life.

Nickel-Plated Brass Body

provides long-lasting good looks; will not tarnish.

Mounting

front panel mount bonnet and (2) 10-13 taps for rear mounting.

Analytical

PRESSURE REGULATORS



Specifications	
Maximum Rated Inlet Pressure	1,200 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-150, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	2.4 lbs
Ports (3)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Decay Inlet Characteristic	0.23/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Trim	Nickel-Plated Brass

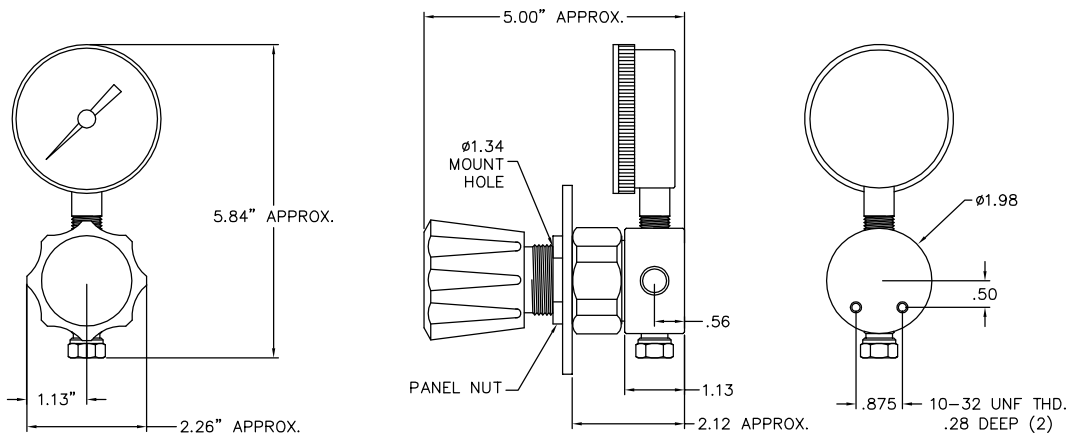
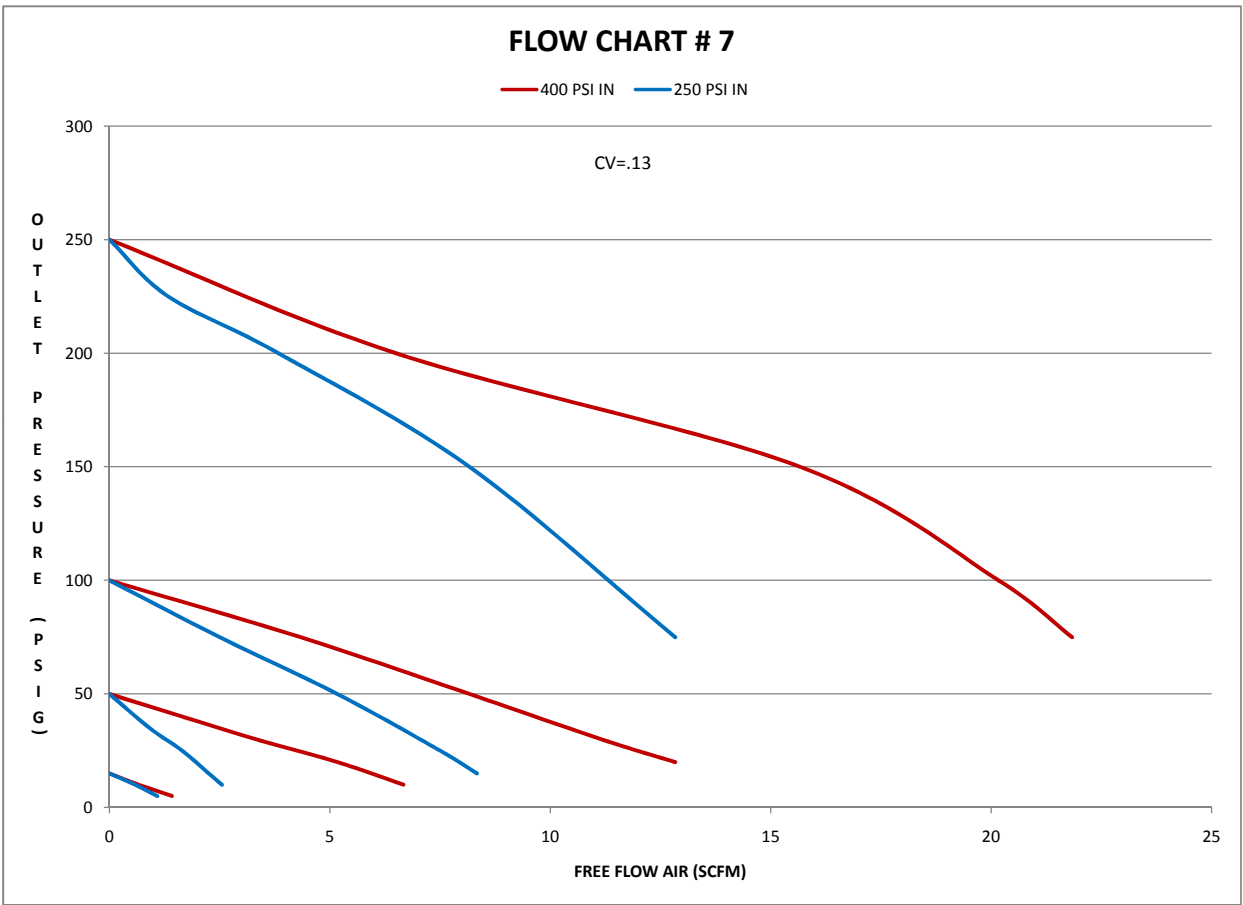
Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)	Relief Valve Setting (psig)
Y11-241A	Brass	1,200	25	275	30" Hg-0-30	85
Y11-241B	Brass	1,200	50	420	0-60	150
Y11-241D	Brass	1,200	100	660	0-200	150
Y11-241E	Brass	1,200	150	750	0-200	250
Y11-241F	Brass	1,200	250	890	0-400	350

Available Options

Product Number	Description
Y99-26160	1/4" MNPT x 1/4" Compression
Y99-26180	1/4" MNPT x 1/8" Compression
Y15-418984	Wall Mount Bracket

Specialty Gas Equipment



LINE REGULATOR

Single-Stage Brass Regulators

Description: This analytical series of high-purity brass single-stage regulators is recommended for non-corrosive analytical and process applications where precise pressure control is not required. The check valve cylinder connection prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications.

Machined from brass bar stock, this regulator body has minimal internal volume - there are no large cavities and pockets associated with forged-body regulators.

The needle valve is built into the regulator body reducing the gas path. These models feature encapsulated filter assemblies to protect the valve seat from contamination, extending regulator service life while also reducing velocity of gas when opening high-pressure cylinder valves. An automatic reseating relief valve protects regulator components from over pressurization. Nickel-plating makes the appearance last through many years of service.

Analytical

PRESSURE REGULATORS



Design Features

Check Valve Cylinder Connections

Prevents air and contaminants from entering process stream during cylinder change out

Stainless Steel Diaphragms

eliminates outgassing associated with elastometric diaphragms.

Bar Stock Body

for low internal volume.

Encapsulated Filter Seat Assy

for added gas stream purity and extended service life.

Nickel-Plated Brass Body

provides long-lasting good looks; will not tarnish.

Mounting

front panel mount bonnet and (2) 10-32 taps for rear mounting.

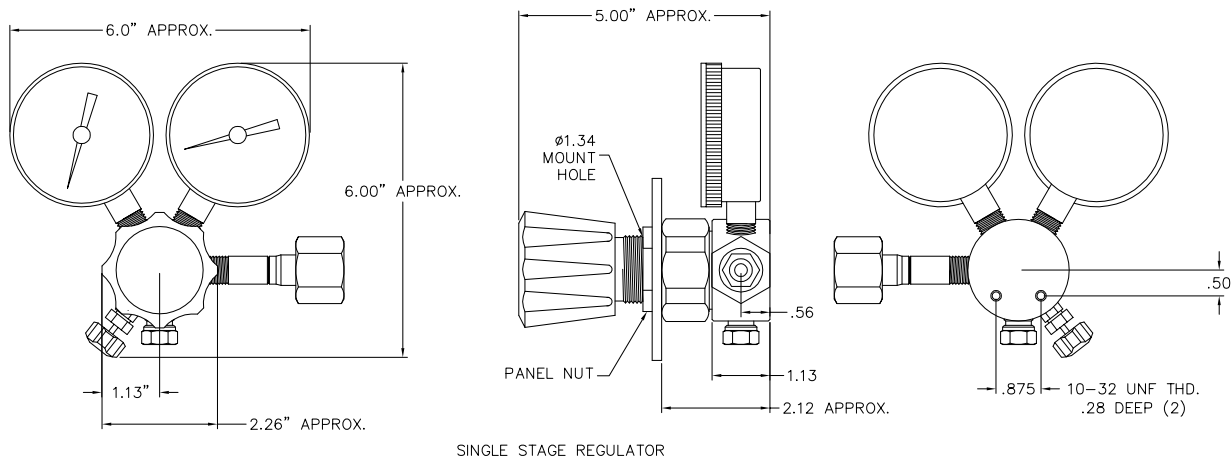
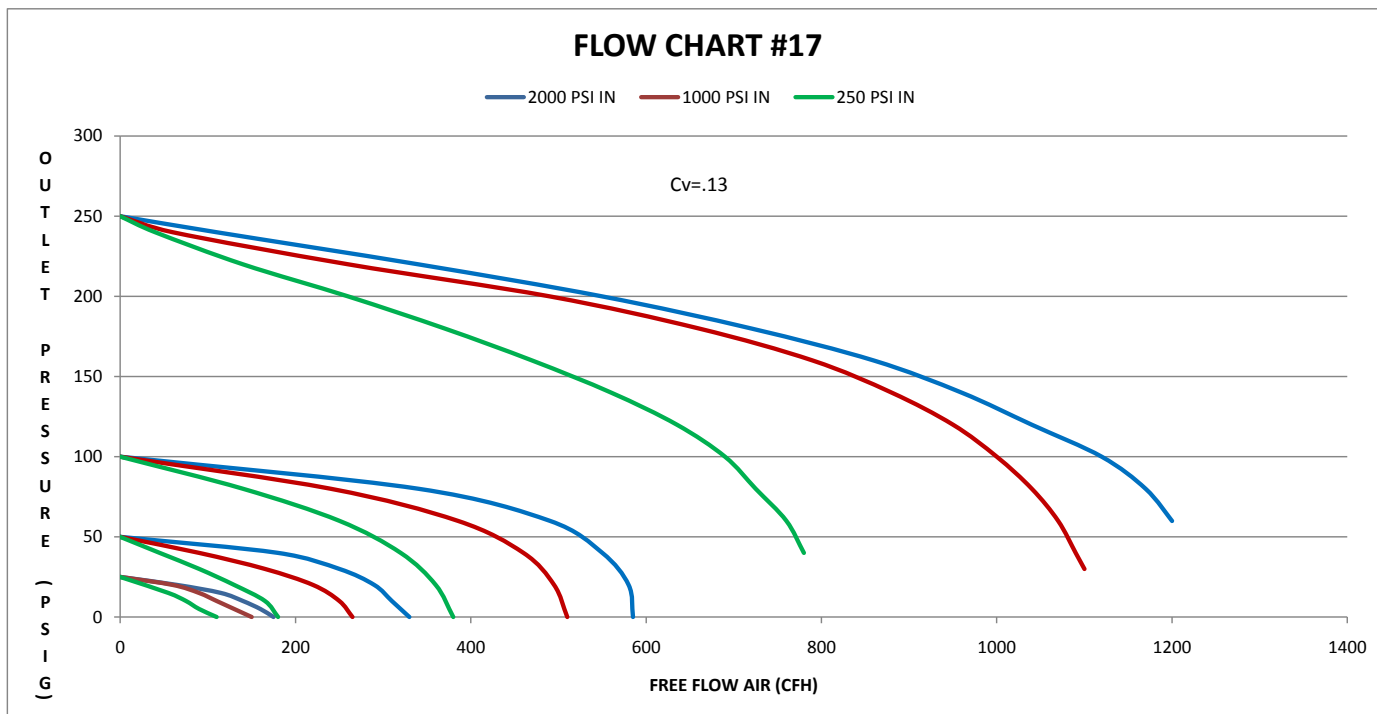
Specifications	
Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165°F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3 lbs
Ports (4)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" MNPT
Decay Inlet Characteristic	0.35/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 ½" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	Nickel-Plated Brass
Outlet Valve	Needle valve in body
Trim	Nickel-Plated Brass

Ordering Information							
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-244A(CGA)	Brass	3,500	25	250	85	0-4,000	30"-Hg-0-30"
Y11-244B(CGA)	Brass	3,500	50	500	150	0-4,000	0-60
Y11-244D(CGA)	Brass	3,500	100	1000	150	0-4,000	0-200
Y11-244F(CGA)	Brass	3,500	250	2000	350	0-4,000	0-400

Available Options

Product Number	Description
Y99-26120	¼" FNPT x ¼" Compression
Y99-26140	¼" FNPT x ½" Compression
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders





PRESSURE REGULATORS

Analytical



Design Features

Check Valve Cylinder Connections

Prevents air and contaminants from entering process stream during cylinder change out

Filtered Seat

for added gas stream purity and extended service life.

Stainless Steel Diaphragms

eliminates outgassing associated with elastometric diaphragms.

Bar Stock Body

provides low internal volume.

Encapsulated Filter Seat Assy

protect valve seat, extend service life.

Nickel-Plated Brass Body

provides long-lasting good looks; will not tarnish.

Panel Mount Bonnets

front and rear.

Two-Stage Brass Regulators

Description: This analytical series of high-purity brass, two-stage regulators is recommended for non-corrosive analytical and process applications where precise pressure control is required. This series is ideally suited for chromatographic carrier gas applications including FID, TCD, ECD, HID, and non-corrosive gas mixtures for analytical instrumentation. These units feature stainless steel diaphragms and bar stock bodies with low internal volume and minimal dead space.

The check valve cylinder connection prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications. The needle valve model has the valve built into the regulator body reducing the gas path. The two-stage design yields a delivery pressure change of less than 0.26/100 psi inlet change, making this one of the most accurate regulators available from full cylinder to empty. An automatic reseating relief valve protects regulator components from over pressurization while the encapsulated filter assembly protect the valve seats and extend operating service life. These regulators are nickel-plated to maintain their appearance through years of service.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.058
Ambient Operating Temperature	-40° F to +165°F
Designed Leak Rate	Bubble-Tight (helium)
Weight	4.4 lbs
Ports (4)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" MNPT
Decay Inlet Characteristic	0.26/100 psi

Materials

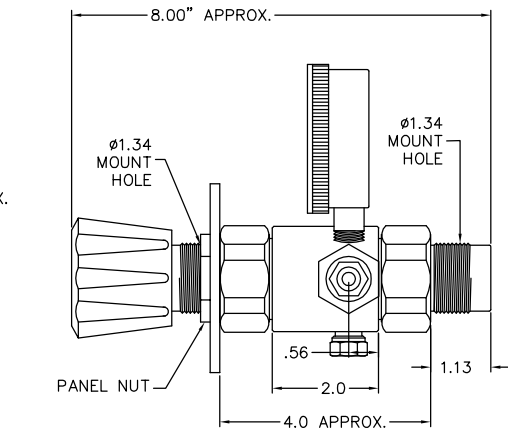
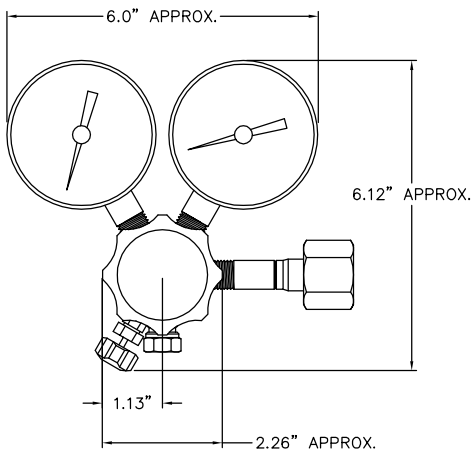
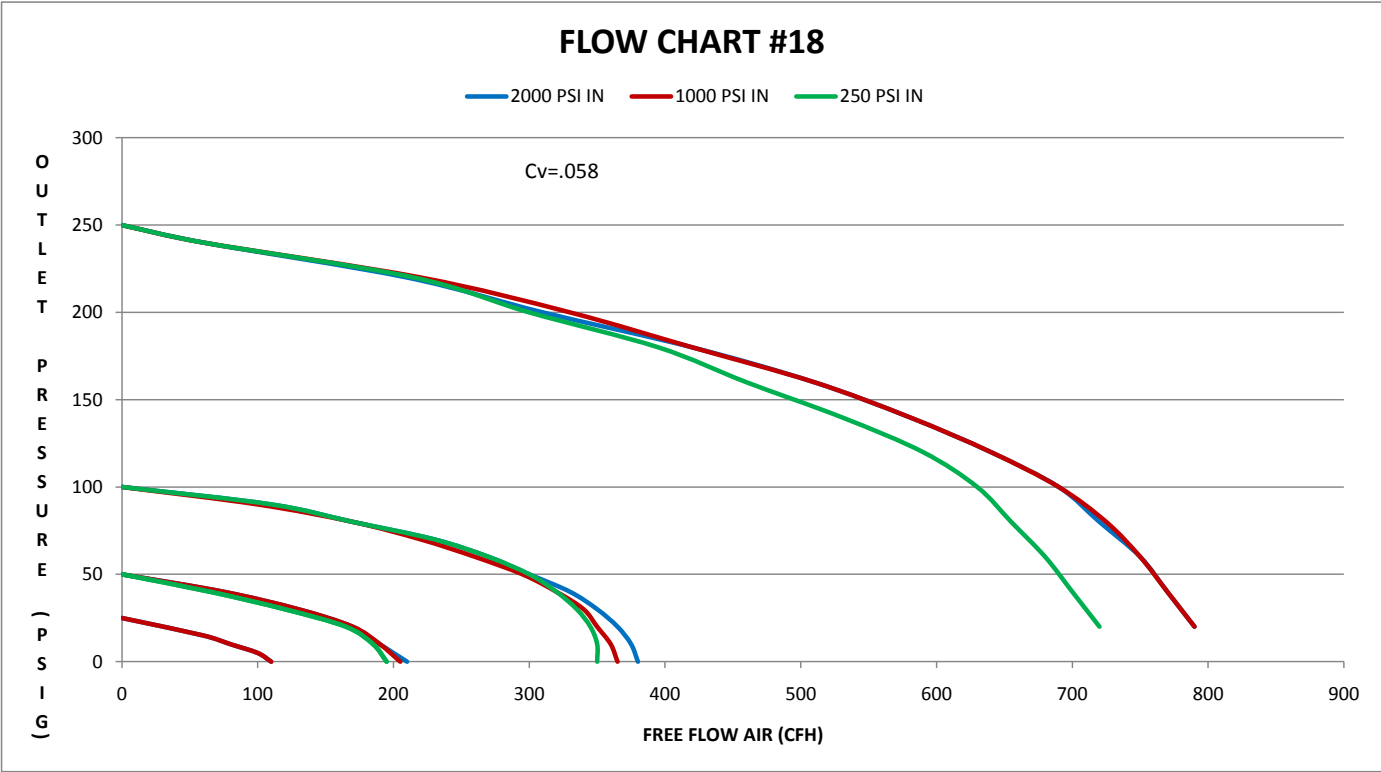
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 ½" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Needle valve in body
Trim	Nickel-Plated Brass

Ordering Information

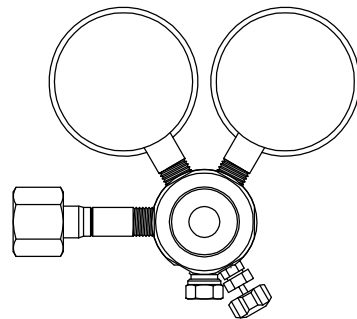
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-244A(CGA)	Brass	3,500	25	250	85	0-4,000	30" Hg-0-30
Y12-244B(CGA)	Brass	3,500	50	450	150	0-4,000	0-60
Y12-244D(CGA)	Brass	3,500	100	900	150	0-4,000	0-200
Y12-244F(CGA)	Brass	3,500	250	1500	350	0-4,000	0-400

Available Options

Product Number	Description
Y99-26120	¼" FNPT x ¼" Compression
Y99-26140	¼" FNPT x ½" Compression
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders



TWO STAGE REGULATOR



Economy Corrosive Environment Two Stage Regulator

Description: This economically priced two stage regulator is designed for analytical applications where the regulator is located in corrosive environments but uses none corrosive gases. The regulator has a stainless steel diaphragm for high purity applications; the needle valve is built into the body to shorten the gas path.

These regulators also have a check valve CGA that prevents contaminants from entering the gas stream during cylinder change out.

The regulator has liquid filled gauges to protect the gauge movement from corrosive environments damaging this movement. The bonnets are a resin material to prevent discoloration from the environment as well. This regulator will last a long time in these environments and prevent common failures as seen on other regulator commonly used in corrosive environments.

Analytical Regulators

TWO STAGE CORROSIVE ENVIRONMENTS



Design Features

Check Valve CGA

Prevents air and contaminants from entering the process stream during cylinder change out

Liquid filled gauges

prevent the environment from causing gauge failure

Resin bonnets and nickel plated brass body

protects the appearance

Stainless steel diaphragm

eliminates off gassing associated with elastomeric diaphragms

Needle valve

is built into the body to shorten gas path

Materials

Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Needle valve in body
Trim	Nickel-Plated Brass

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	5 lbs
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.23/100 psi

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-DW215A(CGA)	Brass	3500	25	250	85	0-4,000	30" Hg-0-30
Y12-DW215B(CGA)	Brass	3500	50	450	150	0-4,000	0-60
Y12-DW215D(CGA)	Brass	3500	100	900	150	0-4,000	0-200
Y12-DW215F(CGA)	Brass	3500	250	1500	350	0-4,000	0-400

PRESSURE REGULATORS

Analytical



*Y11-LC241 series shown

Gas Phase Dewar Service Regulators

Low-Pressure Brass Models

Description: This series of high-purity, single-stage regulators is designed for liquid cylinders, low-pressure mixes, and process applications where precise pressure control is not required. These regulators are recommended for non-corrosive analytical and process applications. This series is ideally suited for gas phase pressure regulation in liquid cylinder applications.

The regulator body is machined from brass bar stock, which decreases internal volume and eliminates the large cavities and pockets associated with forged-body regulators. Attractive nickel-plating looks clean and lasts for years of service.

Design Features

Filtered Seat

for added gas stream purity and extended service life.

Stainless Steel Diaphragms

eliminate outgassing associated with elastometric diaphragms.

Bar Stock Body

with low internal volume minimizes atmospheric contamination during cylinder change out.

Encapsulated Filter Seat Assy

protect valve seat and extend service life.

Dewar Service

ideal for gas service from a liquid cylinder.

Panel Mount Bonnet and (2) 10-32 Taps

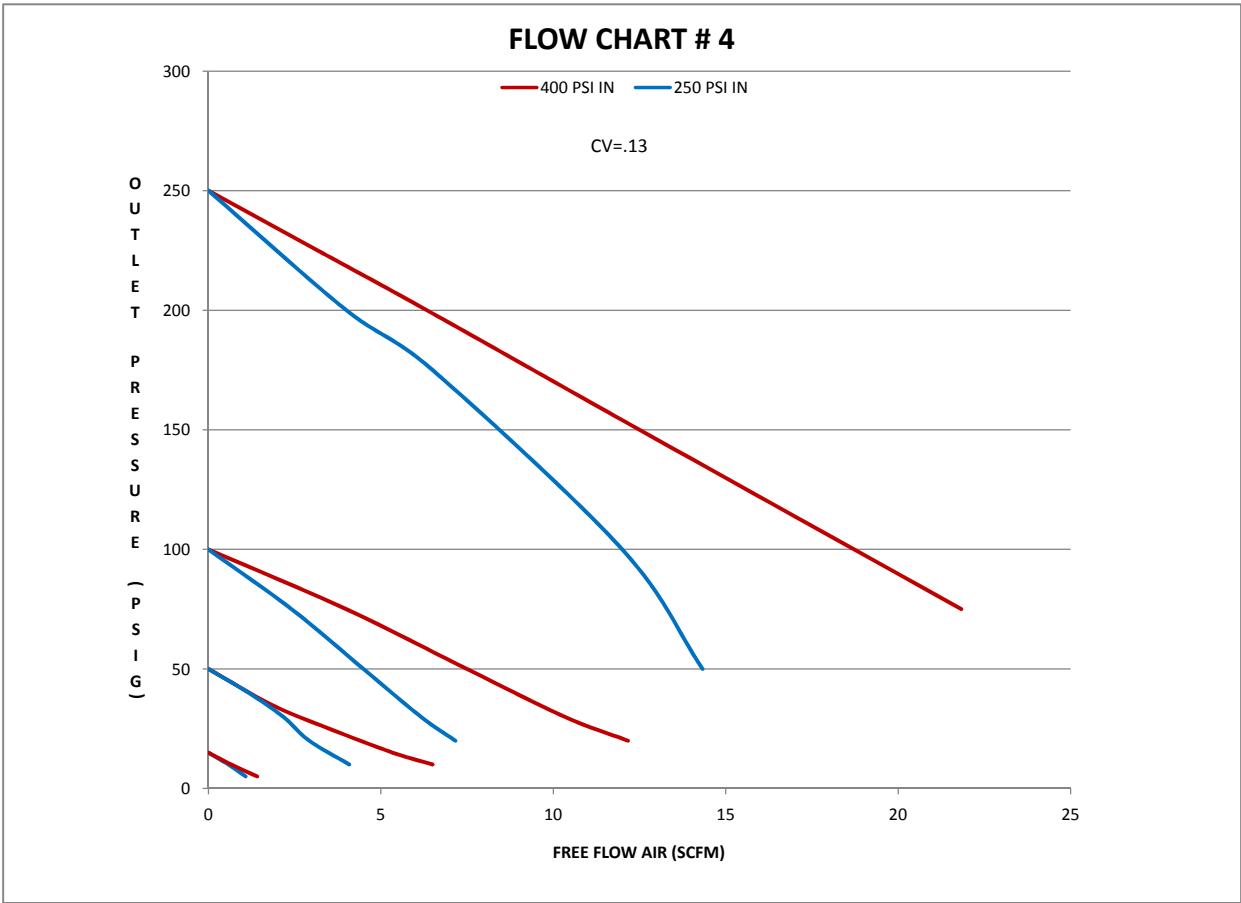
for rear mounting.

Specifications	
Maximum Rated Inlet Pressure	1,200 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.12 lbs
Ports (3)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT Instrument Valve
Decay Inlet Characteristic	0.23/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
O-Ring	PTFE
Gauge	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Ordering Information								
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)	Inlet Gauge Range (psig)	Relief Valve Setting (psig)	
Y11-LC241A(CGA)	Brass	1,200	25	275	30" Hg-0-30	None	85	
Y11-LC241B(CGA)	Brass	1,200	50	420	0-60	None	150	
Y11-LC241D(CGA)	Brass	1,200	100	650	0-200	None	150	
Y11-LC241F(CGA)	Brass	1,200	250	750	0-400	None	350	
Y11-LC251A(CGA)	Brass	1,200	25	275	30" Hg-0-30	0-400	85	
Y11-LC251B(CGA)	Brass	1,200	50	420	0-60	0-400	150	
Y11-LC251D(CGA)	Brass	1,200	100	650	0-200	0-400	150	
Y11-LC251F(CGA)	Brass	1,200	250	750	0-400	0-400	350	

Available Options		Additional Information: Ideal for gas phase pressure regulation in liquid cylinder applications.
Product Number	Description	
Y99-26120	1/4" FNPT x 1/4" Compression	
Y99-26140	1/4" FNPT x 1/8" Compression	
Y99-CKCGA	Check Valve CGA Connection	



Analytical Tee-Purge Assemblies

Description: Contamination cannot be tolerated in any high-purity analytical system. Even low levels of oxygen and moisture from the atmosphere can be extremely troublesome. An often-overlooked source of contamination may occur when changing cylinders. Atmospheric oxygen and moisture enter the regulator when it is disconnected from the cylinder. These contaminants become trapped in the high-pressure portion of the regulator upon connection to another cylinder. If allowed to remain, they are swept into the system. Depending upon the flow rate, these impurities can disrupt the process for days or even weeks.

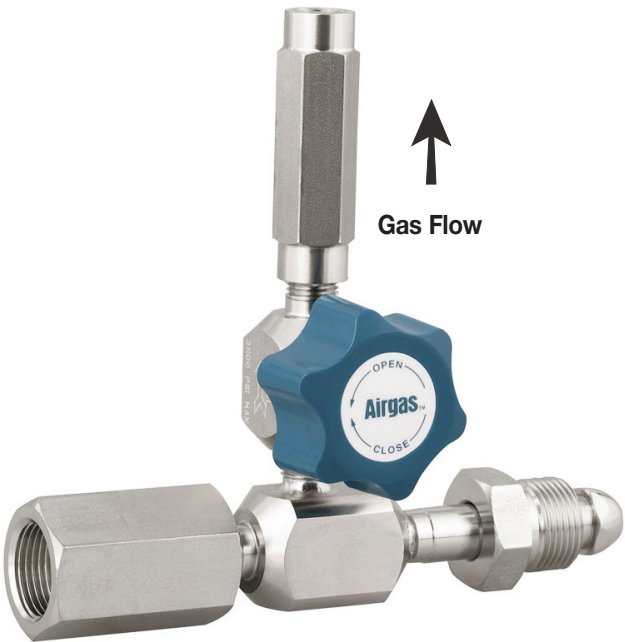
An analytical tee-purge assembly allows you to easily eliminate trapped impurities and replace them with the desired high-purity gas.

Tee-purge assemblies have been designed for use with high-purity regulators. Installed between the cylinder and the regulator, they enable you to remove contaminants before they enter the process by purging the system (including the regulator), with the process gas.

All models have a multi-turn diaphragm valve and a check valve to prevent backflow of air into the purge line.

Purge Assemblies

MISCELLANEOUS EQUIPMENT



Specifications/Materials	
Maximum Rated Inlet Pressure	3,000 psig
Body	Nickel-Plated Brass or Stainless Steel
Weight	2.5 lbs or 3.0 lbs.

Ordering Information	
Product Number	Material
Y99-TP1A(CGA)	Brass
Y99-TP4A(CGA)	Stainless Steel

Pressure Regulators- *Flowmeter Regulator Series*

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FLOWMETER REGULATORS

Single-Stage



Design Features

Filtered Seat

for added gas stream purity and extended service life.

Convuluted Stainless Steel Diaphragms

eliminate outgassing associated with elastomeric diaphragms.

Bar Stock Body

affords low internal volume.

Encapsulated Filter Seat Assy

protect valve seat, extend service life.

Nickel-Plated Brass Body

provides enhanced overall aesthetics, will not tarnish.

Superior Leak Integrity

provides superior leak integrity without contamination from non-metallic liner or seal.

Direct Reading Scale

allows the operator to read the flow directly on the tube.

Safety Relief Valve

protects flowmeter and any equipment down stream.

Flowmeter Materials

Frame	Brass
Available Float Material	Glass Stainless Steel Carboloy

Airgas FM244 Series

Description: This Airgas® FM244 series of high-purity, single-stage flowmeter regulators are recommended for non-corrosive analytical and process applications.

This regulator is part of our analytical series, machined from brass bar stock which affords minimum internal volume and eliminates large cavities and pockets associated with forged-body regulators. The flowmeter has a 65mm direct reading scale (based on air) etched into the tube. Accuracy is $\pm 5\%$ full scale with $\pm 0.25\%$ repeatability. You must specify flow rate and gas service at time of ordering.

Regulator Materials

Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Specifications for Regulator

Max Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100 psig
Flow Ranges	0.28, 2.2, 6.0, 20 & 150 scfh of air
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3 lbs.
Ports (4)	1/4" FNPT regulator; 1/8" FNPT flowmeter
Inlet	CGA connection
Outlet	1/4" MNPT Instrument Valve
Decay Inlet Characteristic	0.35/100 psi

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-FM244A(CGA)	Brass	3,500	25	*	85	0-4,000	30" Hg-0-30
Y11-FM244B(CGA)	Brass	3,500	50	*	150	0-4,000	0-60
Y11-FM244D(CGA)	Brass	3,500	100	*	150	0-4,000	0-200

*Determined by flowmeter must be specified at time of ordering. See 65 mm Flowmeter section to specify the required flow rate.

Available Options

Product Number	Description
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Airgas® FM244 Series

Description: This Airgas® FM244 series of high-purity, two-stage flowmeter regulators are recommended for non-corrosive analytical and process applications.

This regulator is part of our analytical series, machined from brass bar stock which affords minimum internal volume and eliminates large cavities and pockets associated with forged-body regulators. The flowmeter has a 65mm direct reading scale based on air etched into the tube. Accuracy is $\pm 5\%$ full scale with $\pm .25\%$ repeatability. You must specify flow rate and gas service at time of ordering.

Design Features

Filtered Seat

for added gas stream purity and extended service life.

Convoluted Stainless Steel Diaphragms

eliminate outgassing associated with elastomeric diaphragms.

Bar Stock Body

affords low internal volume.

Encapsulated Filter Seat Assy

protect valve seat, extend service life.

Nickel-Plated Brass Body

provides enhanced overall aesthetics, will not tarnish.

Superior Leak Integrity

provides superior leak integrity without contamination from non-metallic liner or seal.

Direct Reading Scale

allows the operator to read the flow directly on the tube.

Safety Relief Valve

protects flowmeter and any equipment down stream.

Specifications for Regulator

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100 psig
Flow Ranges	0.28, 2.2, 6.0, 20 & 150 scfh of air
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	5 lbs.
Ports (4)	1/4" FNPT regulator; 1/8" FNPT flowmeter
Inlet	CGA Connection
Outlet	1/4" MNPT Instrument Valve
Decay Inlet Characteristic	0.26/100 psi

Two-Stage

FLOWMETER REGULATORS



Regulator Materials

Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Flowmeter Materials

Frame	Brass
Available Float Material	Glass Stainless Steel Carboloy

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-FM244A(CGA)	Brass	3,500	25	*	85	0-4,000	30" Hg-0-30
Y12-FM244B(CGA)	Brass	3,500	50	*	150	0-4,000	0-60
Y12-FM244D(CGA)	Brass	3,500	100	*	150	0-4,000	0-200

*Determined by flowmeter—must be specified at time of ordering. See 65 mm Flowmeter section to specify the required flow rate.

Available Options

Product Number	Description
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Pressure Regulators- High Purity Brass Regulator Series

Pressure Regulators – High Purity Brass Regulator Series

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Brass High-Purity Single-Stage Models

Description: These brass, single-stage, high-purity regulators are recommended for non-corrosive analytical and process applications where precise flow control is not critical. A specially designed, convoluted, stainless steel diaphragm with metal to metal seals provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination.

These regulators come with a CGA nipple that has a special high-purity, non-lubricated check valve incorporated into nose and prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications. Each regulator is capable of withstanding an internal vacuum and is provided with a diffusion-resistant, diaphragm packless outlet valve to maintain system purity. The optional bonnet vent adaptor allows for the venting of hazardous gases in the event of diaphragm failure.

Specifications	
Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-150, 0-250, 0-500 psig
Flow Capacity	Cv = 0.12
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x10 ⁻⁹ ccs (helium)
Weight	4.6 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.78/100 psi

High-Purity

PRESSURE REGULATORS

Y11-N245



Design Features

Encapsulated Filter Seat Assy

for added gas stream purity and extended service life.

Convoluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Metal to Metal Seal for High Purity

Standard Threaded Bonnet (with optional collar-mount nuts) for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting) promotes system purity.

Six Outlet Pressure Ranges

provide application pressure compatibility.

CGA Connection with Integral Check Valve

prevents contamination during cylinder changeout.

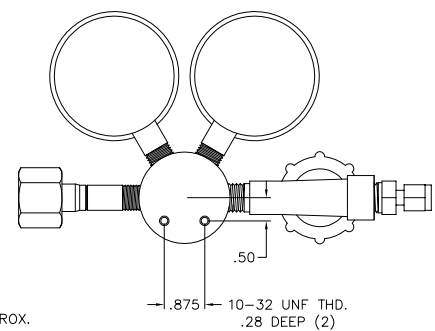
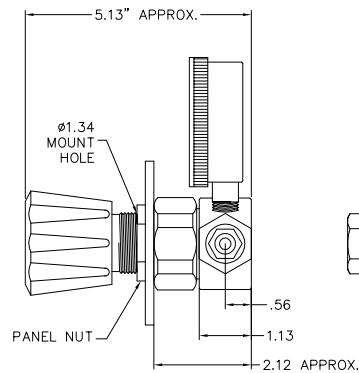
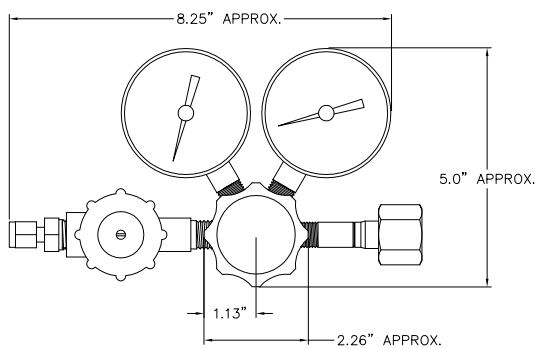
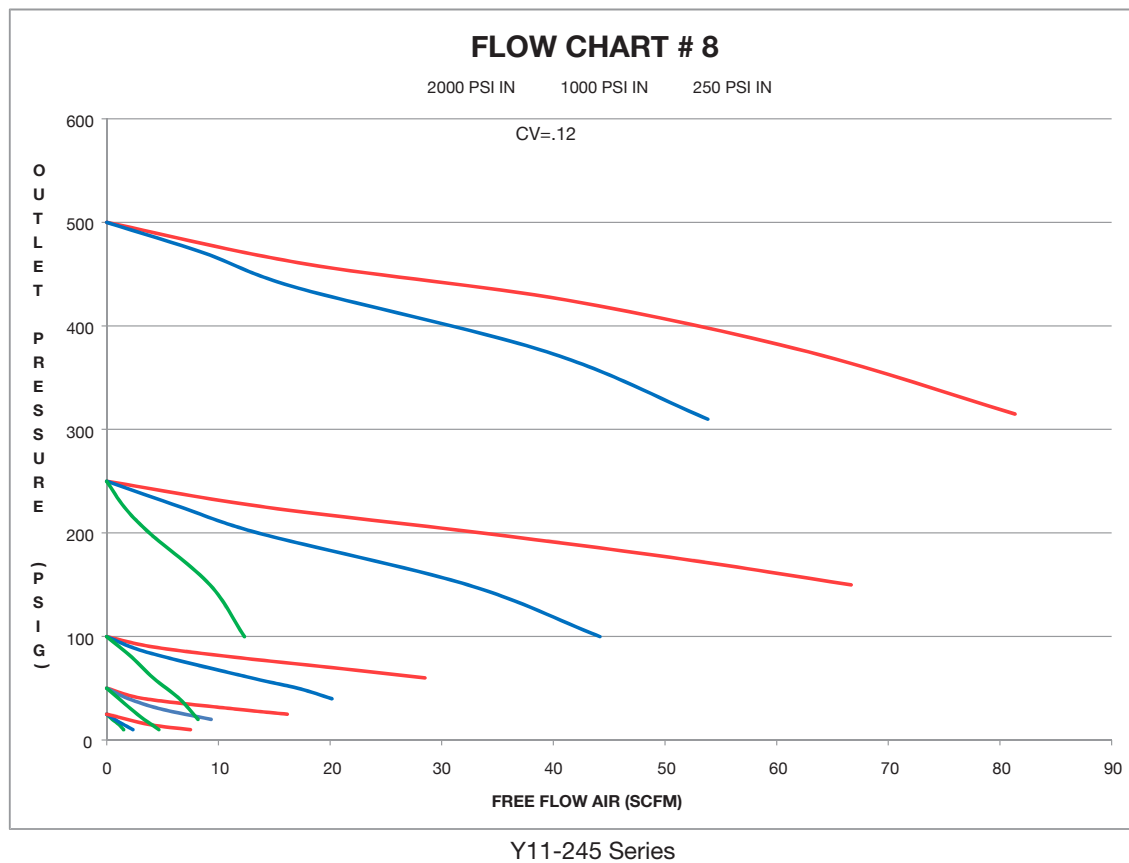
Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-N245A(CGA)	Brass	3,500	25	900	0-4,000	30" Hg-0-30
Y11-N245B(CGA)	Brass	3,500	50	1,250	0-4,000	0-60
Y11-N245D(CGA)	Brass	3,500	100	1,750	0-4,000	0-200
Y11-N245E(CGA)	Brass	3,500	150	2,000	0-4,000	0-200
Y11-N245F(CGA)	Brass	3,500	250	2,700	0-4,000	0-400
Y11-N245G(CGA)	Brass	3,500	500	3,500	0-4,000	0-1,000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders



SINGLE STAGE REGULATOR

PRESSURE REGULATORS

High-Purity



Y12-N245 series

Design Features

Encapsulated Filter Seat Assy

for added gas stream purity and extended service life.

Convuluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Metal to Metal Seal for High Purity

Standard Threaded Bonnet (with optional collar-mount nuts) for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Six Outlet Pressure Ranges

provide application pressure compatibility.

Panel Mount Bonnets

front and rear.

Brass High-Purity Two-Stage Models

Description: This series of two-stage, high-purity regulators is designed for non-corrosive analytical and process applications requiring precise, stable, delivery pressure control. The two-stage design yields a delivery pressure of less than 0.02/100 psi inlet change.

These regulators come with a CGA nipple that has a special high-purity, nonlubricated check valve incorporated into nose and prevents air and contaminants from entering the gas stream during cylinder change out. This creates consistencies in processes and extends column life in GC applications. This regulator also has both a front and rear panel mount bonnet to allow for easy panel mounting.

Convuluted stainless steel diaphragms with metal to metal seals provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents con tamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

A diaphragm packless outlet valve with a 1/4" compression fitting is provided for flow control and to maintain system purity. Captured bonnet ports with optional vent adaptors are standard on both stages and allow for the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonic ally cleaned for the most demanding high-purity service.

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

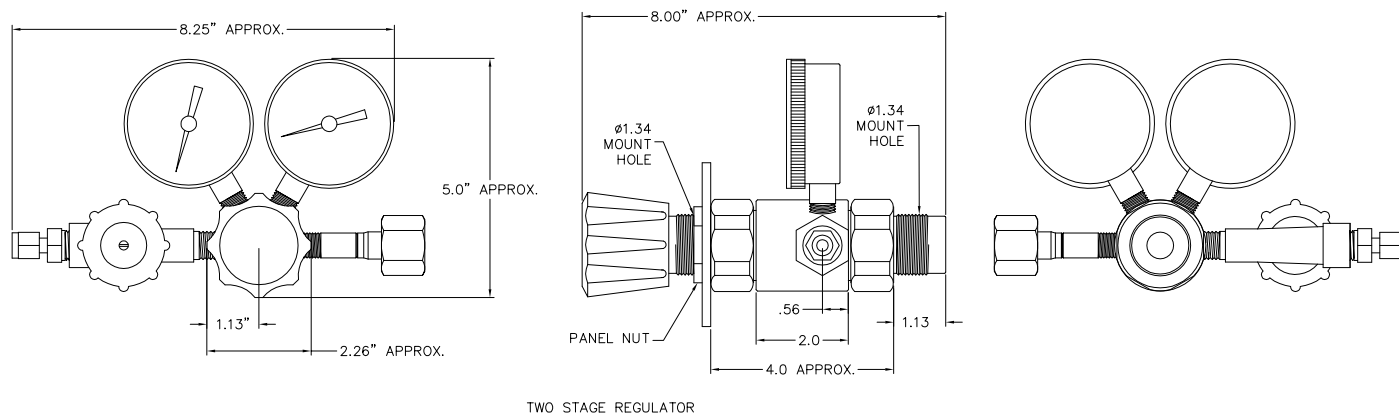
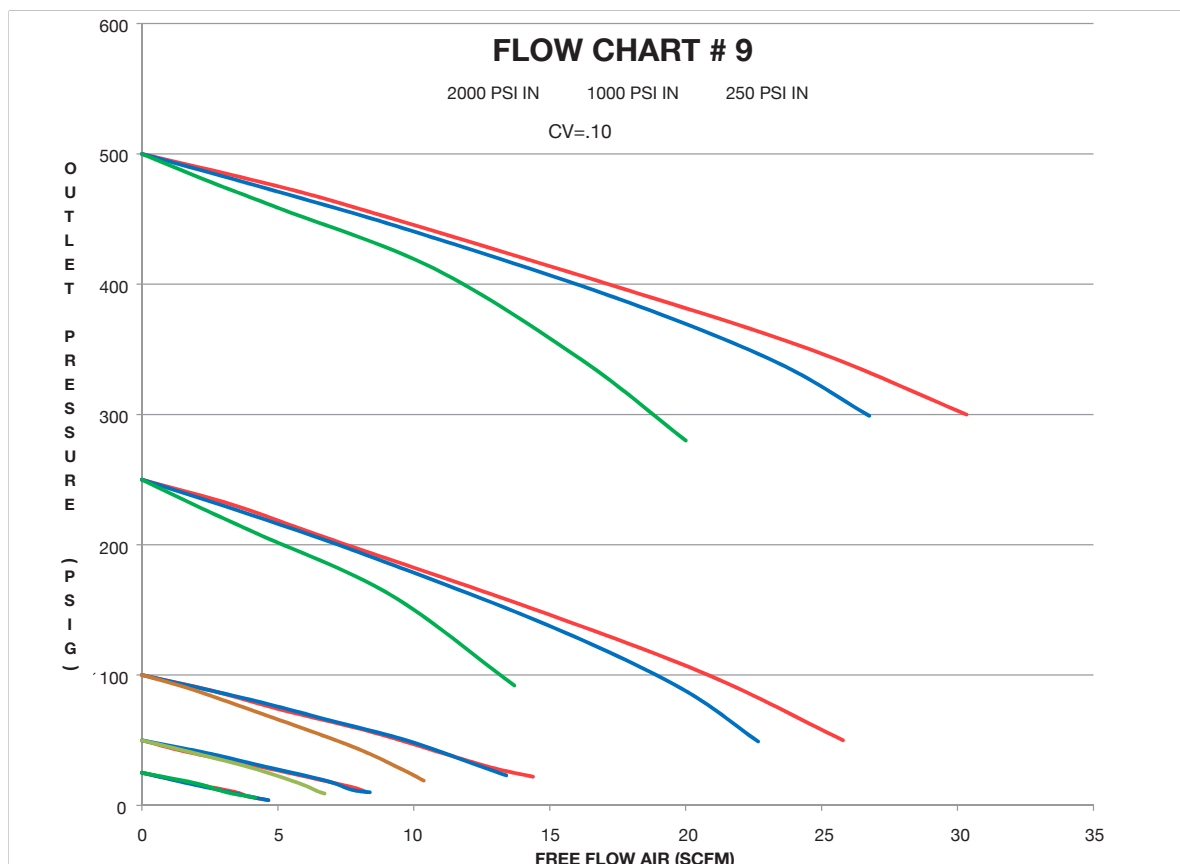
Specifications	
Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-150, 0-250, 0-500 psig
Flow Capacity	Cv = 0.1
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2×10^{-8} ccs (helium)
Weight	5.2 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.02/100 psi

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-N245A(CGA)	Brass	3,500	25	190	0-4,000	30" Hg-0-30
Y12-N245B(CGA)	Brass	3,500	50	270	0-4,000	0-60
Y12-N245D(CGA)	Brass	3,500	100	380	0-4,000	0-200
Y12-N245E(CGA)	Brass	3,500	150	525	0-4,000	0-200
Y12-N245F(CGA)	Brass	3,500	250	850	0-4,000	0-400
Y12-N245G(CGA)	Brass	3,500	500	1000	0-4,000	0-1,000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders



Pressure Regulators – Ultra-High Purity Brass Regulator Series

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Ultra-High Purity Brass Single-Stage Models (Threadless Seat)

Description: The unique design of this regulator provides a continuous sweeping of the high pressure chamber. This design is specifically made for processes using analyzers and mixes gases with low levels of the gas components. This sweeping action prevents any drop out or change in the gas mixture and quickly removes any contaminants that may enter the regulator. These nickel-plated single-stage ultra-high purity regulators are recommended for non-corrosive analytical, mildly corrosive and process applications where precise flow control is not critical. A specially designed, convoluted Hastelloy diaphragm provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination.

These regulators also have a check valve cylinder connection that prevents contaminants from entering during cylinder changeover.

Ultra-High Purity Brass

PRESSURE REGULATORS



Design Features

Convoluted Hastelloy C22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allowing venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting

Diaphragm Packless Valve (with 1/4" TOD compression fitting)

promotes system purity.

Threadless Seat Design

sweeping action ensures gas mixture consistency, provides longer regulator life.

Specifications	
Maximum Rated Inlet Pressure	4000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs.
Ports (6)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" TOD Compression Fitting
Delay Inlet Characteristic	0.06/100 psi

Materials

Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Nickel-Plated Brass
Filter	Copper and Phosphor Bronze
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-T265A(CGA)	Brass	4000	30	900	0-4000	30" Hg-0-30
Y11-T265B(CGA)	Brass	4000	60	1,250	0-4000	0-100
Y11-T265D(CGA)	Brass	4000	100	1,750	0-4000	0-200
Y11-T265F(CGA)	Brass	4000	250	2,700	0-4000	0-400

Available Options

Product Number	Description
Y99-CHROMNUTV	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adapter
Y99-CKCGA	Check Valve Cylinder Connection
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Ultra-High Purity Brass Two-Stage Models (Threadless Seat)

Description: The unique design of this regulator provides a continuous sweeping of the high pressure chamber. This design is specifically made for processes using analyzers and mixes gases with low levels of the gas components. This sweeping action prevents any drop out or change in the gas mixture and quickly removes any contaminants that may enter the regulator. These nickel-plated two-stage ultra-high purity regulators are recommended for non-corrosive analytical, mildly corrosive and process applications where precise flow control is not critical. A specially designed, convoluted Hastelloy diaphragm provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination. This series of nickel-plated brass two-stage high purity regulators is designed for non-corrosive analytical, mildly corrosive and process applications requiring precise, stable delivery pressure control. The two-stage design yields a delivery pressure change of less than 0.01/100 psi inlet change.

These regulators also have a check valve cylinder connection that prevents contaminants from entering during cylinder changeover.

Ultra-High Purity Brass

PRESSURE REGULATORS



Design Features

Convoluted Hastelloy C22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allowing venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting

Diaphragm Packless Valve (with 1/4" TOD Compression Fitting)

promotes system purity.

Threadless Seat Design

sweeping action ensures gas mixture consistency, provides longer regulator life.

Specifications	
Maximum Rated Inlet Pressure	4000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs.
Ports (6)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" TOD Compression Fitting
Delay Inlet Characteristic	0.01/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Nickel-Plated Brass
Filter	Copper and Phosphor Bronze
Outlet Valve	Nickel-Plated Brass
Trim	316 Stainless Steel and Bronze

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-T265A(CGA)	Brass	4000	30	190	0-4000	30" Hg-0-30
Y12-T265B(CGA)	Brass	4000	60	270	0-4000	0-100
Y12-T265D(CGA)	Brass	4000	100	380	0-4000	0-200
Y12-T265F(CGA)	Brass	4000	250	850	0-4000	0-400

Available Options	
Product Number	Description
Y99-CHROMNUTV	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adapter
Y99-CKCGA	Check Valve Cylinder Connection
Y15-QMB1	Quick Mounting Option for 1 Cylinder
Y15-QMB2	Quick Mounting Option for 2 Cylinders

Pressure Regulators – Stainless Steel Regulator Series

Engineering the Right Solutions



Airgas.
You'll find it with us.™

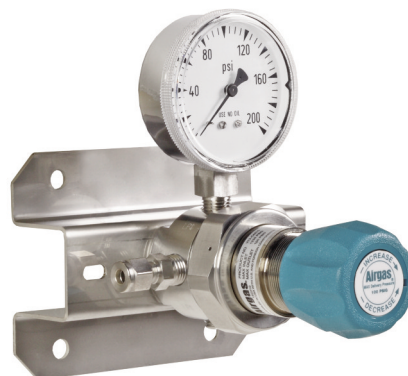
Stainless Steel Line Models (Threadless Seat)

Description: This series of stainless steel high-purity, single-stage line regulators is recommended for applications where diffusion resistance is required. These regulators are recommended for use on low-pressure pipelines serving gas chromatographs, mass spectrometers, research sampling systems, and semiconductor processing.

The specially-designed, convoluted Hastelloy C-22 diaphragm provides accurate, stable delivery pressure and is capable of withstanding internal vacuum purging. These units are easily mounted to panels using the optional panel-mount nuts with the threaded bonnet. Two 10 x 32 UNF-threaded holes in the body allow for bracket or external panel mounting. The optional bonnet vent adaptor allows venting of hazardous gases in the event of diaphragm failure.

High-Purity

PRESSURE REGULATORS



Shown with optional mounting bracket and 1/4" compression fittings

Design Features

Convoluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

High-Flow Capacity

permits excellent pressure control for multi-instrument applications.

Threadless Seat Design

provides longer regulator life.

Specifications	
Maximum Rated Inlet Pressure	1,250 psig
Outlet Pressure Ranges	0-10, 0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.15*
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	2 lbs
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT

*C441AA = CV = 0.06.

Materials

Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauge	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y11-C441AA	316 SS	1,250	10	440	30" Hg-0-30
Y11-C441A	316 SS	1,250	30	600	30" Hg-0-30
Y11-C441B	316 SS	1,250	60	1,080	0-100
Y11-C441C	316 SS	1,250	100	1,140	0-200
Y11-C441F	316 SS	1,250	250	1,750	0-400

Available Options

Product Number	Description
Y99-CHROMNUTV	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y15-418984	Wall Mount Bracket
Y99-26460	1/4" MNPT x 1/4" Compression

PRESSURE REGULATORS

High-Purity



Design Features

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Threadless Seat Design

provides longer regulator life.

Materials

Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	Inconel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-C444AA (CGA)	316 SS	4,000	10	740	0-4,000	30" Hg-0-30
Y11-C444A (CGA)	316 SS	4,000	30	900	0-4,000	30" Hg-0-30
Y11-C444B (CGA)	316 SS	4,000	60	1,250	0-4,000	0-100
Y11-C444D (CGA)	316 SS	4,000	100	1,750	0-4,000	0-200
Y11-C444F (CGA)	316 SS	4,000	250	2,700	0-4,000	0-400
Y11-C444G (CGA)	316 SS	4,000	500	3,700	0-4,000	0-1000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder
Y15-QMS2	Quick Mounting Option for 2 Cylinders

Stainless Steel Single-Stage Models (Threadless Seat)

Description: These stainless steel single-stage high-purity regulators are recommended for non-corrosive analytical, mildly corrosive and process applications where precise flow control is not critical. A specially designed, convoluted Hastelloy C-22 diaphragm provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination.

Each regulator is capable of withstanding an internal vacuum and is provided with a diffusion-resistant, diaphragm packless outlet valve to maintain system purity. The optional bonnet vent adaptor enables venting hazardous gases in the event of diaphragm failure.

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-10, 0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs
Ports (6)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.23/100 psi

Stainless Steel Two-Stage Models (Threadless Seat)

High-Purity

PRESSURE REGULATORS

Description: This series of stainless steel two-stage high-purity regulators is designed for non-corrosive analytical, mildly corrosive and process applications requiring precise, stable delivery pressure control. The two-stage design yields a delivery pressure change of less than 0.01/100 psi inlet change.

Convolute Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

A diaphragm packless outlet valve with a 1/4" compression-tube fitting is provided for flow control and to maintain system purity. Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.



Design Features

Convolute Hastelloy® C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Threadless Seat Design

provides longer regulator life.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-10, 0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs
Ports (6)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-C445AA (CGA)	316 SS	4,000	10	165	0-4,000	30" Hg-0-30
Y12-C445A (CGA)	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y12-C445B (CGA)	316 SS	4,000	60	270	0-4,000	0-100
Y12-C445D (CGA)	316 SS	4,000	100	380	0-4,000	0-200
Y12-C445F (CGA)	316 SS	4,000	250	525	0-4,000	0-400

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder
Y15-QMS2	Quick Mounting Option for 2 Cylinders

PRESSURE REGULATORS

High-Purity



Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-150 psig
Flow Capacity	Cv=0.04
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x 10 ⁻⁸ ccs (helium)
Weight	4 lbs
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	1.17/100 psi

Materials

Body	316 Stainless Steel
Friction Sleeve	PTFE
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel Continuous Wire
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel

Single-Stage Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-E444A(CGA)	316 SS	3,500	0-30	875	0-4,000	30"-0-30
Y11-E444B(CGA)	316 SS	3,500	0-60	1,860	0-4,000	0-100
Y11-E444C(CGA)	316 SS	3,500	0-100	2,880	0-4,000	0-200
Y11-E444D(CGA)	316 SS	3,500	0-150	3,000	0-4,000	0-200
*Y11-E464A(CGA)	316 SS	3,500	0-30	875	0-4,000	30"-0-30
*Y11-E464B(CGA)	316 SS	3,500	0-60	1,860	0-4,000	0-60
*Y11-E464C(CGA)	316 SS	3,500	0-100	2,880	0-4,000	0-200
*Y11-E464E(CGA)	316 SS	3,500	0-150	3,000	0-4,000	0-200

* This unit incorporates a Hastelloy® C-22 stem and seat retainer and an Inconel® spring and Hastelloy C-22 diaphragm.

Stainless Steel Positive-Seal Models

These single- and two-stage positive-seal regulators feature convoluted, Hastelloy C-22 diaphragms that provide maximum sensitivity, minimum droop and a leak-tight bonnet seal. Type 316 stainless steel internal components are ultra-sonically cleaned and electropolished to a 32-Ra surface finish for applications where a contamination-free flow stream is critical. Optional 15 Ra electropolished with face seal.

A rugged, mechanical linkage connecting the diaphragm and valve stem significantly reduces the possibility of pressure creep. A PCTFE seat provides positive closure and is compatible with a wide range of mildly corrosive or corrosive gases.

Each single-stage positive-seal regulator is designed with two 10 x 32 UNF-threaded body holes for bracket or panel mounting.

Design Features

Tied, Convoluted Diaphragm Design

provides positive shutoff and minimizes creep.

Ultrasonic Cleansing and Electropolishing to a 32-Ra Surface Finish

allows high-purity integrity and contamination-free flow stream. (15 Ra electropolished surface is optional with face seal connections - not available with NPT or compression)

Large, Hastelloy C22 Convoluted Diaphragm

provides maximum sensitivity, minimum droop, and a leak-tight bonnet seal without the use of a contaminating soft seal.

PCTFE Seat

permits positive seat closure and provides wide media compatibility range.

Diaphragm Packless Valve (with standard 1/4" Compression fitting)

permits positive shutoff and flow control.

Optional Porting (consult Airgas)

for special port configurations: butt-welded, zero-clearance fittings (VCR®, Vaculok®, UltraSeal®, etc.) or space saving, internally machined, high-purity porting compatible with fitting styles mentioned above.

PRESSURE REGULATORS

High-Purity

Stainless Steel Positive-Seal Models
Cont.

Two-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-E444A(CGA)	316 SS	3,500	0-30	200	0-4,000	30"-0-30
Y12-E444B(CGA)	316 SS	3,500	0-60	250	0-4,000	0-100
Y12-E444D(CGA)	316 SS	3,500	0-100	300	0-4,000	0-200

Available Options		
Product Number	Description	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Stainless Steel Two-Stage Models (Threaded Seat)

Description: This series of two-stage, high-purity stainless steel regulators is designed for non-corrosive analytical and process applications requiring precise, stable delivery pressure control. The two-stage design yields a delivery pressure change of less than 0.04/100 psi inlet change.

Convoluted stainless steel diaphragms provide excellent regulating characteristics and corrosion resistance, and the threaded-seat design allows for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

A diaphragm packless outlet valve with a 1/4" compression fitting is provided for flow control and to maintain system purity. Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

High-Purity

PRESSURE REGULATORS



Design Features

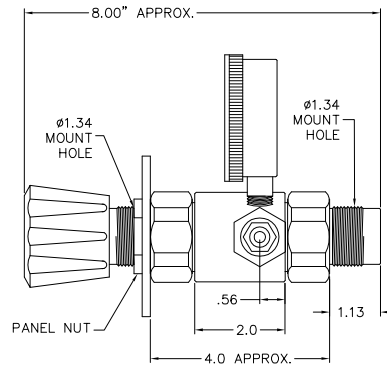
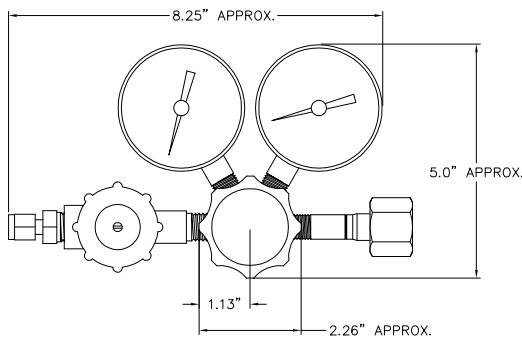
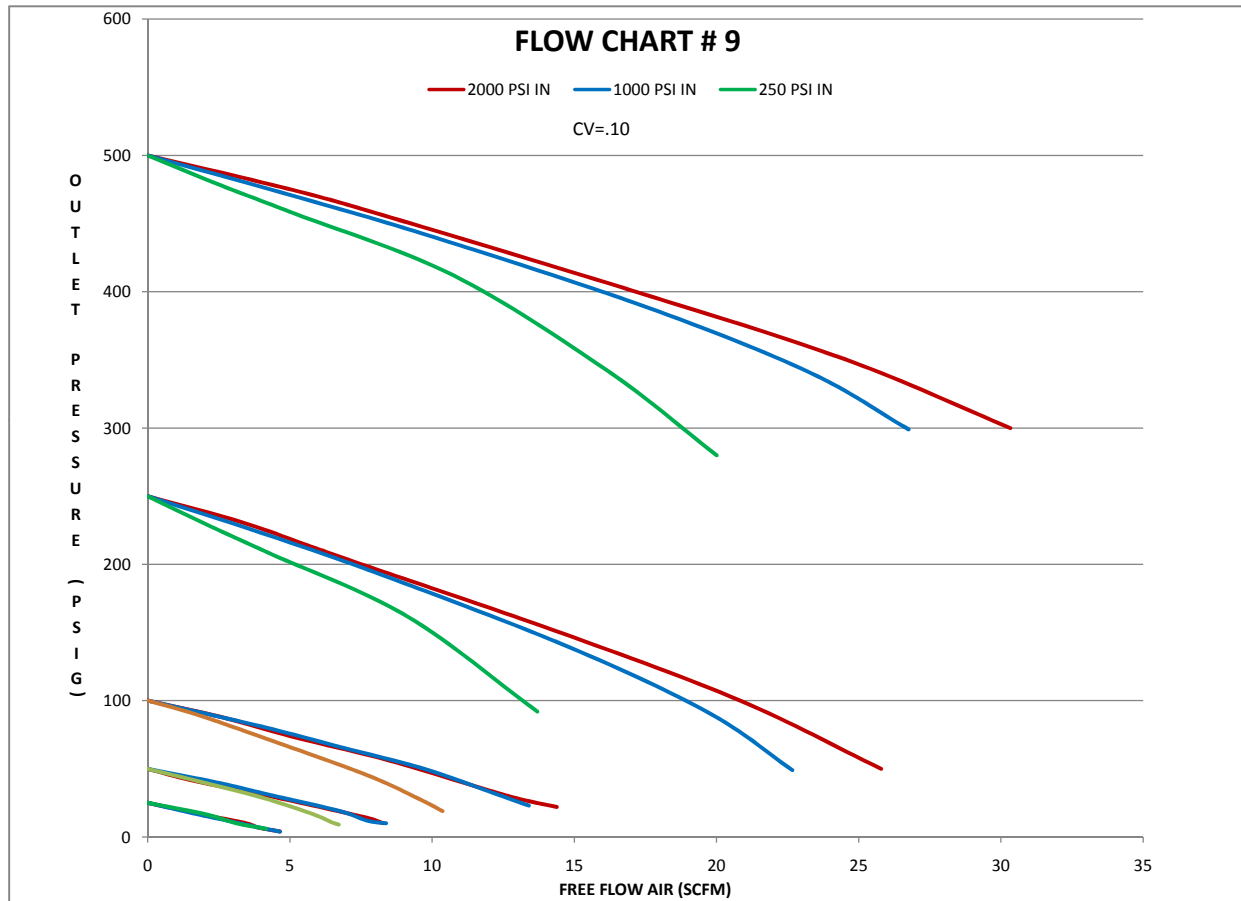
- Filtered Seat** for added gas stream purity and extended service life.
- Convoluted Stainless Steel Diaphragms** provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports** (with optional bonnet vent adaptors) allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet** (with optional collar-mount nuts) for easy panel mounting.
- Diaphragm Packless Valve** (with 1/4" Compression fitting) promotes system purity.
- Four Outlet Pressure Ranges** provide application pressure compatibility.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-500 psig
Flow Capacity	Cv=0.05
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2×10^{-8} ccs (helium)
Weight	4 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.04/100 psi

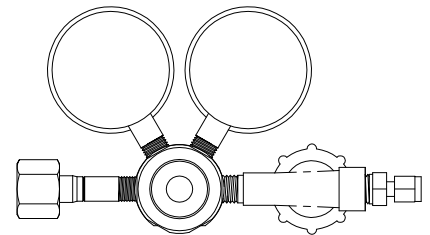
Materials	
Body	316 Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel Continuous Wire
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-C645A (CGA)	316 SS	3,000	25	190	0-4,000	30" Hg-0-30
Y12-C645B (CGA)	316 SS	3,000	50	270	0-4,000	0-60
Y12-C645D (CGA)	316 SS	3,000	100	380	0-4,000	0-200
Y12-C645F (CGA)	316 SS	3,000	250	850	0-4,000	0-400
Y12-C645G (CGA)	316 SS	3,000	500	1,000	0-4,000	0-600

Available Options	
Product Number	Description
Y99-CHROMNUTS	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)



TWO STAGE REGULATOR



PRESSURE REGULATORS

High-Purity

High-Purity Absolute Pressure



Description: This absolute pressure regulator is capable of accepting a line pressure of atmospheric to 250 psig and reducing it to within sub-atmospheric to 10 psig. This regulator is designed for high-purity gas systems and systems which handle highly corrosive media. Only Hastelloy C-22 and PTFE material are in contact with the flow media.

This regulator utilizes a soft-seated main valve for tight shutoff in dead-end applications and a metal diaphragm sensing element for enhanced pressure-control sensitivity.

Design Features

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Standard Threaded Bonnet (with optional collar-mount nuts) for easy panel mounting.

Electropolishing and Ultrasonic Cleaning

allows high-purity gas handling without costly pre-cleaning.

Specifications	
Maximum Rated Inlet Pressure	Atmospheric to 250 psig
Outlet Pressure Ranges	28" Hg vacuum to 10 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-65° F to +165° F
Designed Leak Rate	2 x10 ⁻⁸ ccs (helium)
Weight	3 lbs
Ports (3)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT

Materials	
Body	316L Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel Continuous Wire
Valve Stem	316 Stainless Steel
Valve Spring	Inconel
Trim	Stainless Steel

Ordering Information					
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)
Y11-C440N	316 SS	250	10	210	30" HG-0-30

Available Options	
Product Number	Description
Y15-418984	Wall-Mount Bracket
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-CHROMNUT	Panel Mounting Nut (2 required)
Y99-26460	1/4" MNPT x 1/4" Compression

Pressure Regulators- Ultra-High Purity Stainless Steel Regulator Series

Pressure Regulators – Ultra-High Purity Stainless Steel Regulator Series

Specialty Gases and Equipment Product Reference Guide

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PRESSURE REGULATORS

Ultra High-Purity



Design Features

Packless diaphragm valve built into the body

Unique internal design sweeps diaphragm cavity

Check valve CGA

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)
for easy panel mounting.

Diaphragm Packless Valve (with 1/8" Compression fitting)
promotes system purity.

Threadless Seat Design
provides longer regulator life.

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat)

Description: This series of stainless steel single-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process faster and without contamination. This is an excellent regulator for EPA protocol gas mixtures, as well as other mixes used in high purity applications.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Materials	
Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	Inconel

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.23/100 psi

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat) **Cont.**

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-CHP444A(CGA)	316 SS	4,000	30	190	0 - 4,000	30Hg - 0 - 30
Y11-CHP444B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y11-CHP444D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y11-CHP444F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400
Y11-CHP444G(CGA)	316 SS	4,000	500	985	0 - 4,000	0 - 1,000

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat)

Description: This series of stainless steel two-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process more quickly and without contamination. This makes it an excellent regulator for EPA protocol gas mixtures, as well as other high purity applications.

The two-stage design provides a constant delivery pressure and the supply inlet effect that causes the outlet pressure to change as the inlet pressure drops is less than .01/100 psi of inlet pressure change.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-6} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Ultra High-Purity

PRESSURE REGULATORS



Design Features

- Packless diaphragm valve built into the body**
- Unique internal design sweeps diaphragm cavity**
- Check valve CGA**
- Convuluted Hastelloy® C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports** (with optional bonnet vent adaptors)
allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet** (with optional collar-mount nuts)
for easy panel mounting.
- Diaphragm Packless Valve** (with 1/8" Compression fitting)
promotes system purity.
- Threadless Seat Design**
provides longer regulator life.

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat) Cont.

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-CHP445A(CGA)	316 SS	4,000	30	190	0 - 4,000	30 Hg - 0 - 30
Y12-CHP445B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y12-CHP445D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y12-CHP445F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Pressure Regulators- Nanotech/Semiconductor Regulator Series

Pressure Regulators – Nanotech/Semiconductor Regulator Series

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Ultra-High-Purity Line

Electronic Service

PRESSURE REGULATORS

Description: The Airgas® Ultra High-Purity Line Regulators are an internally threadless pressure regulator and are specifically designed for instrument/analyzer and semiconductor applications. This line regulator's unique carrier design disperses gas uniformly through the regulator to improve purging. The regulator seat material meets the requirements for corrosive and inert gases.

These regulators are all orbitally welded with high-purity face seal connections and have a 32 Ra internal surface finish. Optional 10 Ra electropolished.

Instrument applications include gas management systems in petrochemical/refineries and process analyzer systems. Semiconductor applications include general-purpose gas management (air, condensed dry air (CDA), and plant nitrogen).

This regulator is a high-pressure ultra-high-purity line regulator. It is used at the process point or inline.



Design Features

32 Ra Internal Surface Finish

Unique Patented Compression Member

loads the seal to the body without requiring a threaded nozzle or additional seal to atmosphere.

Meets NACE Standard MR0175

Captured Bonnet

allows for safety venting.

Specifications	
Max Rated Inlet Pressure	4,000 psig (2.76 bar)
Outlet Pressure Range	2-25, 3-60, 4-100, 5-250 psig
Cv	0.06
Ambient Operating Temperature	-40° F to 150° F (-38° C to 65° C)
Designed Leak Rate	2 x 10 ⁻⁸ scc/sec (helium)
Weight	1.5 lbs (0.7 kg)
Ports	3 - 1/4" Face Seal
Inlet	1/4" Female Face Seal
Outlet	1/4" Male Face Seal
Gauge Ports	1/4" Male Face Seal
Gauge Size	2" diameter
Supply Pressure Effect	0.1/100 psi

Materials	
Body	316L Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy® C-22
Gauges	2" Female Face Seal
Filter	None
Seals	PTFE
Poppet	Elgloy®
Poppet Spring	Iconel®
Carrier	Stainless Steel
Back-up washer	316L Stainless Steel
Back-up O-ring	FKM

Ordering Information				
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Outlet Gauge Range (psig)
Y11-HP980A	316L Stainless Steel	4,000	30	0-60
Y11-HP980B	316L Stainless Steel	4,000	60	0-100
Y11-HP980D	316L Stainless Steel	4,000	100	0-200
Y11-HP980F	316L Stainless Steel	4,000	250	0-400

PRESSURE REGULATORS

Electronic Service



Design Features

32 Ra Internal Surface Finish

Unique Patented Compression Member

loads the seal to the body without requiring a threaded nozzle or additional seal to atmosphere.

Meets NACE Standard MR0175

Captured Bonnet

allows for safety venting.

Ultra-High-Purity Single-Stage

Description: The Airgas® Model 900 Ultra-High-Purity Single-Stage Regulators are internally threadless pressure regulator specifically designed for instrument/analyzer and semiconductor applications. This regulator's unique carrier design disperses gas uniformly through the regulator to improve purging. The seat material meets the requirements for corrosive and inert gases.

These regulators are all orbitally welded with high-purity face seal connections and have a 32 Ra internal surface finish. Optional 10 Ra electropolished.

Instrument applications include gas management systems in petrochemical/refineries and process analyzer systems. Semiconductor applications include general-purpose gas management (air, condensed dry air (CDA), and plant nitrogen).

This regulator is a high-pressure ultra-high-purity regulator.

Specifications

Max Rated Inlet Pressure	4,000 psig (2.76 bar)
Outlet Pressure Range	1-30, 2-60, 3-100, 10-250 psig
Cv	0.06
Ambient Operating Temperature	-40° F to 150° F (-38° C to 65° C)
Designed Leak Rate	2 x 10 ⁻⁸ scc/sec (helium)
Weight	1.5 lbs (0.7 kg)
Ports	1/4" Face Seal
Inlet	1/4" Female Face Seal
Outlet	1/4" Male Face Seal
Gauge Ports	1/4" Male Face Seal
Gauge Size	2" diameter
Supply Pressure Effect	0.6/100 psi

Materials

Body	316L Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22®
Gauges	2" Female Face Seal
Filter	None
Seals	PTFE
Poppet	Elgloy®
Poppet Spring	Iconel®
Carrier	Stainless Steel
Back-up washer	316L Stainless Steel
Back-up O-ring	KFM

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Inlet Gauge Range (psig)	Outlet Gauge Range (psig)
Y11-HP900A(CGA)	316L Stainless Steel	4,000	30	0-4,000	0-60
Y11-HP900B(CGA)	316L Stainless Steel	4,000	60	0-4,000	0-100
Y11-HP900D(CGA)	316L Stainless Steel	4,000	100	0-4,000	0-200
Y11-HP900F(CGA)	316L Stainless Steel	4,000	250	0-4,000	0-400

Ultra-High-Purity Two-Stage

Electronic Service

PRESSURE REGULATORS

Description: The Airgas® Ultra-High-Purity Two Stage Regulators are internally threadless pressure regulators specifically designed for instrument/analyzer and semiconductor applications. This regulator's unique carrier design disperses gas uniformly through the regulator to improve purging. The seat materials meet the requirements for corrosive and inert gases.

These regulators are all orbitally welded with high-purity face seal connections and have a 32 Ra internal surface finish. Optional 10 Ra electropolished.

Instrument applications include gas management systems in petrochemical/refineries and process analyzer systems. Semiconductor applications include general-purpose gas management (air, condensed dry air (CDA), and plant nitrogen).

This is a high-pressure ultra-high-purity regulator.



Design Features

32 Ra Internal Surface Finish

Unique Patented Compression Member

loads the seal to the body without requiring a threaded nozzle or additional seal to atmosphere.

Meets NACE Standard MR0175

Captured Bonnet

allows for safety venting.

Specifications	
Max Rated Inlet Pressure	4,000 psig (276 bar)
Outlet Pressure Range	1–30, 2–60, 3–100, 10–250 psig
Cv	0.06
Ambient Operating Temperature	–40° F to 150° F (–38° C to 65° C)
Designed Leak Rate	2 x 10 ⁻⁸ scc/sec (helium)
Weight	1.5 lbs (0.7 kg)
Ports	1/4" Face Seal
Inlet	1/4" Female Face Seal
Outlet	1/4" Male Face Seal
Gauge Ports	1/4" Male Face Seal
Gauge Size	2" diameter
Supply Pressure Effect	0.6/100 psi

Materials	
Body	316L Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22®
Gauges	2" Female Face Seal
Filter	None
Seals	PTFE
Poppet	Elgilloy®
Poppet Spring	Iconel®
Carrier	Stainless Steel
Back-up washer	316L Stainless Steel
Back-up O-ring	FKM

Ordering Information					
Product Number	Body Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Inlet Gauge Range (psig)	Outlet Gauge Range (psig)
Y12-HP950A(CGA)	316L Stainless Steel	4,000	25	0–4,000	0–60
Y12-HP950B(CGA)	316L Stainless Steel	4,000	60	0–4,000	0–100
Y12-HP950D(CGA)	316L Stainless Steel	4,000	100	0–4,000	0–200
Y12-HP950F(CGA)	316L Stainless Steel	4,000	250	0–4,000	0–400

Specialty High Purity Regulators – Pressure Regulators –

Engineering the Right Solutions



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Low-Flow Two-Stage Models

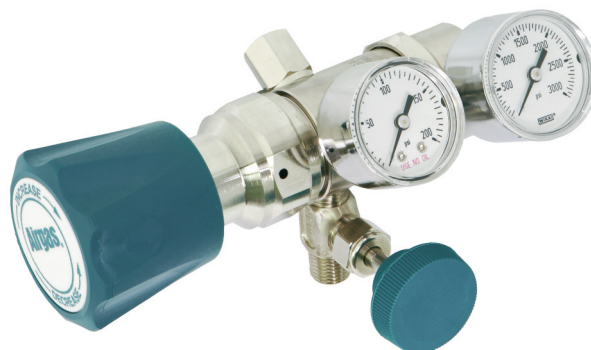
High-Purity

PRESSURE REGULATORS

Description: These two-stage regulators are specifically designed for low-flow, non-corrosive gas applications where precise delivery pressure is critical. They feature a brass piston sensor in the first stage, a stainless steel diaphragm in the second stage and a preset safety relief valve. A sintered brass filter protects internal parts.

These two-stage regulators are also ideal for medical diagnostic applications, such as blood gas analysis, where precise pressure control and low flow rates are required.

They are available with a CGA cylinder valve connection for use on large cylinders, or a 973 pin-indexed yoke connection for use with E medical cylinders.



Design Features

Convolute Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Low Internal Volume

allows rapid purging and stabilization of gas flow.

Low-Flow Design

provides precise pressure and flow control.

Small Size

enables fast, easy fit up.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-10, 0-50, 0-100 psig
Flow Capacity	Cv=0.088
Ambient Operating Temperature	-20° F to +140° F
Designed Leak Rate	1 x10 ⁻⁴ ccs (helium)
Weight	3 lbs
Ports (4)	1/8" FNPT and 1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.026/100 psi

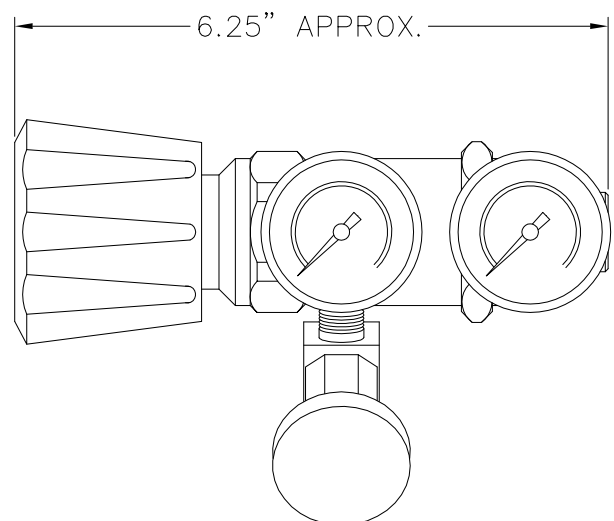
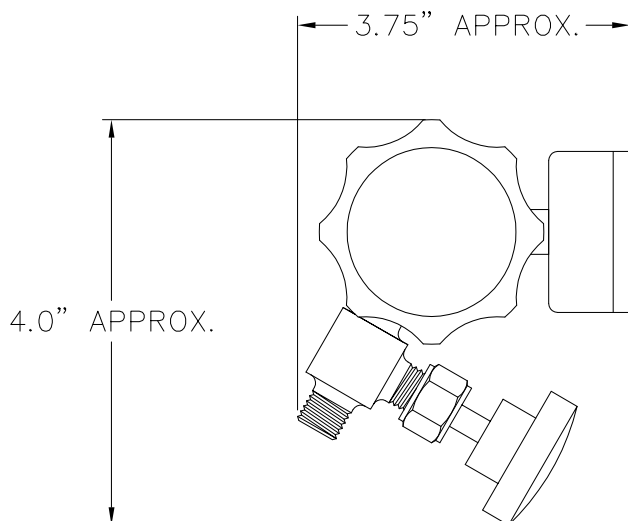
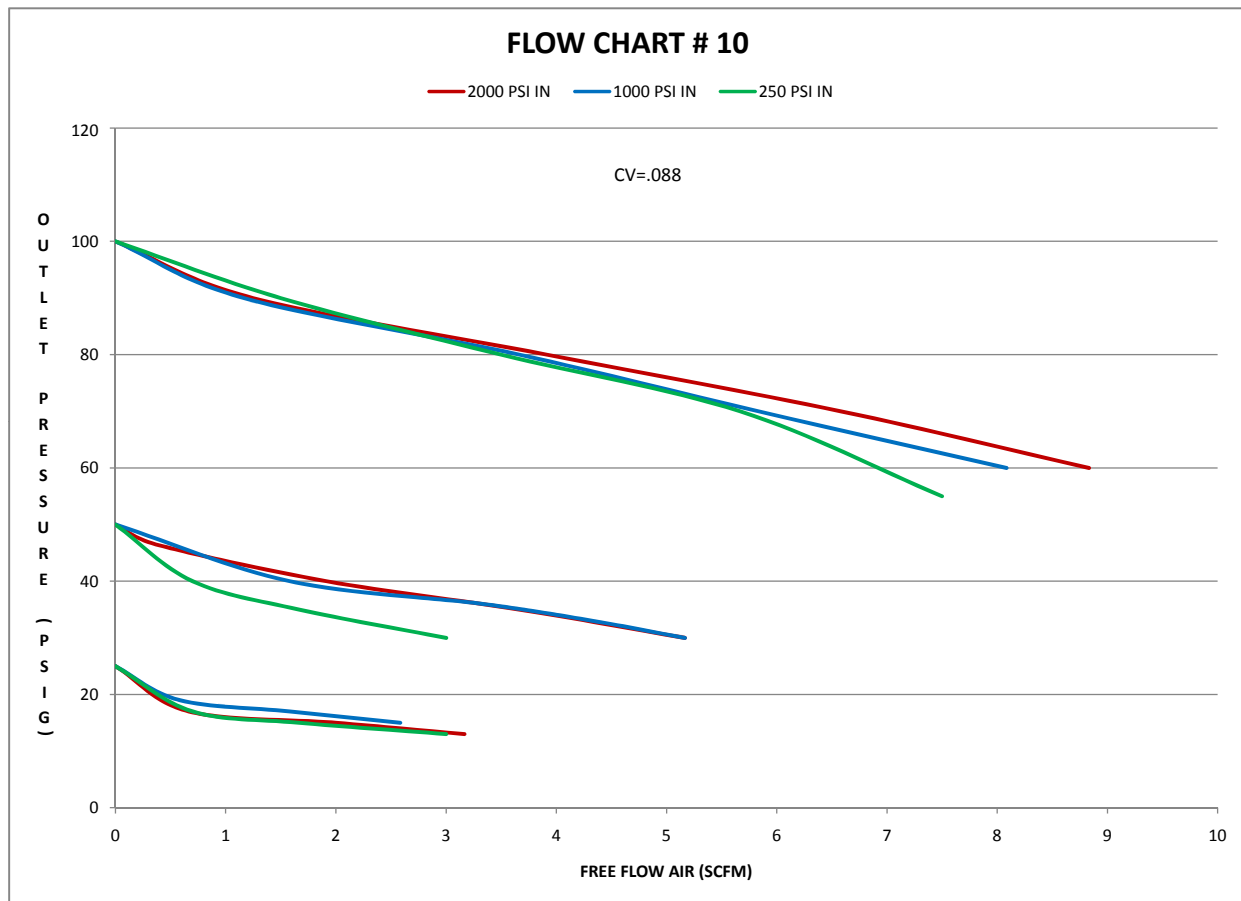
Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE and Viton-A®
Diaphragm	304 Stainless Steel
Gauges	1 1/2" Nickel-Plated Brass
Filter	Sintered Brass
Piston	Brass
Piston O-Ring	Viton-A®
Outlet Valve	Nickel-Plated Brass
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-C144A(CGA)	Brass	3,000	10	10	350	0-3,000	0-15
Y12-C144B(CGA)	Brass	3,000	50	25	350	0-3,000	0-100
Y12-C144D(CGA)	Brass	3,000	100	50	350	0-3,000	0-160
*Y12-M350 (Medical)	Brass	3,000	50	25	350	0-3,000	0-100
*Y12-M500 (Medical)	Brass	3,000	50	25	350	0-3,000	0-100
*Y12-M973 (Medical)	Brass	3,000	50	25	350	0-3,000	0-100

*Not to be used for human consumption or ingestion.

Available Options		Additional Information:
Product Number	Description	
Y99-26120	1/4" FNPT x 1/4" Compression	
Y99-26140	1/4" FNPT x 1/8" Compression	
		Compact size allows for easy fit-up and connection to process equipment.



PRESSURE REGULATORS

High-Purity



Y11-N145DHF



Y11-N140EHF

High-Flow Models

Description: This series of regulators is used for applications requiring high gas flow rates and a compact design. These regulators can handle flows up to 250 liters per minute of nitrogen with only a 5 psig pressure drop. In addition, these units will handle hydrogen flow up to 1,000 liters per minute without the resonance problems associated with other regulators in this same application.

Design Features

Stainless Steel Diaphragm

provides precise pressure control and superior leak integrity.

Cv Flow Coefficient = 1.0

permits high flows with minimum pressure drop.

Stabilizer Springs

eliminate regulator resonance.

Materials

Body	Brass or Stainless Steel
Bonnet	Chrome-plated die cast Zinc
Seat	PCTFE
Diaphragm	Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass or Stainless Steel
Valve Stem	PTFE
Valve Spring	Nickel-Plated Brass
Trim	Nickel-Plated Brass or Stainless Steel

Specifications

Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-15, 0-40, 0-120, 0-200, 0-250 psig
Flow Capacity	Cv=1.0
Ambient Operating Temperature	-40° F to +140° F
Designed Leak Rate	1 x10 ⁻⁸ ccs (helium)
Weight	5.8-lbs
Gauge Port(s)	1/4" FNPT
Inlet	1/2" FNPT
Outlet	1/2" FNPT

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-N140AHF	Brass	3000	15	2400	N/A	0-30
Y11-N140BHF	Brass	3000	40	4200	N/A	0-60
Y11-N140DHF	Brass	3000	120	7200	N/A	0-200
Y11-N140EHF	Brass	3000	200	9000	N/A	0-400
Y11-N140FHF	Brass	3000	250	9000	N/A	0-400
Y11-N145AHF	Brass	3000	15	2400	0-4000	0-30
Y11-N145BHF	Brass	3000	40	4200	0-4000	0-60
Y11-N145DHF	Brass	3000	120	7200	0-4000	0-200
Y11-N145EHF	Brass	3000	200	9000	0-4000	0-400
Y11-N145FHF	Brass	3000	250	9000	0-4000	0-400

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-C440AHF	SS	3000	15	2400	N/A	0-30
Y11-C440BHF	SS	3000	40	4200	N/A	0-60
Y11-C440CHF	SS	3000	120	7200	N/A	0-200
Y11-C440DHF	SS	3000	200	9000	N/A	0-400
Y11-C440FHF	SS	3000	250	9000	N/A	0-400
Y11-C445AHF	SS	3000	15	2400	0-4000	0-30
Y11-C445BHF	SS	3000	40	4200	0-4000	0-60
Y11-C445DHF	SS	3000	120	7200	0-4000	0-200
Y11-C445EHF	SS	3000	200	9000	0-4000	0-400
Y11-C445FHF	SS	3000	250	9000	0-4000	0-400

High Pressure High Flow Regulator

Description: The Airgas high pressure high flow regulator is a diaphragm type regulator that can provide up to 60 SCFM of nitrogen at 4350 psig inlet pressure and 725 psig outlet pressure. This regulator's balance valve technology design is ideal for high purity gases high flow and high pressure applications that require precise delivery pressures.

Specifications	
Maximum Inlet Pressure	4350 psig
Outlet Pressure Range	0-145; 0-230; 0-360; 0-725 psig
Flow Capacity	Cv = 0.25
Ambient Operating Temperature Range	-4°F to 140°F
Weight	5.5 lbs
Inlet / Outlet Ports	1/4" NPT Female
Gauge Ports	1/4" NPT Female
Design Leak Rate	1 x 10 ⁻⁸ ccs (helium)
Decay inlet Characteristic	0.52 / 100 psi

Materials	
Body	Chrome Plated Brass/316 Stainless Steel
Bonnet	Chrome Plated Brass
Seat	PCTFE
Diaphragm	AlSi304 & Hastelloy
O-Rings	EPDM
Gauges	Chrome Plated Brass/Stainless Steel
Filter	Chrome Plated Brass/Stainless Steel

Single-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Flow Capacity (scfm)	Inlet Gauge (psig)	Delivery Gauge (psig)
Y11-RHF1A	Brass	4350	145	30	5800	200
Y11-RHF1B	Brass	4350	230	30	5800	350
Y11-RHF1C	Brass	4350	360	30	5800	590
Y11-RHF1D	Brass	4350	725	60	5800	1400
Y11-RHF4A	316 Stainless Steel	4350	145	30	5800	200
Y11-RHF4B	316 Stainless Steel	4350	230	30	5800	350
Y11-RHF4C	316 Stainless Steel	4350	360	30	5800	590
Y11-RHF4D	316 Stainless Steel	4350	725	60	5800	1400

High Pressure High Flow Regulator

REGULATORS



Design Features

- Balance valve technology ensures a constant downstream pressure when the inlet pressure is changing
- Easy rotating handknob provides fast low-torque pressure setting
- Rear threads for front panel mount

Single-Stage Mini Regulator Models

Description: These compact, single-stage general-purpose and analytical series regulators are ideally suited for lecture bottles and other small cylinders. They are equipped with a CGA 180 connection for easy attachment to Airgas® lecture bottles. Other CGA connections (110 or 170 CGA's) are available upon request.

Rated to 3,000 psig, these regulators feature a built-in, non-lubricated needle valve that has been designed to regulate outlet flow. Choose a brass model for non-analytical, non-corrosive service; an aluminum model for mildly corrosive service or a stainless steel model for corrosive service.

High-Purity

PRESSURE REGULATORS



Design Features

Compact Design
is ideal for lecture bottles and small cylinders.

Sensitive Diaphragm
provides accurate pressure settings.

1½" or 2" Gauges
are easy to read at a glance.

Large Adjusting Knob
provides excellent sensitivity over a wide range of settings.

Needle Valve
provides easy control of flow volume.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-25, 0-60, 0-100 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	1.5 lbs
Ports (3)	1/8" FNPT
Inlet	1/8" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.58/100 psi

Materials	
Body	Nickel-Plated Brass, Aluminum, or Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	Neoprene or 316 Stainless Steel
Gauges	1½" Nickel-Plated Brass or 2" Stainless Steel
Filter	316 Stainless Steel
Valve Spring	316 Stainless Steel
Valve Stem	316 Stainless Steel
Trim	Nickel-Plated Brass or Stainless Steel

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-L215ALB (CGA)	Brass*	3,000	25	300	0-3,000	0-30
Y11-L215DLB (CGA)	Brass*	3,000	60	1,050	0-3,000	0-100
Y11-L244ALB (CGA)	Brass**	3,000	25	300	0-3,000	0-30
Y11-L244DLB (CGA)	Brass**	3,000	60	1,050	0-3,000	0-100
Y11-L545A (CGA)	Aluminum**	3,000	25	90	0-3,000	0-30
Y11-L545D (CGA)	Aluminum**	3,000	100	250	0-3,000	0-100
Y11-L445A (CGA)	316 SS**	3,000	25	90	0-3,000	0-30
Y11-L445D (CGA)	316 SS**	3,000	100	250	0-3,000	0-100

* Neoprene diaphragm

** Stainless steel diaphragm

PRESSURE REGULATORS

High-Purity



Design Features

Compact Design

ideal for lecture bottles and small cylinders.

Sensitive Diaphragm

provides accurate pressure settings.

1 1/2" Gauges

permit easy reading.

Large Adjusting Knob

provides excellent sensitivity over a wide range of settings.

Needle Valve

provides easy control of flow volume.

Two-Stage Mini Regulator Models

Description: These compact, two-stage analytical series and high-purity stainless steel regulators are ideally suited for lecture bottles and other small cylinders. They are equipped with a CGA 180 connection for easy attachment to Airgas® lecture bottles. Other CGA connections are available upon request, as the regulator is rated for 3,000 psig inlet pressure.

This regulator also features a non-lubricated needle valve, designed to regulate outlet flow. Choose a brass model for analytical or non-corrosive service or a stainless steel model for mildly corrosive service. If used in corrosive service, a cross-purge assembly must be used.

Specifications

Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-25, 0-100 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to 165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	1.5 lbs
Ports	1/8" FNPT
Inlet	CGA x 1/8" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.58/100 psi

Materials

Body	Nickel-Plated Brass, Aluminum, or Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	1 1/2" Nickel-Plated Brass or Stainless Steel (plastic case)
Filter	316 Stainless Steel
Valve Spring	316 Stainless Steel
Valve Stem	316 Stainless Steel
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-L244ALB	Brass	3,000	25	300	75	0-3,000	0-30
Y12-L244DLB	Brass	3,000	100	1,050	210	0-3,000	0-100
Y12-L445ALB	316 SS	3,000	25	90	75	0-3,000	0-30
Y12-L445DLB	316 SS	3,000	100	250	250	0-3,000	0-100

High-Purity Back-Pressure

Description: These back-pressure regulators control the inlet pressure rather than outlet pressure. They are very similar to relief valves in operation and are actually used as relief valves in many applications requiring high sensitivity and close tolerances on crack/reseat pressure relationships. This compact series of regulators is hand-adjustable and spring-loaded. A diaphragm sensor provides precise pressure control.

High-Purity

PRESSURE REGULATORS



Design Features

Convuluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Specifications	
Maximum Rated Inlet Pressure	250 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-65° F to +165° F
Designed Leak Rate	1 x10 ⁻⁴ ccs (helium)
Weight	2 lbs
Ports (2)	1/4" FNPT

Materials	
Body	Nickel-Plated Brass or 316L Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316 Stainless Steel

Ordering Information		
Product Number	Control Pressure Range (psig)	Material
Y11-BP125	0-25	Brass
Y11-BP150	0-50	Brass
Y11-BP1250	0-250	Brass
Y11-BP425	0-25	316 SS
Y11-BP450	0-50	316 SS
Y11-BP4100	0-100	316 SS
Y11-BP4250	0-250	316 SS

	Available Options	
	Product Number	Description
	Y99-BONNET ADP	Bonnet Vent Adaptor
	Y99-CHROMNUT	Panel Mounting Nut (2 required)
	Y99-26460	1/4" MNPT x 1/4" Compression

Brass Pipeline Regulator

This brass bar stock pipeline regulator is recommended for applications requiring high flow and diffusion resistant pressure regulation. The brass construction and stainless steel diaphragm protects gas purity and ensures long regulator service life when used with non-corrosive gases. This regulator is design to accept a maximum inlet pressure of 3000 psig. *

Pipeline Regulator

Pressure Regulators



Design Features

- Large 2 3/4" diaphragm provides a large surface area for more precise pressure control
- One piece encapsulated seat design includes a sintered filter to protect the internal parts and extends the life of the regulator.
- Four port configuration, one high pressure and three low pressure ports.
- Self reseating external relief valve

*15 PSIG outlet model has neoprene diaphragm; 500 PSIG Max Inlet Pressure: no relief valve

Materials	
Body	Brass or 316 Stainless Steel
Bonnet	Brass Bar Stock
Seat	PCTFE
Diaphragm	316 Stainless Steel
Gauges	Brass or Stainless Steel
Filters	40 Micron Stainless Steel

Specifications	
Maximum Rated Inlet Pressure	3000 psig
Outlet Pressure Ranges	0-15*, 0-50, 0-125, 0-250, 0-500 psig
Flow Capacity	Cv =0.55
Ambient Operating Temperature	-20F to 125F
Weight	5 lbs
Ports	1/2" FNPT
Inlet	1/2" FNPT
Outlet	1/2" FNPT

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Delivery Pressure)	Delivery Gauge Range (psig)
Y11-N124AHF	Brass	500*	15	900	0-30 psi/kPa
Y11-N124BHF	Brass	3000	50	2000	0-100 psi/kPa
Y11-N124DHF	Brass	3000	125	4100	0-200 psi/kPa
Y11-N124FHF	Brass	3000	250	7800	0-400 psi/kPa
Y11-N124GHF	Brass	3000	500	12200	0-600 psi/kPa

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Pressure Regulators- *Specialty Application Regulators*

Pressure Regulators – *Specialty Application Regulators*

Specialty Gases and Equipment
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Natural Gas Standards

Pressure Regulators – Specialty Application Regulators Natural Gas Stds

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Vacuum Flow Regulator

High Purity – Vacuum Actuated

REGULATORS

Description: The Airgas single-stage vacuum-actuated pressure regulator is designed for use with instruments that utilize a pump to draw calibration gas. This regulator will provide the exact amount of gas that the instrument requires. The simple-to-use regulator makes calibration quick and easy by eliminating the need for sample bags, flow meters and /or special training.



Design Features

Compact size

Small and light weight

Designed specially for instruments

utilizing a pump to draw up to 8" of water column pressure with a flow rate of 0-8 lpm of calibration gas

Specifications

Inlet Pressure	See table below
Operating Temperature Range	-20°F to 140°F (-28°C to 60°C)
Demand Pressure	8" H2O
Regulator Inlet Connection	¼" NPT female or C10
Outlet Connection	⅜" Barb
Gauge Size	1.5"
Shipping Weight	0.5 lbs

Materials

Regulator Body	Aluminum / Stainless Steel
Diaphragm	Buna-N / Viton
Seat	PTFE
Seal	EPDM/Viton
Bonnet	Clear Anodized Aluminum
Gauge	Stainless Steel / Brass

Ordering Information

Product Number	Body Material	Diaphragm Material	Inlet Connection	Gauge Material	O-Ring Material	Inlet Pressure Gauge (psig)	Inlet Pressure (psig)
Y11-2900(CGA)	Alum	Buna-N	¼" NPT Female	Brass	Viton	0-3000	3000
Y11-2900C10	Alum	Buna-N	C10	Brass	Viton	0-1200	1000
Y11-4900(CGA)	Alum	Viton	¼" NPT Female	Stainless Steel	Viton	0-3000	3000
Y11-4900C10	Alum	Viton	C10	Stainless Steel	Viton	0-1200	1000
Y11-5900(CGA)	Alum	Buna-N	¼" NPT Female	Stainless Steel	EPDM	0-3000	3000
Y11-5900C10	Alum	Buna-N	C10	Stainless Steel	EPDM	0-1200	1000
Y11-6900(CGA)	SS	Buna-N	¼" NPT Female	Stainless Steel	EPDM	0-3000	3000
Y11-6900C10	SS	Buna-N	C10	Stainless Steel	EPDM	0-1200	1000
Y11-7900(CGA)	SS	Viton	1/4" NPT Female	Stainless Steel	Viton	0-3000	3000
Y11-7900C10	SS	Viton	C10	Stainless Steel	Viton	0-1200	1000

Four-Stage Analytical Regulators

Description: Regulation of gas from high to low pressure generally results in a temperature drop inside the regulator. The larger the pressure drop ($P_1 - P_2 = P_d$), the greater the cooling effect. This is commonly known as Joule-Thompson (J-T) cooling effect. The J-T effect may subject the gas mixture to temperatures below the dew point of one or more components, resulting in separation and altering the composition of the mixture.

A common solution to maintain gas temperature above the dew point when regulating condensable calibration mixtures is to use an electrically-heated regulator. These regulators will maintain the gas temperature above the mixture dew point, however, their use can pose other operational and intrinsic issues such as: 1) the need for an electric power source (not so portable); 2) an explosion-proof rating (high cost and not portable) for use with flammable mixtures; and 3) inherently large temperature swings caused by wide heating cycles (common with electrically-controlled heated regulators) resulting in inconsistent analytical results.

The Airgas Model 144 regulator reduces cylinder pressure in four stages. The design incorporates three piston-sensed stages and a final fourth adjustable pressure stage with an Elgiloy® metal diaphragm. This technology provides distribution of the J-T cooling effect between multiple stages. As a result, reduction in cooling maintains gas temperatures above the dew point in the pressure regulator while preserving the mixture composition and achieving stable analytical results.



Design Features

- Four stages** reduce J-T cooling effect and maintains mixture composition
- Check valve cylinder connection** prevents air and contaminants from entering the gas stream during cylinder change out
- Diaphragm seal outlet valve** provides for flow shut-off and maintains gas purity
- Compact and light weight design** provides for easy transport
- No electricity** required allows for portability and use with flammable gases
- Pressure gauges** monitor cylinder and delivery pressures

Specifications

Inlet Pressure	3000 psig (207 bar) maximum and rated
Outlet Pressure Ranges	0 – 30 psig (2.1 bar), 0 – 75 psig (5.2 bar)
Flow Capacity	CV = 0.014
Operating Temperature	-40°F to 140°F (-40°C to 60°C) ambient
Designed Leak Rate	Bubble-tight (helium)
Decay Inlet Characteristic	0.4/100 psi
Regulator Inlet Port	1/4" NPT Female
Inlet Connection	Specify CGA
Outlet (Regulator Body)	1/8" NPT Female
Outlet Connection	1/4" NPT Female on outlet valve
Ports (4)	1/8" NPT Female
Inlet Filter	40 micron
Gauge	1.5" (41 mm) face
Weight	2 lbs.

Materials

Body, Pistons, Gauges	316 Stainless Steel
Diaphragm (4th Stage)	Elgiloy®
Seats	PFA
Seals	PTFE and Viton®
Bonnet	Brass nickel-plated
Filter	316 Stainless Steel

Ordering Information

Product Number	Material	Inlet Pressure (maximum)		Outlet Pressure (maximum)		Inlet Gauge		Delivery Gauge	
		psig	bar	psig	bar	psig	bar	psig	bar
Y12-1144A(CGA)-AL	316 Stainless Steel	3000	207	30	2.1	0 – 3000	0 – 207	0 – 60	0 – 4.1
Y12-1144B(CGA)-AL	316 Stainless Steel	3000	207	75	5.2	0 – 3000	0 – 207	0 – 100	0 – 6.9

* Specify CGA. Insert appropriate Compressed Gas Association connection number to complete the product number.
Example: Y12-1144A350-AL. Order by complete product number.

Pressure Regulators- **Specialty Application Regulators**

EPA Protocols

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Pressure Regulators – **Specialty Application Regulators EPA Protocols**

PRESSURE REGULATORS

Ultra High-Purity



Design Features

Packless diaphragm valve built into the body

Unique internal design sweeps diaphragm cavity

Check valve CGA

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)
for easy panel mounting.

Diaphragm Packless Valve (with 1/8" Compression fitting)
promotes system purity.

Threadless Seat Design
provides longer regulator life.

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat)

Description: This series of stainless steel single-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process faster and without contamination. This is an excellent regulator for EPA protocol gas mixtures, as well as other mixes used in high purity applications.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Materials

Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	Inconel

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.23/100 psi

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat) **Cont.**

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-CHP444A(CGA)	316 SS	4,000	30	190	0 - 4,000	30Hg - 0 - 30
Y11-CHP444B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y11-CHP444D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y11-CHP444F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400
Y11-CHP444G(CGA)	316 SS	4,000	500	985	0 - 4,000	0 - 1,000

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat)

Description: This series of stainless steel two-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process more quickly and without contamination. This makes it an excellent regulator for EPA protocol gas mixtures, as well as other high purity applications.

The two-stage design provides a constant delivery pressure and the supply inlet effect that causes the outlet pressure to change as the inlet pressure drops is less than .01/100 psi of inlet pressure change.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-6} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Ultra High-Purity

PRESSURE REGULATORS



Design Features

- Packless diaphragm valve built into the body**
- Unique internal design sweeps diaphragm cavity**
- Check valve CGA**
- Convuluted Hastelloy® C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports** (with optional bonnet vent adaptors)
allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet** (with optional collar-mount nuts)
for easy panel mounting.
- Diaphragm Packless Valve** (with 1/8" Compression fitting)
promotes system purity.
- Threadless Seat Design**
provides longer regulator life.

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat) Cont.

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-CHP445A(CGA)	316 SS	4,000	30	190	0 - 4,000	30 Hg - 0 - 30
Y12-CHP445B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y12-CHP445D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y12-CHP445F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Internally Coated Stainless Steel Two-Stage Model

Description: This two-stage stainless steel, high-purity regulator has been designed to provide precise pressure regulation for the Airgas EPA Protocol Mercury Standards. The two-stage body, diaphragms, internal carriers, internal compression members, 0.06 Cv poppets, conical compression springs, 1/4" compression fitting and CGA 660 nipple are all passivated using a proprietary coating. This unique coating mitigates the chances of any level of mercury attaching to the internal wetted components of this specialty regulator. The result is a two-stage pressure regulator that will not hold back or alter any level (PPM or PPB) of the mercury standard.

The internal threadless seat design of the two-stage stainless steel regulator is the same as used in our high-purity Y12-C445 series. The convoluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. An outlet 1/4" compression fitting is provided to maintain optimum system purity.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	2-30 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150°F
Designed Leak Rate	2x10 ⁻⁸ ccs (helium)
Weight	4 lbs
Outlet	1/4" TOD Compression Fitting
Decay Inlet Characteristics	0.01/100 psi

Materials	
Body	316 Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve & Fitting	316 Stainless Steel
Trim	316 Stainless Steel

Single-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-HG445A660	316 SS	4,000	30	190	0 - 4000	30"Hg -0-30

Mercury Standards

PRESSURE REGULATORS



Design Features


- **Unique Proprietary Passivation Process**
special coating prevents mercury from "sticking" to the internal wetted components of the stainless steel regulator
- **Convoluted Hastelloy C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal
- **Threadless Seat Design**
provides longer regulator life

Disposable Cylinder Regulators

Pressure Regulators – **Specialty Application Regulators Disposable Cylinder Regulators**

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Specialty Gas Equipment









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PRESSURE REGULATORS

Disposable

Disposable Cylinder Regulators

Product								
Service	General Purpose	Non-Corrosive	General Purpose	Non-Corrosive/ Preset Flow	Non-Corrosive/ Preset Flow	Non-Corrosive/ Preset Flow	Non-Corrosive/ Preset Flow	High-Purity
Part Number	Y11 2300	Y11 2302	Y11 2303	Y11 2700A	Y11 2700AV	Y11 2701A	Y11 2701AV (AVB)	Y12 2800
	AB AN BB BN CB CN	A B C		5 9 10 15 25 50 60 90	5 9 10 15 25 50 60 90	5 9 10 15 25 50 60 90	5 9 10 15 25 50 60 90	160 165
Stage	1	1	1	1	1	1	1	2
Body	Brass	Brass	Brass	Brass Plated	Brass Plated	Brass Plated	Brass Plated	Brass Plated
Diaphragm/ Piston	Viton	Viton	Neoprene	Brass	Brass	Brass	Brass	Brass/SS
Seats	Neoprene	Neoprene	Neoprene	TFE	TFE	TFE	TFE	TFE/Viton
Inlet Connection	165	165	600	C-10	C-10	180,320,350,580, 590,1/4 FNPT	1/4 FNPT, C10/600	160,165
Inlet Pressure	300	400	300	1000	1000	3000	3000	300
Inlet Gauge	400	400	N	1200	1200	400	400	300
Valve	N Y N Y N Y	N	N	N	Y	N	Y	N
Outlet Connection	1/4 Barb 1/8 FPT	1/4 Barb 1/8 FPT	1/4 Barb 1/8 FPT	1/4 Barb	1/8 Barb	3/16 Barb	1/8 MNPT	1/8 FNPT
Outlet Pressure	10 25 50	5 7.5 15	25	60	60	60	60	10 60
Gauge	N	N	N	N	N	N	N	Y
Orifice			0.005					
CV	0.03	0.03		0.02	0.02	0.02	0.02	0.02
Flow Rate, LPM	4.13 6.95 11.3	5.5 8 7.5	N/A	0.3 0.5 0.9 1 1.5 2.5 5 6 9	0.3 0.5 0.9 1 1.5 2.5 5 6 9	0.3 0.5 0.9 1 1.5 2.5 5 6 9	0.3 0.5 0.9 1 1.5 2.5 5 6 9	7.2

Product								
Service	Corrosive/ Preset Flow	Corrosive/ Preset Flow	Mildly Corrosive/ Selectable Flow	General Purpose	General Purpose	Non-Corrosive	Mildly Corrosive	Mildly Corrosive
Part Number	Y11 4704	Y11 4704V	Y11 530A	Y11 5301	Y11 5301G	Y11 5302	Y11 5500	Y11 5501
	5 7 10 15 25 50 70	5 7 10 15 25 50 70	180 580 590 660 C10	3 5 10	3 5 10	A B C	A AV B BV	A AV AS AVS B BV BS BSV D DV DS DSV
Stage	1	1	1	1	1	1	1	1
Body	SS	SS	Aluminum	Aluminum, Gold Anodized	Aluminum, Gold Anodized	Aluminum	Aluminum	Aluminum
Diaphragm/ Piston	SS	SS	Aluminum	Neoprene	Neoprene	Viton	SS	SS
Seats	TFE	TFE	Nylon	Neoprene	Neoprene	Neoprene	TFE	TFE
Inlet Connection	C-10	C-10	180,580,590,660, C-10, 1/8 FNPT	600	600	165	160,165,170,180, 1/8 FNPT	320,350,580,590,660,1/8 FNPT
Inlet Pressure	1200	1200	3000	300	300	400	500	3500
Inlet Gauge	1200	1200	3000	N	300	400	600	N 3500 N 3500 N 3500
Valve	N	Y	N	Y	Y	N	N Y N Y	N Y N Y N Y N Y N Y
Outlet Connection	3/16 Barb	3/16 Barb	1/4 Barb	1/4 Barb	1/4 Barb	1/4 Barb	1/8 FPT	1/8 FPT
Outlet Pressure	60	60	50	50	50	5 7.5 15	25 60	25 60 100
Outlet Gauge	N	N	N	N	N	N	N	60 N 100 N 200 N
Orifice				0.008	0.008			
CV	0.02	0.02				0.03	0.08	0.08
Flow Rate, LPM	0.3 0.5 0.7 1 1.5 2.5 5 7	0.3 0.5 0.7 1 1.5 2.5 5 7	0.3-8.0 Selectable	0.3 0.5 1	0.3 0.5 1	5.5 8 7.5	N/A	N/A

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PRESSURE REGULATORS

Special Service



Airgas® LaserPLUS™ High-Flow Dome-Loaded Laser Regulators

Description: The Airgas® Special Service Laser Regulator is a high-flow dome-loaded regulator. This regulator has an integral remote sensing pilot which yields high flow capacity with near perfect performance, unique in a compact unit.

Since this regulator is dome loaded by a remote sensing pilot regulator, it becomes a servo-regulator, and the overall performance is determined by the performance of the pilot regulator.

This Laser Regulator is the key component in laser applications.

Design Features

Standard Encapsulated Seats With 10-micron Filters

Use With a Variety of Gases

argon, helium, nitrogen, oxygen.

Tamper Proof

self-reseating internal safety valve.

Conforms to CGA E-4 Standard

for use with gas pressure regulators.

Panel Mounting Option

Bonnet threaded for mounting.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Range	0-250, 0-500, 0-1,000 psig
Flow Capacity	Cv = 0.55
Decay Inlet Characteristics	0.3/100 psi
Ambient Temperature	70° F
Designed Leak Rate	1 x 10 ⁻⁶ scc/sec
Weight	8 lbs. (3.63 kg)
Ports	1/4" FNPT
Inlet	1/2" FNPT
Outlet	1/2" FNPT
Gauge Size	2 1/2" diameter

Materials	
Body	Brass bar stock
Bonnet	Brass bar stock
Seat	PTFE
Diaphragm	PTFE
Gauges	Brass
Filter	Nickel-plated sintered bronze – 10 microns
Seals	PTFE
Elastomeric Seals	Neoprene®

Ordering Information


Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Outlet Gauge Range (psig)
Y11-750250	Brass	3,000	250	7,500	0-4,000	0-400
Y11-750500	Brass	3,000	500	15,800	0-4,000	0-600
Y11-7501000	Brass	3,000	1,000	29,500	0-4,000	0-2,000

Available Options

Product Number	Description
Y11-9100887	Panel Mounting Kit

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Medical Flow Click Regulators

Description: These single piece body medical regulators are designed with an outlet orifice that controls the flow rate to both medical professionals and their patients. The 221 series regulators are design for helium/oxygen ratio of 80:20 or 70:30 and are supplied with either an 890 medical yoke or a 280 CGA nut and nipple. The 1815 and 1515 series regulators are designed for pure oxygen and are supplied with an 870 medical yoke or a 540 CGA nut and nipple.



Specifications	
Maximum Inlet Pressure	3000 psig
Flow increments	
0-15	0.5, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 15.0
0-20	1.0, 2.0, 3.0, 4.0, 5.0, 8.0, 10.0, 12.0, 15.0, 18.0, 20.0
Outlet pressure	50 psig
Outlet connection	3/16" hose barb
Gauge	1.5" face

Design Features


- Compact, lightweight design – easy for transportation
- Single-piece body construction – provides robust, durable regulator
- Ergonomically friendly five-lobe knob – simplifies hand tightening
- Meets ASTM-G 175-03 promoted ignition standards

Materials	
Body	Aluminum
Seal	Viton
All other Wetted parts	Brass
Gauge	Brass

Ordering Information			
Product Number	Material	Max Inlet Pressure (psig)	Capacity (scpm @ Max Del. Press.)
11-1815OU	Oxygen	870 Yoke	0-15
Y11-1515OU	Oxygen	540 CGA	0-15
Y11-221020	70:30	890 Yoke	0-20
Y11-221120	80:20	890 Yoke	0-20
Y11-221220	70:30	280 CGA	0-20
Y11-221220	80:20	280 CGA	0-20

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Incubator Regulator

Incubator Regulator

SPECIALTY REGULATORS

Description: This unique two stage-regulator is specifically design for CO₂ service to provide gas to incubators. The regulator may also be used for the nitrogen gas supply as well.

The two-stage design eliminates troublesome freezing when CO₂ is flowing due to the Jules Thompson effect. This regulator has a cartridge seat assembly to provide better flow characteristics and long life.



Specifications	
Maximum Rated Inlet Pressure	3500 psig
Outlet Pressure Ranges	0-25, 0-50 psig
Flow Capacity	Cv=0.19
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble Tight (helium)
Weight	4 LBS
Ports (4)	¼ " FNPT
Outlet	¼ " Hose Barb
Decay Inlet Characteristic	0.42/100 psi

Design Features

Filtered seat

For added gas stream purity and extended service life

Large, Reinforced Diaphragms

Provide precise pressure control

Large, 2" Black Painted, Steel Case Gauges

Dual Scale for easy pressure setting.

Preset Safety Relief Valve

Prevents excessive pressure buildup

Brass Bar Stock Body

Provides long-lasting good looks; will not tarnish

Materials

Body	Brass
Bonnet	Glass filled nylon
Seat	PFA
Diaphragm	Neoprene
Gauge	Steel painted case
Filters	Stainless steel and bronze

Ordering Information

Product Number	Gas Service	Material	MAWP	Outlet Pressure	Inlet Gauge	Outlet Gauge
Y12-200A320	CO ₂	Brass	3,500	25 psig	0-4,000 psig	0 – 30 psig
Y12-200B320	CO ₂	Brass	3,500	50 psig	0-4,000 psig	0 – 100 psig

Incubator Line Regulator w/Dual Outlets

Incubator Line Regulator

REGULATORS

Description: This line regulator is specifically designed to supply gas to multiple incubators from a single house line. The regulator will control the pressure from the source to the incubators. The ball valves provide positive shut off while giving a visual indication of open or closed.

The regulator comes mounted to a bracket to allow for easy wall mounting. The hose barbs allow for easy installation to the incubators.



Specifications	
Maximum Rated Inlet	1,200 psig
Pressure Ranges	0-25, 0-50, 0-100
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	2.4 lbs
Inlet	1/4" FNPT
Outlet	1/4" hose barb
Decay Inlet Characteristic	0.23/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauge	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Trim	Nickel-Plated Brass

Design Features

Regulator

Filtered seat: for added gas stream purity and extended service life.
Stainless steel diaphragm eliminate outgassing associated with elastometric diaphragms.
Bar stock body provides low internal volume.
Encapsulated filtered seat assembly protects valve seat, extend service life.
Nickel-plated brass body provides long-lasting good looks; will not tarnish.
Mounting: regulator is mounted to a wall mount bracket.


Ball valves

Provide positive shut off
Provides visual indication of open or close position
1/4" hose barbs on outlets

Optional Parts						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)	Relief Valve Setting (psig)
Y11-LS721A2B	Brass	1,200	25	275	30" Hg-0-30	85
Y11-LS721B2B	Brass	1,200	50	420	0 - 60	150
Y11-LS721D2B	Brass	1,200	100	660	0 - 200	150

**Specialty Gases and Equipment
Product Reference Guide**

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High-Purity Back-Pressure

Description: These back-pressure regulators control the inlet pressure rather than outlet pressure. They are very similar to relief valves in operation and are actually used as relief valves in many applications requiring high sensitivity and close tolerances on crack/reseat pressure relationships. This compact series of regulators is hand-adjustable and spring-loaded. A diaphragm sensor provides precise pressure control.

High-Purity

PRESSURE REGULATORS



Design Features

Convuluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Specifications	
Maximum Rated Inlet Pressure	250 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-65° F to +165° F
Designed Leak Rate	1 x10 ⁻⁴ ccs (helium)
Weight	2 lbs
Ports (2)	1/4" FNPT

Materials	
Body	Nickel-Plated Brass or 316L Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316 Stainless Steel

Ordering Information		
Product Number	Control Pressure Range (psig)	Material
Y11-BP125	0-25	Brass
Y11-BP150	0-50	Brass
Y11-BP1250	0-250	Brass
Y11-BP425	0-25	316 SS
Y11-BP450	0-50	316 SS
Y11-BP4100	0-100	316 SS
Y11-BP4250	0-250	316 SS

	Available Options	
	Product Number	Description
	Y99-BONNET ADP	Bonnet Vent Adaptor
	Y99-CHROMNUT	Panel Mounting Nut (2 required)
	Y99-26460	1/4" MNPT x 1/4" Compression

**Specialty Gases and Equipment
Product Reference Guide**

Engineering the Right Solutions



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High Purity Two-Stage Electrically Heated Regulator

Description: This Airgas regulator can be used with gases that encounter the Joule-Thompson effect created in pressure drops across the internal orifices in a regulator. The regulator will maintain the gas in the vapor phase by supplying heat at the regulator's internal orifice while providing a constant delivery pressure.

Design Features

Two-Stage Design

provides a constant delivery to the application

Electrical Specifications

all electrical components are UL-listed

Design for Continuous Flow

up to 100 SCFH of carbon dioxide

Materials

Regulator Body	Chrome-plated brass
Diaphragm	Stainless Steel
Piston	Brass
Seat	PTFE
Seal	Buna-N
Bonnet	Chrome-plated die cast
Gauges	Chrome-plated brass
Outlet Diaphragm Valve	Chrome-plated brass
Diaphragm	Stainless Steel
Seat	PCTFE

Electrical-Heated Regulator

PRESSURE REGULATOR



Specifications

Max Inlet Pressure	3000 psig
Outlet Pressure Range	10-125 psig
Ambient Temperature Range	4 °F to 140 °F
Heater	200 Watt cartridge style
Heater Temperature	90F to 125F +/- 8F nonadjustable
Power Requirement	120 Voltage (240 Voltage option)
Flow Coefficient	Cv = 0.15
Supply Pressure Effect	0.04/100 psi
Ports	¼" NPT female
Inlet Port	Specify CGA Connection
Outlet Port	¼" NPT female
Gauge Size	2.5" face
Approximate Weight	7 lbs

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-EH700E-CGA*	Brass	3000	125	0-4000	30" 0-200

*This regulator is not suitable for flammable gases.

Electrical Heated Regulator

Description: This Airgas regulator is designed to heat and vaporize media to keep condensable liquids in the gas phase. These regulators are commonly used in gas chromatography, hydrocarbon sampling, fluid fraction-alization, sampling conditioning and to preheat heavy process fluids.

This uniquely designed regulator allows the user to dis-assemble the regulator and heat transfer components for complete cleaning and repair of the unit, reducing expense cost and down time.

Specifications	
Max Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-10, 1-30, 2-60, 3-100, 10-250, 20-500 psig
Operating Temperature	200 watts up to 500F
Ambient Temperature	-4F to 104F
Flow Coefficient	Cv= 0.06
Inlet Connection	½" NPT female
Outlet Connection	¼" NPT female
Internal Volume	4.6 cc
Power Requirements	120 Voltage (240 Voltage option)
Temperature Controller	220F to 380F
Approximate Shipping Weight	8 lbs

Materials	
Body	316L Stainless Steel
Compression Member	Inconel 625
Diaphragm	Hastelloy C22
Seat	Vespel
Filter	Stainless Steel
Heater Seal	PEEK
Other Metals Parts exposed to the Media	Hastelloy, Inconel and 316L Stainless Steel
Bonnet	303 Stainless Steel

Electrical Vaporizing Regulator

PRESSURE REGULATORS



Design Features

- Low Internal Volume – allows rapid purging and stabilization of gas flow
- Electrical Approval – CSA, CE-ATEX certified
- Electrical Specifications – UL and CSA listed Class 1 Groups A,B, C and D
- Convoluted Hastelloy C22 Diaphragm – eliminate outgassing associated with elastomeric diaphragm

Single-Stage Ordering Information

Product Number	Delivery Pressure Range (psig)
Y11-V83556A	0-10
Y11-V83556B	1-30
Y11-V83556C	2-60
Y11-V83556D	3-100
Y11-V83556E	10-250
Y11-V83556F	20-500

Specialty Gases and Equipment Product Reference Guide

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PRESSURE REGULATORS

Corrosive Service

Economy Model



Description: These single-stage regulators are designed for mildly corrosive gases that attack brass or copper-bearing alloys. Each regulator features a large diaphragm which provides excellent performance and precise pressure control.

These regulators are constructed of aluminum alloy and are equipped with stainless steel gauges, a sintered stainless steel inlet filter and a stainless steel instrument valve.

Design Features

Filtered Seat

for added gas stream purity and extended service life.

Aluminum Alloy Construction

improves flow capacity of liquefied gases with low vapor pressures.

2½" Stainless Steel Gauges

permit accurate and easy reading.

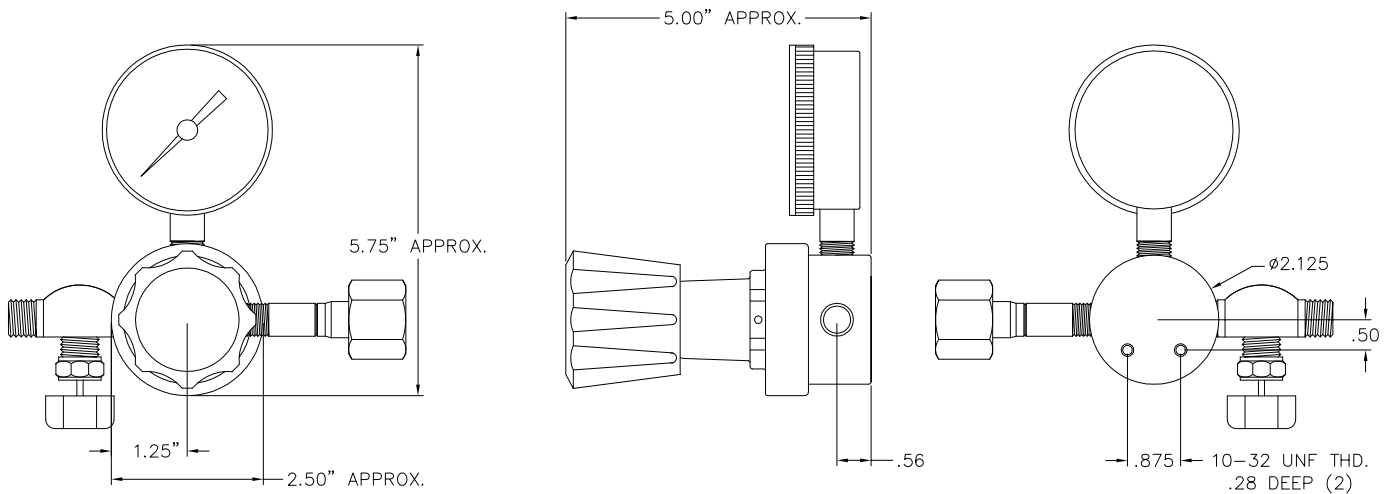
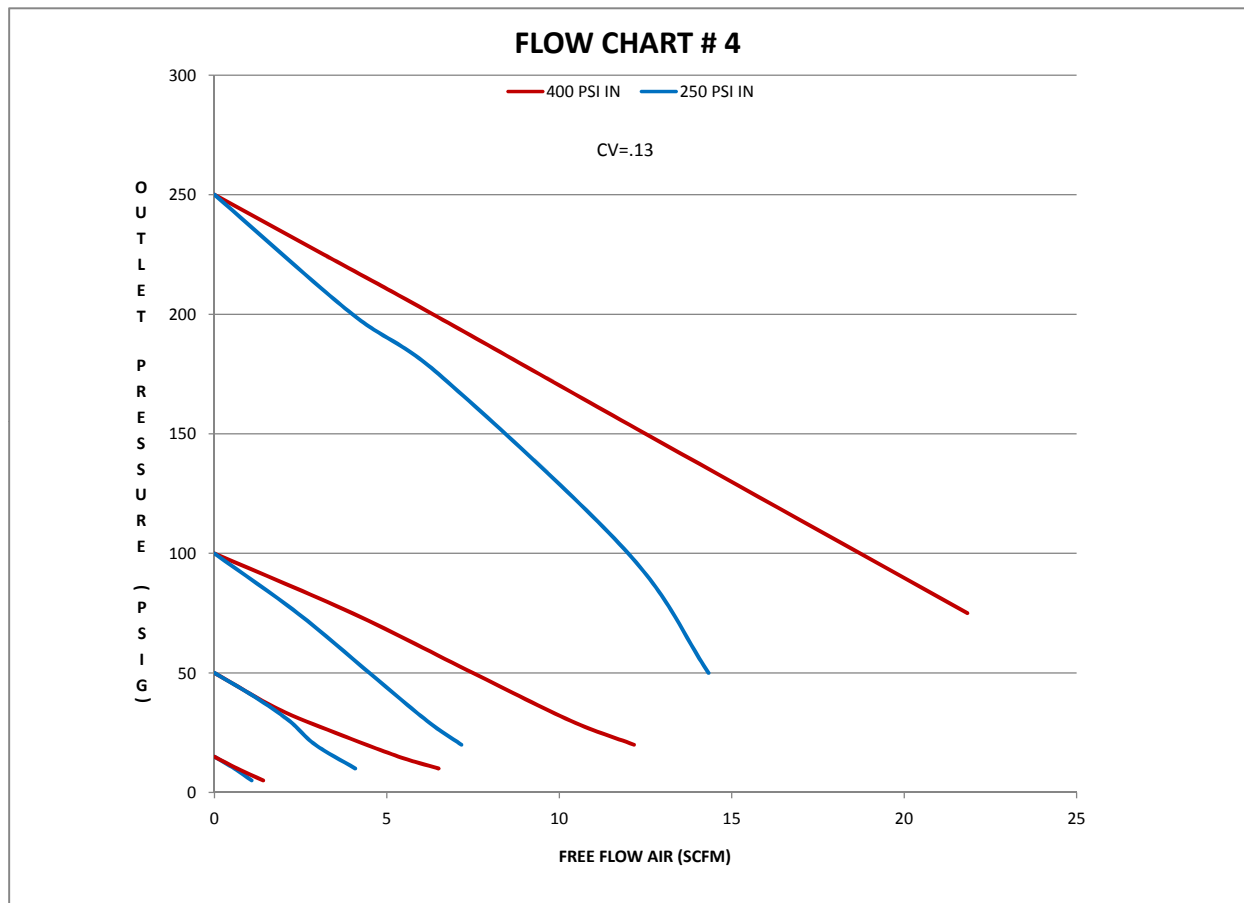
Specifications	
Maximum Rated Inlet Pressure	400 psig
Outlet Pressure Ranges	0-50 psig
Flow Capacity	Cv=0.12
Ambient Operating Temperature	-20° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3 lbs
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.35/100 psi

Materials	
Body	Aluminum Alloy
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316 Stainless Steel
Gauges	2½" Stainless Steel
Filter	Sintered Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	302 Stainless Steel
Trim	Aluminum, Stainless Steel

Ordering Information							
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Type	Delivery Gauge Range (psig)	Safety Relief Valve (psig)
Y11-C520C(CGA)	Aluminum	400	50	600	Single Stage	0-100	N/A

NOTE: Due to the corrosive nature of the gases used with this regulator, a cross purge assembly is required to maintain the warranty and for safety.

Available Options	
Product Number	Description
Y99-CPA4(CGA)	Stainless steel cross purge assembly.



SINGLE STAGE REGULATOR

PRESSURE REGULATORS

Corrosive Service



Y11-C484A pictured

Standard Model

Description: These regulators are recommended for use with acid-forming gases where brass and copper-free systems are required. The proven, low-maintenance design features a PCTFE seat for wide media compatibility.

Note: A Cross-Purge Assembly must be used in conjunction with these models in order to ensure effective purging of hazardous gas traces during cylinder change out.

Design Features

- Filtered Seat**
for added gas stream purity and extended service life.
- PCTFE Seat**
provides wide range of media compatibility.
- Large, 2½" Stainless Steel Gauges**
permit accurate, easy reading.
- Sintered Stainless Steel Filter**
protects parts, extends service life.

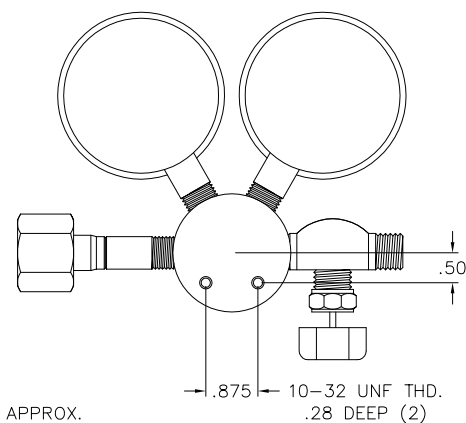
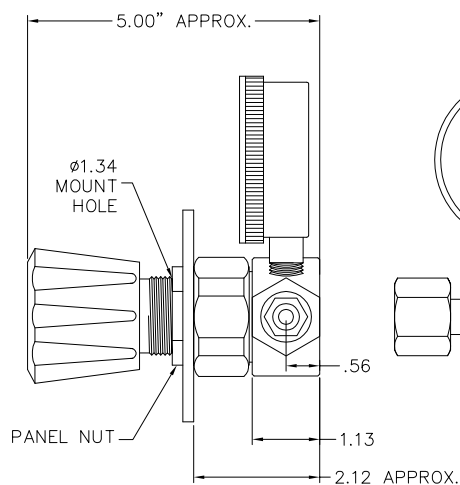
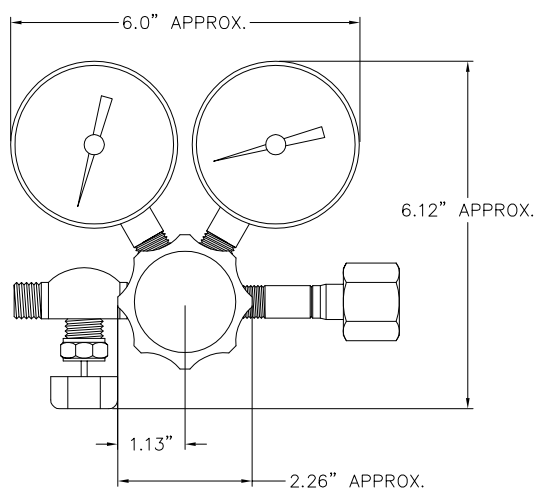
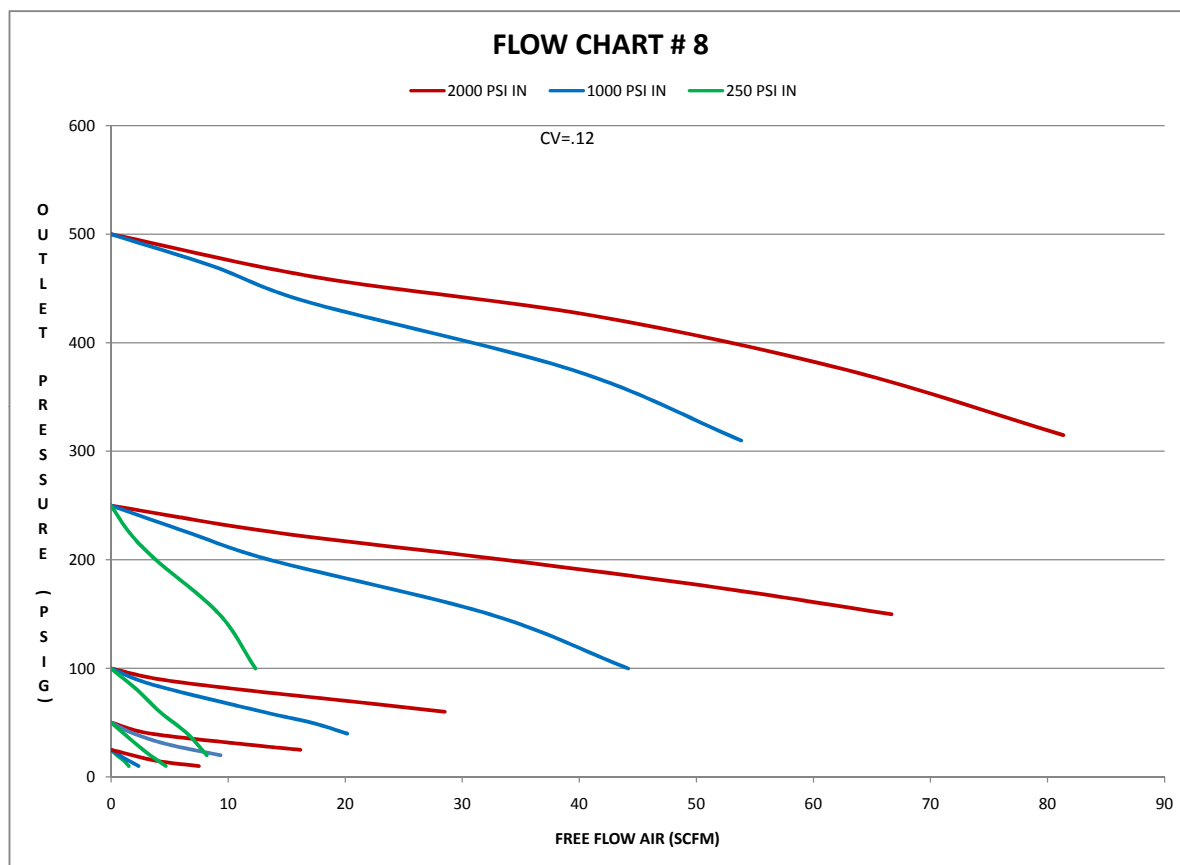
Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.12
Ambient Operating Temperature	-20° F to +150° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.15 lbs
Outlet	¼" MNPT Instrument Valve
Decay Inlet Characteristic	0.35/100 psi

Materials	
Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316 Stainless Steel
Gauges	2½" Stainless Steel
Filter	Sintered Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Trim	Stainless Steel

Ordering Information							
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Type	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-C484A(CGA)	316 SS	3,000	25	200	Single Stage	0 - 4,000	0-30
Y11-C484B(CGA)	316 SS	3,000	50	380	Single Stage	0 - 4,000	0-100
Y11-C484D(CGA)	316 SS	3,000	100	1,480	Single Stage	0 - 4,000	0-200
Y11-C484F(CGA)	316 SS	3,000	250	3,000	Single Stage	0 - 4,000	0-400
Y11-C480A(CGA)	316 SS	1,000	25	200	Single Stage	None	0-30

NOTE: Due to the corrosive nature of the gases used with this regulator, a cross purge assembly is required to maintain the warranty and for safety.

Available Options	
Product Number	Description
Y99-CPA4(CGA)	Stainless steel cross purge assembly.



SINGLE STAGE REGULATOR

Deluxe Model

Corrosive Service

PRESSURE REGULATORS

Description: Designed for the pressure control of corrosive halogen gases, the deluxe corrosive service regulators have all-wetted parts of either PCTFE, Iconel® or Monel materials and are protected internally by a sintered Monel filter.

This model has a unique design that allows the regulator to be easily rebuilt.

Note: A Cross-Purge Assembly must be used in conjunction with these models in order to ensure effective purging of hazardous gas traces during cylinder change out.



Design Features

Filtered Seat

for added gas stream purity and extended service life.

PCTFE Seat

provides wide range of media compatibility.

Sintered Monel Filter

protects parts, extends service life.

2 1/2" Monel Gauges

permit accurate and easy reading.

Easy Replacement Seat Assembly

seat can be replaced easily by way of an external removable back cap.

Specifications

Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-50, 0-200 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-20° F to +150° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.75 lbs
Outlet	1/4" MNPT Monel Instrument Valve
Decay Inlet Characteristic	0.35/100 psi

Materials

Body	Monel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Monel
Gauges	2 1/2" Monel
Filter	Sintered Monel
Valve Stem	Monel
Valve Spring	Iconel®
Trim	Nickel-Plated Brass

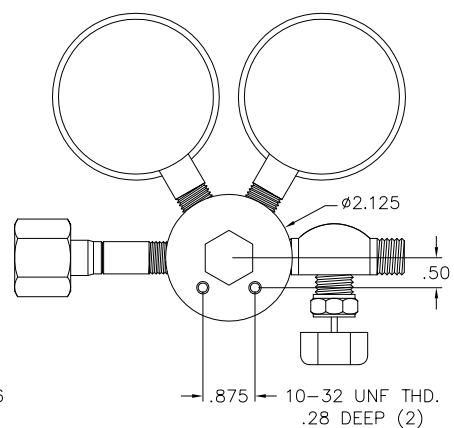
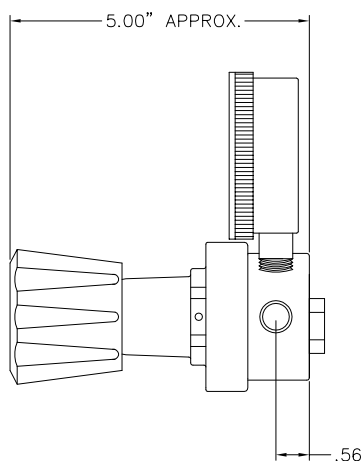
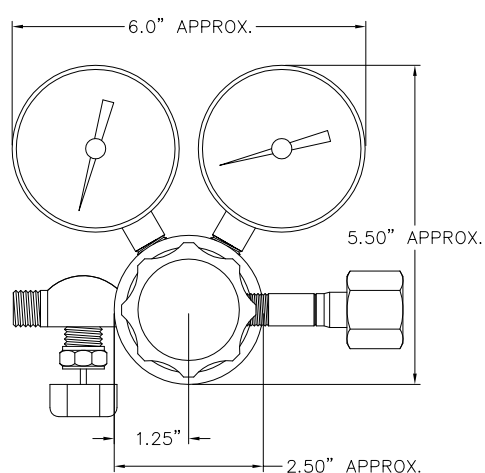
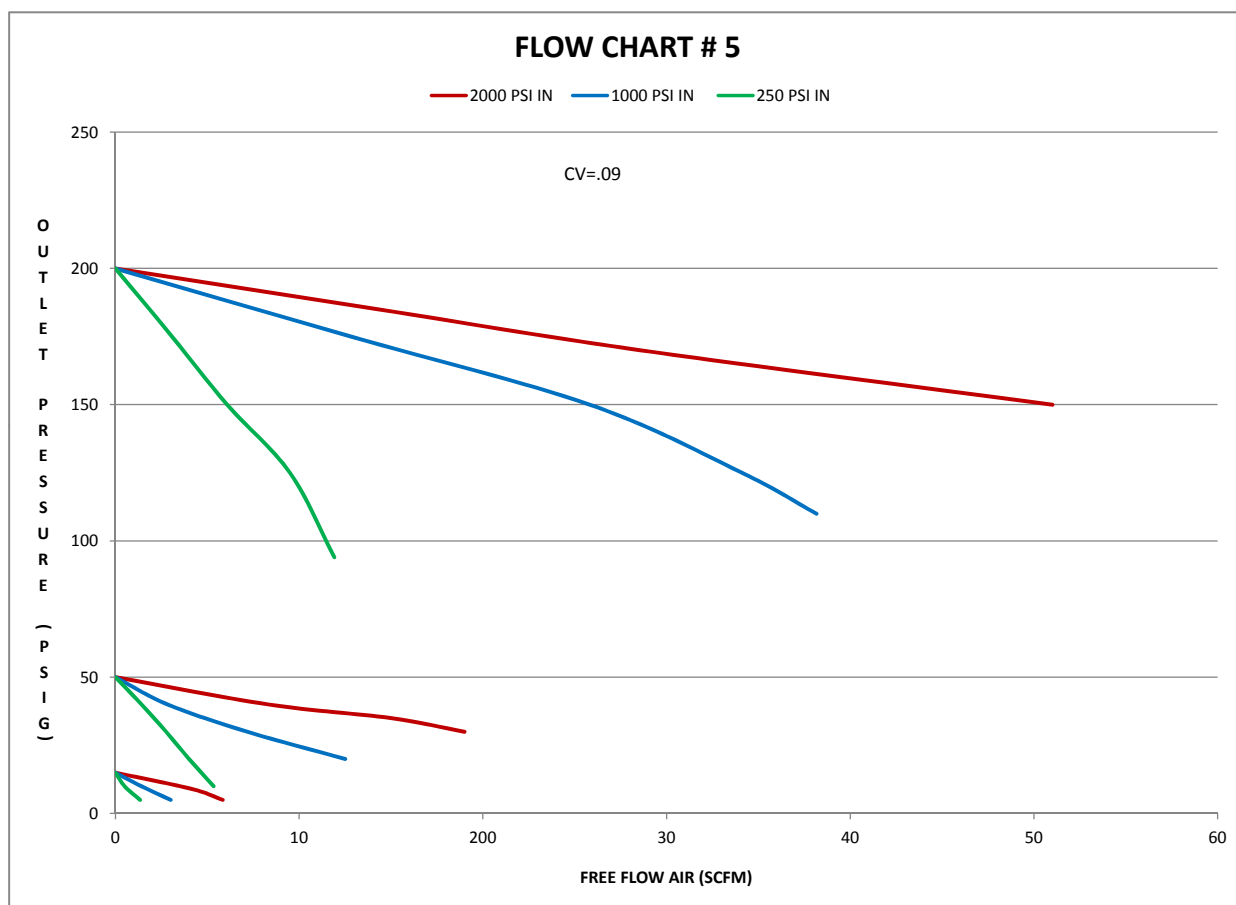
Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Type	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-C334C(CGA)	Monel	3,000	50	200	Single Stage	0-3,000	0-100
Y11-C334E(CGA)	Monel	3,000	200	780	Single Stage	0-3,000	0-300

NOTE: Due to the corrosive nature of the gases used with this regulator, a cross purge assembly is required to maintain the warranty and for safety.

Available Options

Product Number	Description
Y99-CPAM(CGA)	Monel cross purge assembly.

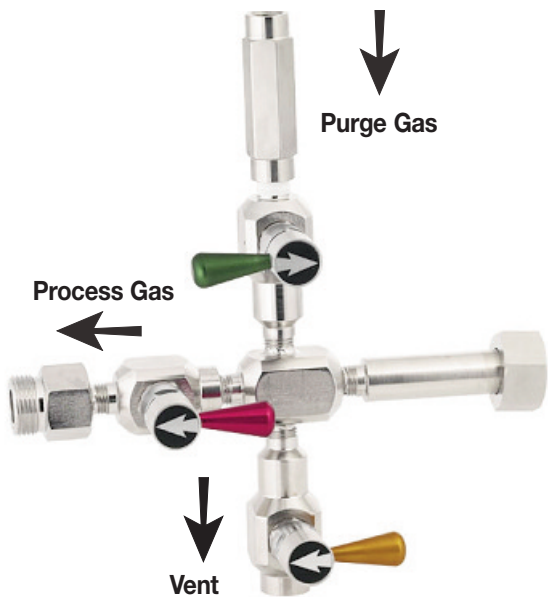


SINGLE STAGE REGULATOR

MISCELLANEOUS EQUIPMENT

Purge Assemblies

Cross-Purge Assemblies



Description: These compact cross-purge assemblies provide effective purging during cylinder change out. Hazardous gas traces are eliminated before opening the cylinder connection, and atmospheric gases are removed after reconnection. The quarter-turn diaphragm valves allow easy, fast purge cycles, while the color-coded lever handles indicate gas flow and mode of operation. These assemblies are also designed to prolong the service life of regulators and other gas system components.

These cross purge assemblies are essential for the safety of the operator changing the cylinders to prevent exposure to the hazardous gas. Also the prevent premature regulator failure and are required for warranty.

Each cross-purge assembly incorporates the use of an integrated check valve to prevent backflow of process gas into the purge line.

Specifications/Materials	
Maximum Rated Inlet Pressure	3,000 psig
Body	316 Stainless Steel or Monel Metal
Weight	4 lbs

Ordering Information		
Product Number	Max Pressure (psig)	Material
Y99-CPA4(CGA)	3,000	Stainless Steel
Y99-CPAM(CGA)	3,000	Monel

Economy Corrosive Environment Two Stage Regulator

Description: This economically priced two stage regulator is designed for analytical applications where the regulator is located in corrosive environments but uses none corrosive gases. The regulator has a stainless steel diaphragm for high purity applications; the needle valve is built into the body to shorten the gas path.

These regulators also have a check valve CGA that prevents contaminants from entering the gas stream during cylinder change out.

The regulator has liquid filled gauges to protect the gauge movement from corrosive environments damaging this movement. The bonnets are a resin material to prevent discoloration from the environment as well. This regulator will last a long time in these environments and prevent common failures as seen on other regulator commonly used in corrosive environments.

Analytical Regulators

TWO STAGE CORROSIVE ENVIRONMENTS



Design Features

Check Valve CGA

Prevents air and contaminants from entering the process stream during cylinder change out

Liquid filled gauges

prevent the environment from causing gauge failure

Resin bonnets and nickel plated brass body

protects the appearance

Stainless steel diaphragm

eliminates off gassing associated with elastomeric diaphragms

Needle valve

is built into the body to shorten gas path

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-250 psig
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	5 lbs
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.23/100 psi

Materials

Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	Needle valve in body
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-DW215A(CGA)	Brass	3500	25	250	85	0-4,000	30" Hg-0-30
Y12-DW215B(CGA)	Brass	3500	50	450	150	0-4,000	0-60
Y12-DW215D(CGA)	Brass	3500	100	900	150	0-4,000	0-200
Y12-DW215F(CGA)	Brass	3500	250	1500	350	0-4,000	0-400

Severe Duty Stainless Steel Models

High Purity

PRESSURE REGULATORS

Description: The complete stainless steel construction of these regulators allows for the high-purity design to function in the most severe environments. Harsh corrosive environments which have high levels of sea salt, fluorides, unnaturally occurring chlorides, sulfides or other acidic/caustic elements in the ambient atmosphere will cause premature degradation of brass and most vinyl plastics. The near bullet-proof design of the Airgas Severe Duty Regulator provides exact pressure regulation while resisting the negative effects of a corrosive environment.

These regulators also have a check valve CGA that prevents contaminants from entering the gas stream during cylinder change out.

The internal threadless seat design of these single and two-stage stainless steel regulators is the same as used in our high-purity Y11-C444 & Y12-C445 series. The convoluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. A 1/4-turn packless diaphragm outlet valve with a 1/4" compression fitting is provided to maintain optimum system purity. Captured bonnet vent ports are plugged with sintered mufflers which minimize the negative corrosive effects on the control spring assemblies. The regulator bodies are ultrasonically cleaned for the most demanding high-purity service.



Design Features

- **Stainless Steel Bonnets**
provides superior protection against corrosive environments.
- **Metal Pressure Control Knob**
anodized to resist any premature degradation.
- **Convoluted Hastelloy C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal.
- **Integral Check Valve in CGA**
virtually eliminates atmospheric contamination that occurs during cylinder change out.
- **1/4 Turn Diaphragm Packless Outlet Valve**
provide metal-to-metal positive shutoff
1/4" compression outlet fitting
- **Threadless Seat Design**
provides longer regulator life

Materials

Body	316 Stainless Steel
Bonnet	303 Stainless Steel
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve & Fitting	316 Stainless Steel
Trim	316 Stainless Steel

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	2-30 psig, 3-60 psig, 4-100 psig, 5-250 psig
Ambient Operating Temperature	-40° F to +150°F
Designed Leak Rate	2 x 10 ⁻⁸ ccs (helium)
Weight	6 lbs.
Outlet	1/4" TOD Compression Fitting

Single-Stage Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-SD474A(CGA)	316 SS	4,000	30	900	0 - 4000	0-60
Y11-SD474B(CGA)	316 SS	4,000	60	1,250	0 - 4000	0-100
Y11-SD474D(CGA)	316 SS	4,000	100	1,750	0 - 4000	0-200
Y11-SD474F(CGA)	316 SS	4,000	250	2,700	0 - 4000	0-400

Two-Stage Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-SD474A(CGA)	316 SS	4,000	30	190	0 - 4000	0-60
Y12-SD474B(CGA)	316 SS	4,000	60	270	0 - 4000	0-100
Y12-SD474D(CGA)	316 SS	4,000	100	380	0 - 4000	0-200
Y12-SD474F(CGA)	316 SS	4,000	250	850	0 - 4000	0-400

Pressure Regulators- Specialty Application Regulators
Specific Gas Service

Specialty Gases and Equipment
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Pressure Regulators – Specialty Application Regulators Specific Gas Service

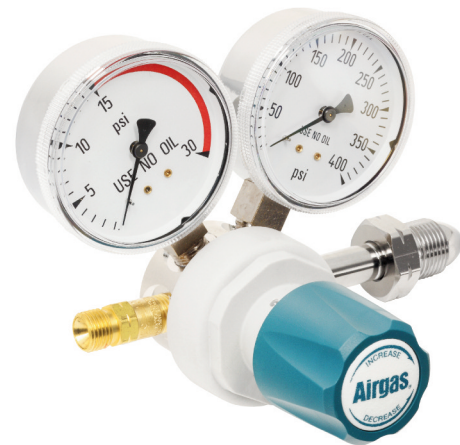
Acetylene Models

Special Service

PRESSURE REGULATORS

Description: Specially designed for acetylene service, these unique, single-stage regulators are engineered to provide precision performance. The regulators feature a 10-micron, sintered stainless steel filter and a PTFE-lined, nylon-reinforced neoprene diaphragm.

Because delivery pressure of acetylene should not exceed 15 psig, these regulators are equipped with a special pressure gauge that features a red warning to indicate unsafe delivery pressure. They are also equipped with a reverse-flow check valve to prevent backflow of gas into the regulator on the outlet.



Design Features

Filtered Seat

for added gas stream purity and extended service life.

10-micron Filter

protects internal parts and filters gas stream.

Reverse-Flow Check Valve

prevents the reverse flow of gas into the regulator.

Large, Reinforced Diaphragm

provides excellent performance characteristics.

Red Warning Delivery Gauge

indicates delivery pressure exceeding 15 psig.

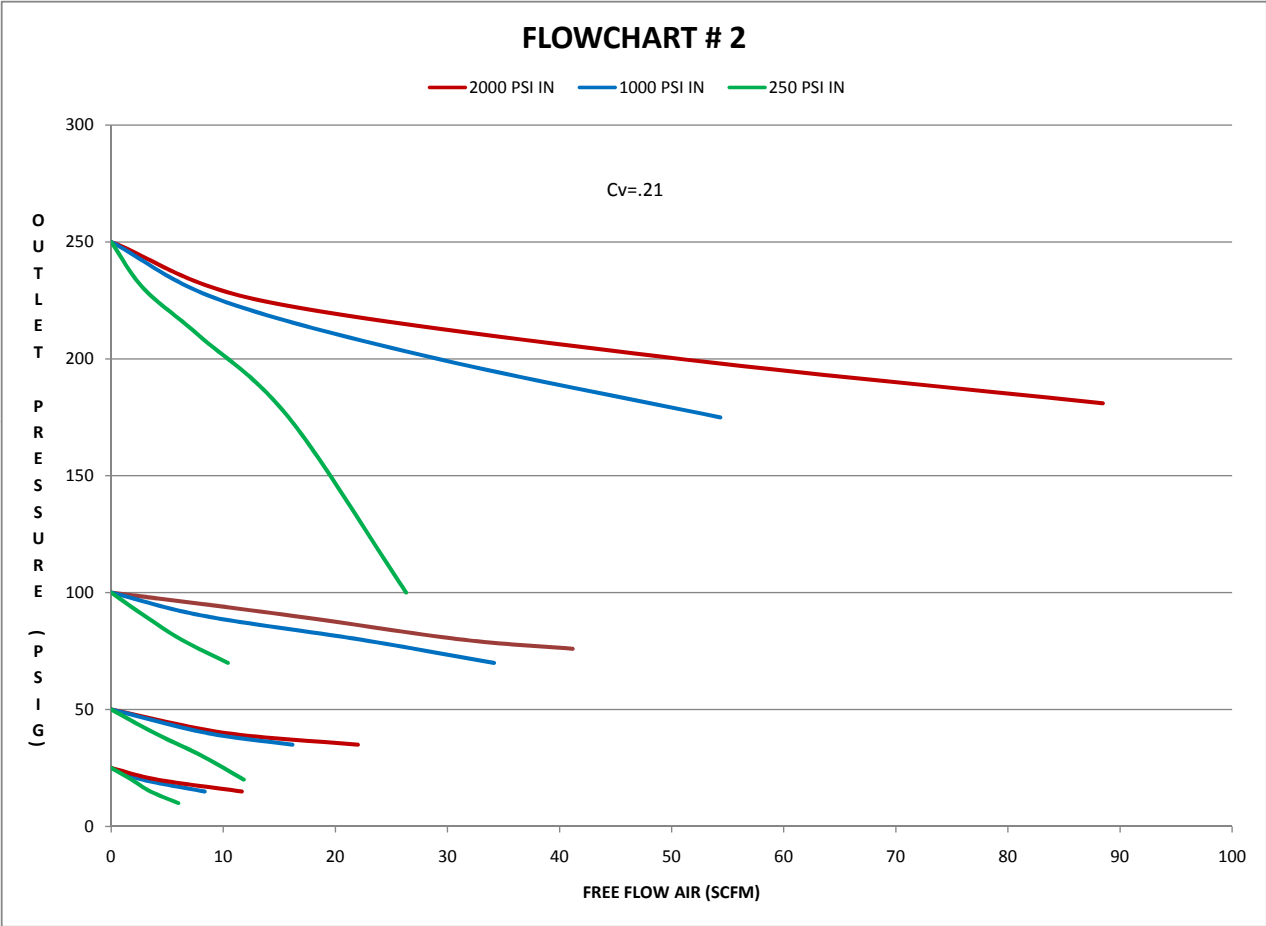
Specifications	
Maximum Rated Inlet Pressure	400 psig
Outlet Pressure Ranges	0-15 psig
Flow Capacity	Cv=0.15
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3.32 lbs
Outlet	9/16-18 LH
Decay Inlet Characteristic	0.085/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Composite
Seat	PTFE
Diaphragm	Stainless Steel
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel and Bronze
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Trim	Nickel-Plated Brass

Ordering Information							
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Type	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-120A(CGA)	Brass	400	15	210	Single Stage	0-400	0-30

Redline @ 15 psi.

Available Options	
Product Number	Description
Y80-73100	Acetylene Filter



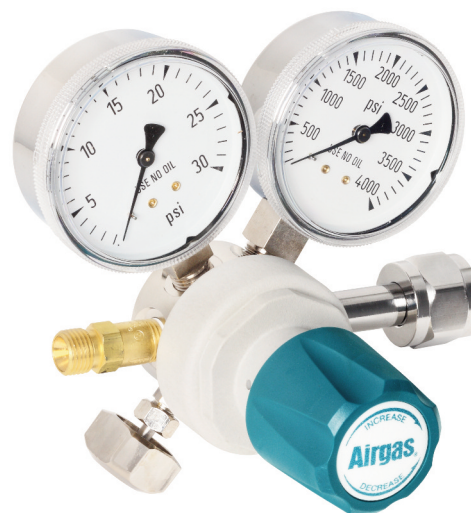
Oxygen Models

Special Service

PRESSURE REGULATORS

Description: These oxygen service regulators are manufactured using the latest materials of construction. They feature a large, stainless steel diaphragm for excellent performance, long life, and easy maintenance. Dual filters protect internal components from contamination and restrict velocity to reduce adiabatic heat of recompression. A preset safety relief valve is standard.

This regulator is designed with unique materials and is specially cleaned for oxygen service.



Design Features

Brass, Bar Stock Construction

ensures compatibility of oxygen service.

Encapsulated Filter Seat Assy

protect internal parts and filter gas stream.

Safety Relief Valve

quickly reduces excess pressure within the regulator.

Reverse-Flow Check Valve

prevents the reverse flow of gas into the regulator.

Specifications		Materials	
Maximum Rated Inlet Pressure	3,000 psig	Body	Nickel-Plated Brass
Outlet Pressure Ranges	0-25, 0-50, 0-100, 0-200 psig	Bonnet	Composite
Flow Capacity	Cv=0.15	Seat	PTFE
Ambient Operating Temperature	-40° F to +165° F	Diaphragm	Stainless Steel
Designed Leak Rate	Bubble-Tight (helium)	Gauges	2 1/2" Nickel-Plated Brass
Weight	3.2 lbs	Filter	Bronze
Ports (4)	1/4" FNPT	Valve Stem	316 Stainless Steel
Outlet	9/16-18 RH	Valve Spring	316 Stainless Steel
Decay Inlet Characteristic	0.58/100 psi	Trim	Nickel-Plated Brass

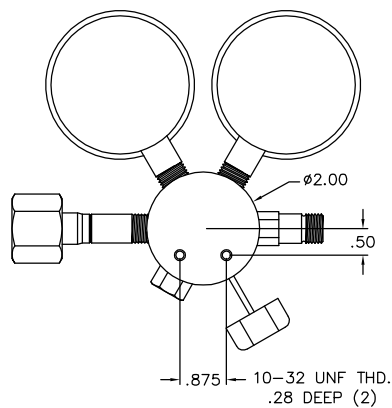
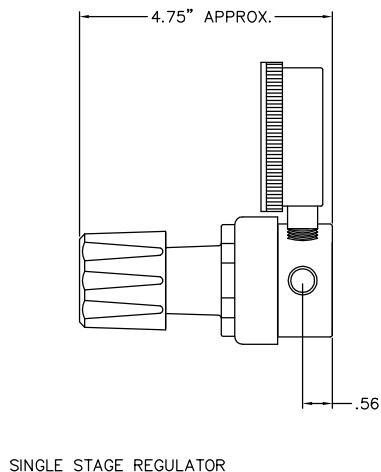
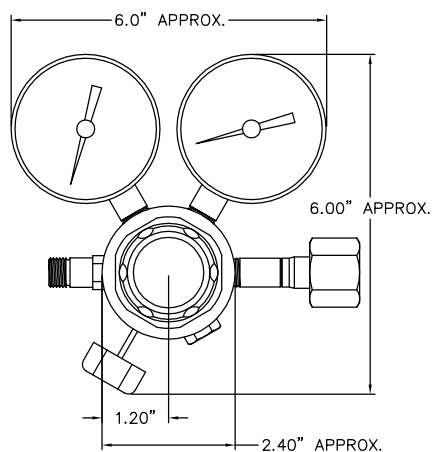
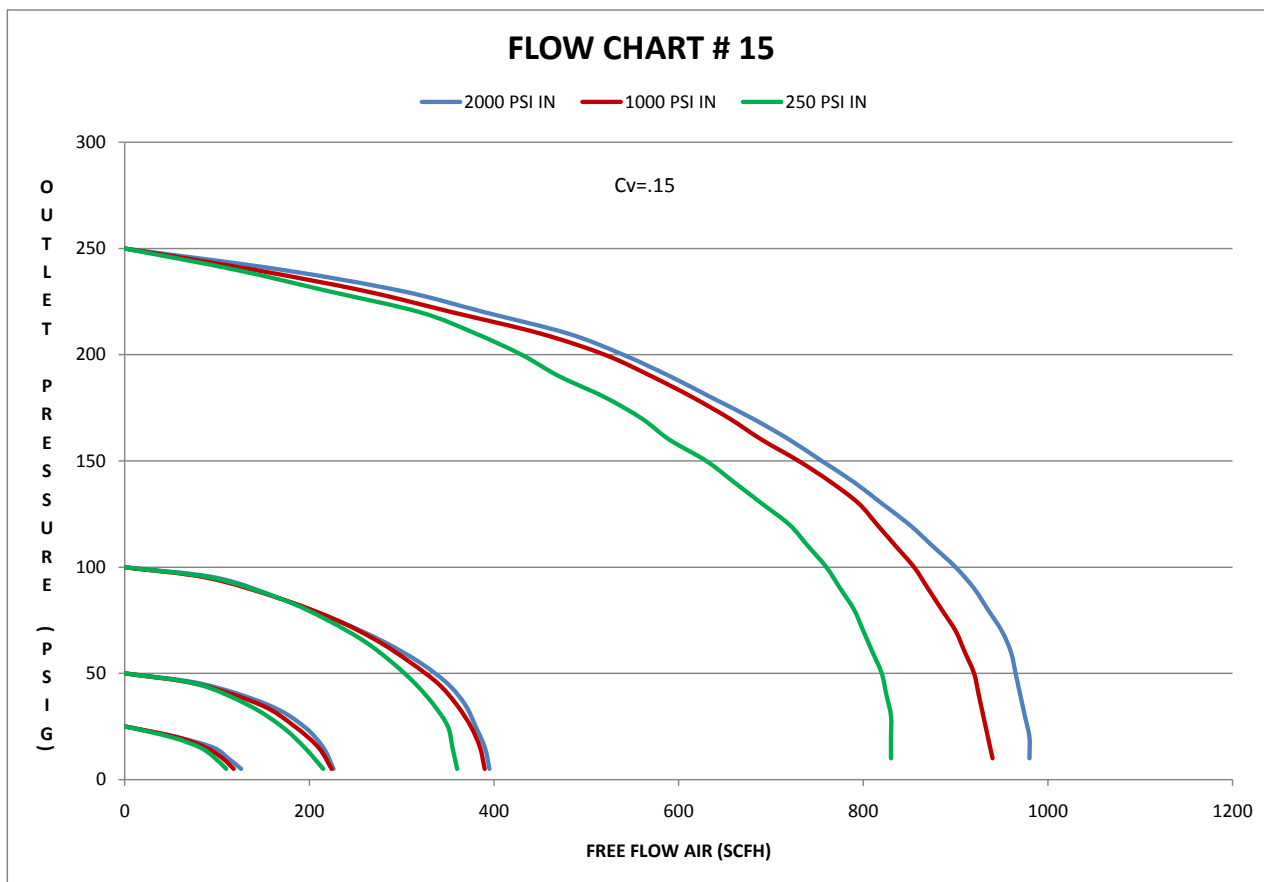
Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Type	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-215AOX	Brass	3,000	25	280	75	Single Stage	0-3,000	0-30
Y11-215BOX	Brass	3,000	50	850	150	Single Stage	0-3,000	0-60
Y11-215DOX	Brass	3,000	100	1,500	150	Single Stage	0-3,000	0-200
Y11-215FOX	Brass	3,000	200	1,950	350	Single Stage	0-3,000	0-400

Available Options

Product Number	Description
Y33-1FARH	Flash Arrestor

*These regulators are not certified for use with gas for human consumption.



PRESSURE REGULATORS

Special Service



Design Features

Filtered Seat

for added gas stream purity and extended service life.

Unique, Bronze-Filled PTFE Seat Design

reduces the risk of ignition from a chemical reaction.

Monel Metal Construction

provides excellent corrosion resistance and is ideally suited for strong oxidizers such as fluorine.

Large, 2 1/2" Monel Gauges

permit easy, accurate reading.

Degreased and Passivated

allows for immediate use in fluorine service.

Fluorine Service Models

Description: These regulators have been designed, constructed, and tested specifically for fluorine service. Since fluorine is a highly reactive element and a strong oxidizer, it is necessary to take special care in the design and construction of fluorine handling equipment.

These regulators feature a specially designed, bronze-filled PTFE seat, encased in a Monel housing. This significantly reduces non-metallic exposure to the wetted stream, thus reducing the risk of ignition.

All wetted parts are constructed of Monel metal, Iconel®, or bronze-filled PTFE materials and are protected by a 10-micron, sintered Monel filter. The regulator is degreased, passivated, and ready for immediate use in fluorine service.

Specifications

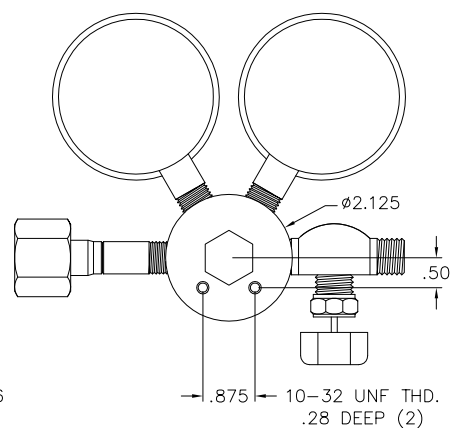
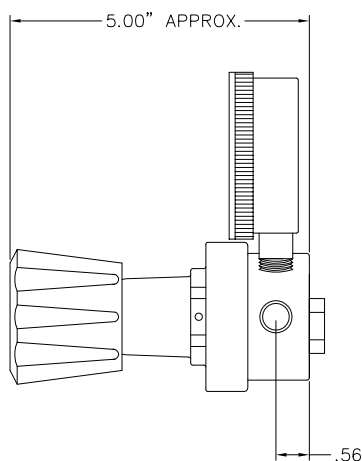
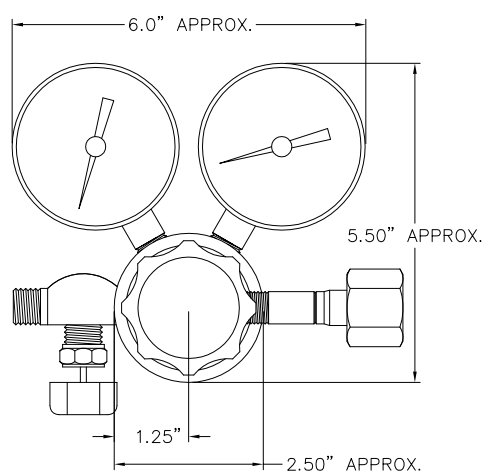
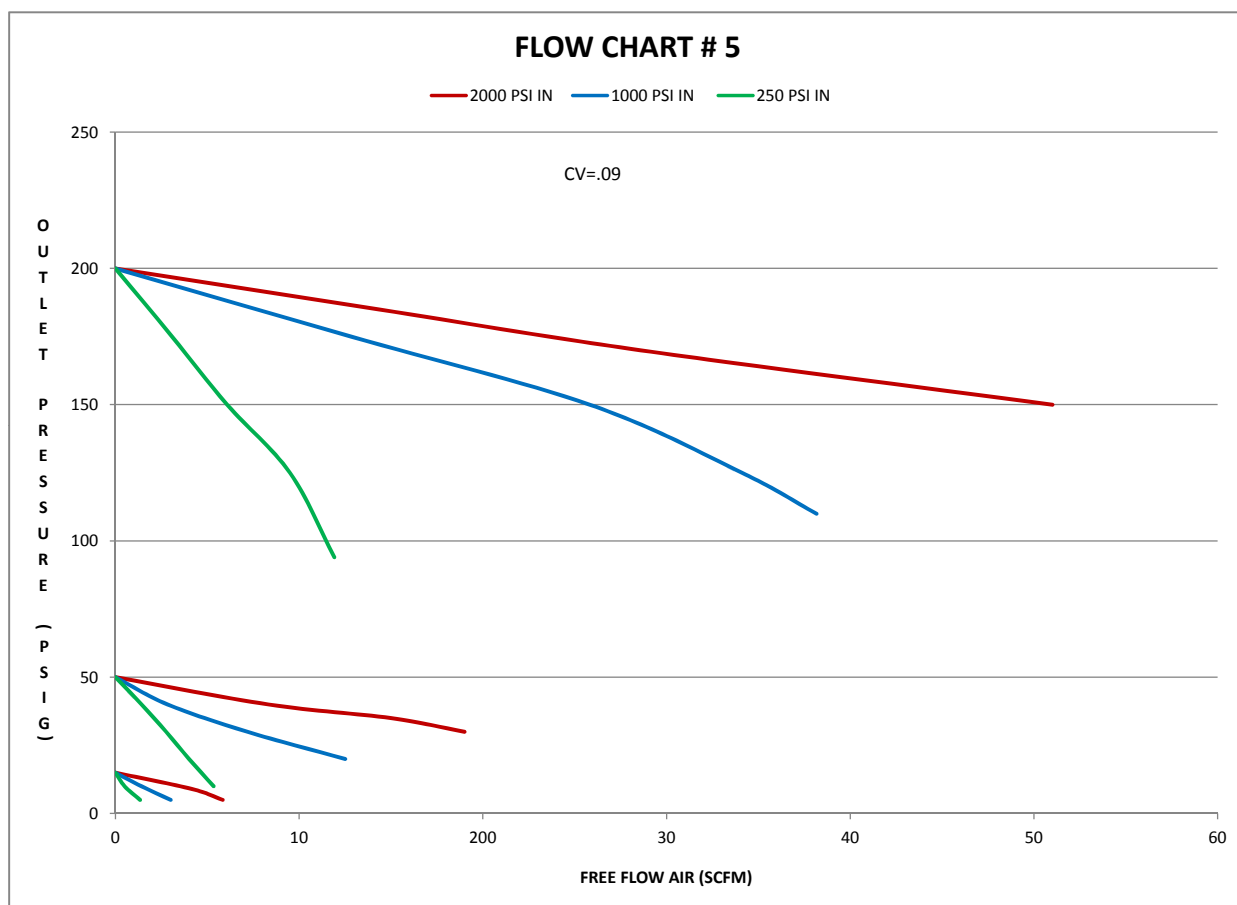
Maximum Rated Inlet Pressure	1,000 psig
Outlet Pressure Ranges	0-50 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	6 lbs
Ports (4)	1/4" FNPT
Outlet	1/4" MNPT
Decay Inlet Characteristic	0.35/100 psi

Materials

Body	Monel
Bonnet	Nickel-Plated Brass
Seat	Bronze-Filled PTFE
Diaphragm	Monel
Gauges	2 1/2" Monel
Filter	Sintered Monel
Valve Stem	Monel
Valve Spring	Iconel®
Outlet Valve	Monel
Trim	Monel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-F3321(670/679)	Monel	1,000	50	250	0-1,000	0-500



SINGLE STAGE REGULATOR

Incubator Regulator

Description: This unique two stage-regulator is specifically design for CO₂ service to provide gas to incubators. The regulator may also be used for the nitrogen gas supply as well.

The two-stage design eliminates troublesome freezing when CO₂ is flowing due to the Jules Thompson effect. This regulator has a cartridge seat assembly to provide better flow characteristics and long life.

Incubator Regulator

SPECIALTY REGULATORS



Specifications	
Maximum Rated Inlet Pressure	3500 psig
Outlet Pressure Ranges	0-25, 0-50 psig
Flow Capacity	Cv=0.19
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble Tight (helium)
Weight	4 LBS
Ports (4)	¼ " FNPT
Outlet	¼ " Hose Barb
Decay Inlet Characteristic	0.42/100 psi

Design Features

Filtered seat

For added gas stream purity and extended service life

Large, Reinforced Diaphragms

Provide precise pressure control

Large, 2" Black Painted, Steel Case Gauges

Dual Scale for easy pressure setting.

Preset Safety Relief Valve

Prevents excessive pressure buildup

Brass Bar Stock Body

Provides long-lasting good looks; will not tarnish

Materials

Body	Brass
Bonnet	Glass filled nylon
Seat	PFA
Diaphragm	Neoprene
Gauge	Steel painted case
Filters	Stainless steel and bronze

Ordering Information

Product Number	Gas Service	Material	MAWP	Outlet Pressure	Inlet Gauge	Outlet Gauge
Y12-200A320	CO ₂	Brass	3,500	25 psig	0-4,000 psig	0 – 30 psig
Y12-200B320	CO ₂	Brass	3,500	50 psig	0-4,000 psig	0 – 100 psig

Pressure Regulators- Specialty Application Regulators

Special Service Pressure Regulator

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Pressure Regulators – Specialty Application Regulators Special Service Pressure Regulator

Vacuum Flow Regulator

High Purity – Vacuum Actuated

REGULATORS

Description: The Airgas single-stage vacuum-actuated pressure regulator is designed for use with instruments that utilize a pump to draw calibration gas. This regulator will provide the exact amount of gas that the instrument requires. The simple-to-use regulator makes calibration quick and easy by eliminating the need for sample bags, flow meters and /or special training.



Design Features

Compact size

Small and light weight

Designed specially for instruments

utilizing a pump to draw up to 8" of water column pressure with a flow rate of 0-8 lpm of calibration gas

Specifications

Inlet Pressure	See table below
Operating Temperature Range	-20°F to 140°F (-28°C to 60°C)
Demand Pressure	8" H2O
Regulator Inlet Connection	¼" NPT female or C10
Outlet Connection	⅜" Barb
Gauge Size	1.5"
Shipping Weight	0.5 lbs

Materials

Regulator Body	Aluminum / Stainless Steel
Diaphragm	Buna-N / Viton
Seat	PTFE
Seal	EPDM/Viton
Bonnet	Clear Anodized Aluminum
Gauge	Stainless Steel / Brass

Ordering Information

Product Number	Body Material	Diaphragm Material	Inlet Connection	Gauge Material	O-Ring Material	Inlet Pressure Gauge (psig)	Inlet Pressure (psig)
Y11-2900(CGA)	Alum	Buna-N	¼" NPT Female	Brass	Viton	0-3000	3000
Y11-2900C10	Alum	Buna-N	C10	Brass	Viton	0-1200	1000
Y11-4900(CGA)	Alum	Viton	¼" NPT Female	Stainless Steel	Viton	0-3000	3000
Y11-4900C10	Alum	Viton	C10	Stainless Steel	Viton	0-1200	1000
Y11-5900(CGA)	Alum	Buna-N	¼" NPT Female	Stainless Steel	EPDM	0-3000	3000
Y11-5900C10	Alum	Buna-N	C10	Stainless Steel	EPDM	0-1200	1000
Y11-6900(CGA)	SS	Buna-N	¼" NPT Female	Stainless Steel	EPDM	0-3000	3000
Y11-6900C10	SS	Buna-N	C10	Stainless Steel	EPDM	0-1200	1000
Y11-7900(CGA)	SS	Viton	1/4" NPT Female	Stainless Steel	Viton	0-3000	3000
Y11-7900C10	SS	Viton	C10	Stainless Steel	Viton	0-1200	1000

Four-Stage Analytical Regulators

Description: Regulation of gas from high to low pressure generally results in a temperature drop inside the regulator. The larger the pressure drop ($P_1 - P_2 = P_d$), the greater the cooling effect. This is commonly known as Joule-Thompson (J-T) cooling effect. The J-T effect may subject the gas mixture to temperatures below the dew point of one or more components, resulting in separation and altering the composition of the mixture.

A common solution to maintain gas temperature above the dew point when regulating condensable calibration mixtures is to use an electrically-heated regulator. These regulators will maintain the gas temperature above the mixture dew point, however, their use can pose other operational and intrinsic issues such as: 1) the need for an electric power source (not so portable); 2) an explosion-proof rating (high cost and not portable) for use with flammable mixtures; and 3) inherently large temperature swings caused by wide heating cycles (common with electrically-controlled heated regulators) resulting in inconsistent analytical results.

The Airgas Model 144 regulator reduces cylinder pressure in four stages. The design incorporates three piston-sensed stages and a final fourth adjustable pressure stage with an Elgiloy® metal diaphragm. This technology provides distribution of the J-T cooling effect between multiple stages. As a result, reduction in cooling maintains gas temperatures above the dew point in the pressure regulator while preserving the mixture composition and achieving stable analytical results.



Design Features

- Four stages** reduce J-T cooling effect and maintains mixture composition
- Check valve cylinder connection** prevents air and contaminants from entering the gas stream during cylinder change out
- Diaphragm seal outlet valve** provides for flow shut-off and maintains gas purity
- Compact and light weight design** provides for easy transport
- No electricity** required allows for portability and use with flammable gases
- Pressure gauges** monitor cylinder and delivery pressures

Specifications

Inlet Pressure	3000 psig (207 bar) maximum and rated
Outlet Pressure Ranges	0 – 30 psig (2.1 bar), 0 – 75 psig (5.2 bar)
Flow Capacity	CV = 0.014
Operating Temperature	-40°F to 140°F (-40°C to 60°C) ambient
Designed Leak Rate	Bubble-tight (helium)
Decay Inlet Characteristic	0.4/100 psi
Regulator Inlet Port	1/4" NPT Female
Inlet Connection	Specify CGA
Outlet (Regulator Body)	1/8" NPT Female
Outlet Connection	1/4" NPT Female on outlet valve
Ports (4)	1/8" NPT Female
Inlet Filter	40 micron
Gauge	1.5" (41 mm) face
Weight	2 lbs.

Materials

Body, Pistons, Gauges	316 Stainless Steel
Diaphragm (4th Stage)	Elgiloy®
Seats	PFA
Seals	PTFE and Viton®
Bonnet	Brass nickel-plated
Filter	316 Stainless Steel

Ordering Information

Product Number	Material	Inlet Pressure (maximum)		Outlet Pressure (maximum)		Inlet Gauge		Delivery Gauge	
		psig	bar	psig	bar	psig	bar	psig	bar
Y12-1144A(CGA)-AL	316 Stainless Steel	3000	207	30	2.1	0 – 3000	0 – 207	0 – 60	0 – 4.1
Y12-1144B(CGA)-AL	316 Stainless Steel	3000	207	75	5.2	0 – 3000	0 – 207	0 – 100	0 – 6.9

* Specify CGA. Insert appropriate Compressed Gas Association connection number to complete the product number.
Example: Y12-1144A350-AL. Order by complete product number.

Incubator Regulator

Description: This unique two stage-regulator is specifically design for CO₂ service to provide gas to incubators. The regulator may also be used for the nitrogen gas supply as well.

The two-stage design eliminates troublesome freezing when CO₂ is flowing due to the Jules Thompson effect. This regulator has a cartridge seat assembly to provide better flow characteristics and long life.

Incubator Regulator

SPECIALTY REGULATORS



Specifications	
Maximum Rated Inlet Pressure	3500 psig
Outlet Pressure Ranges	0-25, 0-50 psig
Flow Capacity	Cv=0.19
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble Tight (helium)
Weight	4 LBS
Ports (4)	¼ " FNPT
Outlet	¼ " Hose Barb
Decay Inlet Characteristic	0.42/100 psi

Design Features

- Filtered seat**
For added gas stream purity and extended service life
- Large, Reinforced Diaphragms**
Provide precise pressure control
- Large, 2" Black Painted, Steel Case Gauges**
Dual Scale for easy pressure setting.
- Preset Safety Relief Valve**
Prevents excessive pressure buildup
- Brass Bar Stock Body**
Provides long-lasting good looks; will not tarnish

Materials

Body	Brass
Bonnet	Glass filled nylon
Seat	PFA
Diaphragm	Neoprene
Gauge	Steel painted case
Filters	Stainless steel and bronze

Ordering Information

Product Number	Gas Service	Material	MAWP	Outlet Pressure	Inlet Gauge	Outlet Gauge
Y12-200A320	CO ₂	Brass	3,500	25 psig	0-4,000 psig	0 – 30 psig
Y12-200B320	CO ₂	Brass	3,500	50 psig	0-4,000 psig	0 – 100 psig

Internally Coated Stainless Steel Two-Stage Model

Description: This two-stage stainless steel, high-purity regulator has been designed to provide precise pressure regulation for the Airgas EPA Protocol Mercury Standards. The two-stage body, diaphragms, internal carriers, internal compression members, 0.06 Cv poppets, conical compression springs, 1/4" compression fitting and CGA 660 nipple are all passivated using a proprietary coating. This unique coating mitigates the chances of any level of mercury attaching to the internal wetted components of this specialty regulator. The result is a two-stage pressure regulator that will not hold back or alter any level (PPM or PPB) of the mercury standard.

The internal threadless seat design of the two-stage stainless steel regulator is the same as used in our high-purity Y12-C445 series. The convoluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. An outlet 1/4" compression fitting is provided to maintain optimum system purity.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	2-30 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150°F
Designed Leak Rate	2x10 ⁻⁸ ccs (helium)
Weight	4 lbs
Outlet	1/4" TOD Compression Fitting
Decay Inlet Characteristics	0.01/100 psi

Materials	
Body	316 Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve & Fitting	316 Stainless Steel
Trim	316 Stainless Steel

Single-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-HG445A660	316 SS	4,000	30	190	0 - 4000	30"Hg -0-30

Mercury Standards

PRESSURE REGULATORS



Design Features

- **Unique Proprietary Passivation Process**
special coating prevents mercury from "sticking" to the internal wetted components of the stainless steel regulator
- **Convoluted Hastelloy C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal
- **Threadless Seat Design**
provides longer regulator life

Transformer Regulator

SPECIAL SERVICE REGULATOR

Electrical Transformer Regulator

Description: These special purpose preset regulator are specially designed to deliver highly accurate consistent low pressure supply of nitrogen to oil filled power sub-station transformers. This new design consists of a two-stage preset regulator connected to a highly sensitive single-stage regulator that will deliver and maintain 0.50 PSIG in the head space within the transformer. A built in self relieving valve set at 8 PSIG protects the system from over-pressurization due to temperature variation. Both models come with bypass pressure valve allowing for rapid filling of the transformer at 6 PSIG of pressure. Regulator 16347-3 is constructed with an electrical switch that may be wired to an alarm or light to alert the operator when the cylinder pressure drops below 250 psig.



Electronic gauge version alerts when tank pressure falls below 250 psi



16391 Specifications	3 Year Limited Warranty
Maximum Input Pressure	3000 PSIG
Delivery (Outlet) Pressure Range	0.4 to .6 PSIG
Outlet Fitting	½" FNPT
Purge Valve	Nickel Plated Brass Needle Valve
Purge Valve Outlet	¼" MNPT
Inlet Cylinder Connection	580 CGA
Operating temperature range	-40°F to +160°F

16347-3 Three-stage, electronic gauge, Nitrogen Regulator

Design Features

- Load : 5 amps, 125 or 250V AC
- Temperature: - 40° to 180° F
- Switch type: NO/NC (DPDT)
- (3) 18" Flying Leads
- Pressure switch range 75 to 300 PSI
- Factory Preset @250 PSI
- All other specifications are identical to the 16361 Regulator

Application

Low pressure gas blanketing of oil filled sub-station power transformers.

Pre-set Outlet Pressures

Description

Stage 1 @ 150 PSIG into 2nd Stage
Stage 2 @ 8 PSIG into 3rd Stage
Stage 3 @ .4 to .6 PSIG outlet pressure
Purge Pressure: @ 6 PSIG

Ordering Information

Part Number	Description	Switch Gage
Y11-237350858A	Three-stage, electronic gauge, Nitrogen Regulator	Yes
Y11-237142958C	Three-stage, electronic gauge, Nitrogen Regulator	No

Severe Duty Stainless Steel Models

High Purity

PRESSURE REGULATORS

Description: The complete stainless steel construction of these regulators allows for the high-purity design to function in the most severe environments. Harsh corrosive environments which have high levels of sea salt, fluorides, unnaturally occurring chlorides, sulfides or other acidic/caustic elements in the ambient atmosphere will cause premature degradation of brass and most vinyl plastics. The near bullet-proof design of the Airgas Severe Duty Regulator provides exact pressure regulation while resisting the negative effects of a corrosive environment.

These regulators also have a check valve CGA that prevents contaminants from entering the gas stream during cylinder change out.

The internal threadless seat design of these single and two-stage stainless steel regulators is the same as used in our high-purity Y11-C444 & Y12-C445 series. The convoluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. A 1/4-turn packless diaphragm outlet valve with a 1/4" compression fitting is provided to maintain optimum system purity. Captured bonnet vent ports are plugged with sintered mufflers which minimize the negative corrosive effects on the control spring assemblies. The regulator bodies are ultrasonically cleaned for the most demanding high-purity service.



Design Features

- **Stainless Steel Bonnets**
provides superior protection against corrosive environments.
- **Metal Pressure Control Knob**
anodized to resist any premature degradation.
- **Convoluted Hastelloy C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal.
- **Integral Check Valve in CGA**
virtually eliminates atmospheric contamination that occurs during cylinder change out.
- **1/4 Turn Diaphragm Packless Outlet Valve**
provide metal-to-metal positive shutoff
1/4" compression outlet fitting
- **Threadless Seat Design**
provides longer regulator life

Materials

Body	316 Stainless Steel
Bonnet	303 Stainless Steel
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve & Fitting	316 Stainless Steel
Trim	316 Stainless Steel

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	2-30 psig, 3-60 psig, 4-100 psig, 5-250 psig
Ambient Operating Temperature	-40° F to +150°F
Designed Leak Rate	2 x 10 ⁻⁸ ccs (helium)
Weight	6 lbs.
Outlet	1/4" TOD Compression Fitting

Single-Stage Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-SD474A(CGA)	316 SS	4,000	30	900	0 - 4000	0-60
Y11-SD474B(CGA)	316 SS	4,000	60	1,250	0 - 4000	0-100
Y11-SD474D(CGA)	316 SS	4,000	100	1,750	0 - 4000	0-200
Y11-SD474F(CGA)	316 SS	4,000	250	2,700	0 - 4000	0-400

Two-Stage Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-SD474A(CGA)	316 SS	4,000	30	190	0 - 4000	0-60
Y12-SD474B(CGA)	316 SS	4,000	60	270	0 - 4000	0-100
Y12-SD474D(CGA)	316 SS	4,000	100	380	0 - 4000	0-200
Y12-SD474F(CGA)	316 SS	4,000	250	850	0 - 4000	0-400

Pressure Regulators- *Specialty Application Regulators*
Low Delivery Pressure

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Pressure Regulators – *Specialty Application Regulators* *Low Delivery Pressure*

Ultra-Low Delivery Pressure Models

Special Service

PRESSURE REGULATORS

Description: This two-stage regulator is recommended for use with non-corrosive gases in applications where an ultra-low delivery pressure is required. It maintains an accurate delivery pressure over the life of the cylinder. The two-stage design limits the variations in the outlet pressure to 0.06 psig for every 100 psig of inlet pressure decay. Made of durable, long-lasting forged brass and then chrome plated, this regulator is perfect for non-corrosive, ultra-low delivery pressure gases. A needle valve is included on the outlet.



Design Features

Large Elastimeric Diaphragms

deliver precise pressure control from full cylinder to almost empty.

Sintered Metal Filter

protects internal parts and extends service life.

Unique Delivery Gauge

provides 0.1 psi graduations on the 0 - 2 psi unit and 0.5 psi on the 0 - 6 psi unit.

Inter-Stage Relief Valve

protects second stage from over-pressurization.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0.06 - 2 psig/0.06-6 psig
Flow Capacity	Cv=.08
Ambient Operating Temperature	-20° F to +140° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	5 lbs
Ports (5)	1/4" FNPT
Outlet	1/4" NPT male
Decay Inlet Characteristic	0.03/100 psi

Materials	
Body	Brass
Bonnet	Brass
Diaphragm	1st Stage PTFE, 2nd Stage Neoprene
Gauges	2 1/2" Brass
Filter	Sintered Brass
Valve Stem	Brass
Valve Spring	302 Stainless Steel
1st Stage Seat	PTFE
2nd Stage Seat	Neoprene

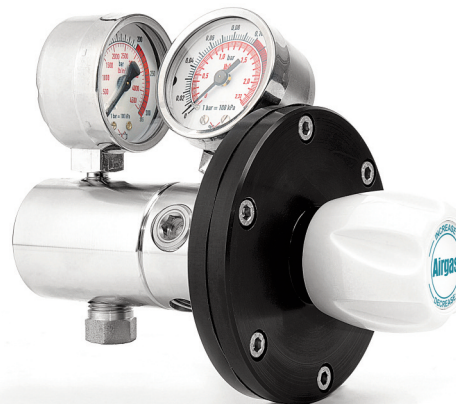
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-N175A(CGA)	Brass	3,000	2	100	1,200	0-4,000	0-5
Y12-N175B(CGA)	Brass	3,000	6	100	1,200	0-4,000	0-15

Very Low Delivery Pressure

Description: This Airgas two-stage regulator can be used with high purity mildly corrosive and non-corrosive gases. The large area second stage stainless steel diaphragm provides a sensing area that allows this regulator to provide a delivery pressure as low as 0.14 to 1.45 psig. The two stage design provides a constant delivery pressure to the application regardless of the change of the inlet pressure.

Special Services

PRESSURE REGULATORS



Specifications	
Maximum Rated Inlet Pressure	2900 psig
Outlet Pressure Range	0-1.45 psig
Flow Capacity	9 lpm N2 @ 2000 psig/CV = 0.057
Design Leak Rate	1 x 10 ⁻⁸ ccs (helium)
Weight	3.5 lbs
Ports (3)	1/4" NPT female
Inlet (1)	1/4" NPT female
Outlet (2)	1/4" NPT female

Materials	
Body	Chrome-Plated Brass or 316 Stainless Steel
Bonnet	Black Anodized Aluminum
Seat	PTFE
Seals	EPDM
Piston – 1st Stage	Brass or 316 Stainless Steel
Diaphragm – 2ndStage	304 Stainless Steel
Gauges	1 3/4" Chrome-Plated Brass or Stainless Steel

Design Features

Two-stage design ensures constant delivery pressure over the change of inlet pressure

Large 3.8" second stage diaphragm allows for accurate control down to 0.14 psig.

Ordering Information					
Product Number	Material	Max Inlet Pressure (psig)	Pressure Range (psig)	Inlet Gauge	Outlet Gauge
Y12-1LPA- (CGA)	Chrome-Plated Brass	2900	0.14 – 1.45	3000	2.3
Y12-4LPA- (CGA)	Stainless steel	2900	0.14 – 1.45	3000	2.3

PRESSURE REGULATORS

Special Service

Ultra-Low Inlet Pressure Models



Design Features

Oversized Diaphragm

provides sensitive, accurate, low-pressure control.

Remote Adjustment

prevents accidental outlet pressure change.

Large, 2 1/2" Gauge

permits accurate, easy reading.

Lightweight Construction

permits easy handling and installation.

Description: These regulators are specifically designed to provide sensitive, accurate, low-pressure control for laboratory applications. They feature an oversized “pancake” body of magnesium alloy with a Buna-N diaphragm. These regulators are typically used in conjunction with other high-pressure regulators or on house-line systems that limit inlet pressure to 250 psig (except on model N570K the inlet pressure limit is 10 psig). Regulators are adjusted easily by removing the knurled nut and turning the screw to alter the tension on the diaphragm.

Because these regulators are not typically recommended for direct connection to cylinders, they are provided with a 1/4" FNPT inlet port. Direct cylinder connection is only permissible when using liquefied compressed gases with vapor pressures below 250 psig such as 1,3-butadiene, n-butane, isobutane, isobutylene, propane, and propylene. With these products, a CGA 510 connection must be used.

Note: Inlet pressure should never exceed maximum recommended inlet pressure.

Specifications	
Maximum Rated Inlet Pressure	10-250 psig
Outlet Pressure Ranges	9" - 13", 1-5, 5-10 psig
Flow Capacity	Cv=0.002
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3 lbs
Ports (4)	1/4" FNPT
Outlet	1/4" FNPT

Materials	
Body	Magnesium Alloy
Bonnet	Magnesium Alloy
Diaphragm	Buna-N
Gauge	2 1/2" Brass
Nozzle	Brass
Linkage	316 Stainless Steel and Brass

Ordering Information							
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Setting (psig)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-N570K	Magnesium Alloy	10	9" - 13"	290	28"	No Gauge	No Gauge
Y11-N570L	Magnesium Alloy	250	1-5	750	12	No Gauge	0-15
Y11-N570M	Magnesium Alloy	250	5-10	1,000	No Gauge	No Gauge	0-15

* Water column pressure

Note: Model Y11-N570K does not include a gauge.

Pressure Regulators- *Specialty Application Regulators*
High Delivery Pressure

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



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Pressure Regulators – *Specialty Application Regulators High Delivery Pressure*

High Delivery Pressure Models

Description: Designed for a wide range of pressure settings, these single-stage regulators are recommended for use in petroleum field applications, research laboratories for hydrogenation, catalytic reduction, accelerated age testing, calorimetric testing, component testing, and pressure testing applications.

These regulators feature a rugged brass piston, which provides increased safety and reliability at high delivery pressures. A 25-micron inlet filter protects internal components.

Design Features

Rugged Brass Piston

provides increased safety and reliability at high delivery pressures.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of sensor O-ring failure.

Standard Threaded Bonnet (with optional collar mount nuts)

permits panel mounting.

Ultrasonic Cleaning

allows high-purity gas handling without costly pre-cleaning.

Special Service

PRESSURE REGULATORS



Y11-N198J/K
Y11-N114G
Y11-N115H



Y11-C198J
Y11-C198K

Specifications

Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	0-1000, 0-2,000, 0-4,000, 0-6,000 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-15° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	3 lbs
Ports (5)	1/4" FNPT
Outlet	1/4" MNPT Instrument Valve
Decay Inlet Characteristic	1.00/100 psi

Materials

Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Piston	Brass
Piston O-Ring	Viton-A®
Backup Ring	PTFE
Gauges	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Relief Valve Port	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-N114G(CGA)	Brass	3,000	1,500	2,500	No	0-4,000	0-2,000
Y11-N115H(CGA)	Brass	3,000	2,500	3,000	No	0-4,000	0-4,000
*Y11-N198J(CGA)	Brass	6,000	4,000	10,000	No	0-10,000	0-6,000
*Y11-N198K(CGA)	Brass	6,000	6,000	10,000	No	0-10,000	0-6,000
*Y11-C198J(CGA)	SS	10,000	4,000	10,000	No	0-10,000	0-6,000
*Y11-C198K(CGA)	SS	10,000	6,000	10,000	No	0-10,000	0-6,000
Y11-C114G(CGA)	SS	4,000	1000	1,270	No	0-4,000	0-2,000
Y11-C115H(CGA)	SS	6,000	2000	1,270	No	0-4,000	0-3,000

*Self venting

Available Options

Product Number	Description
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-CHROMNUT	Panel Mount Nut (2 required)
Y99-750BKT	Wall Mounting Bracket

PRESSURE REGULATORS

Special Service

Heavy-Duty High-Pressure



Design Features

Excellent Value

high quality and economically priced.

Bar Stock Body

affords low internal volume.

Large Non-corrosive Gauges

2 brass, shatter resistant polycarbonate lenses.

Wide Industry Applications

including chemical plant, airline charging carts, R&D laboratories.

Description: This series of Airgas® heavy-duty high-pressure cylinder regulators is recommended for use on cylinders or panel mounting with a wide variety of non-corrosive inert gases. This series is ideally suited for high-pressure testing, purging and charging, calibration kits, manufacturing processes and R&D laboratories.

The Airgas heavy-duty high-pressure cylinder regulator's piston sensor design provides structural reliability in high-pressure applications. The low torque control knob and self-relieving feature permit easy adjustment of pressure in closed or dead-end systems.

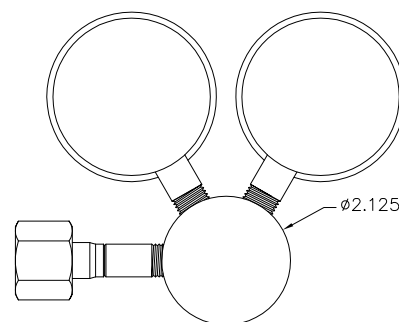
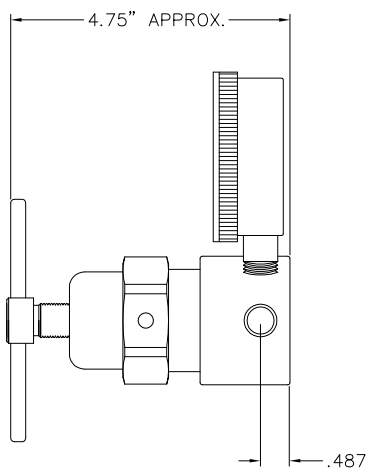
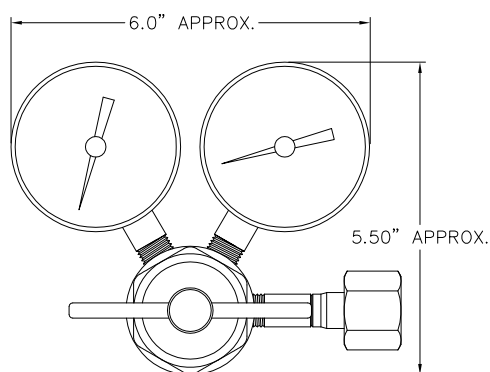
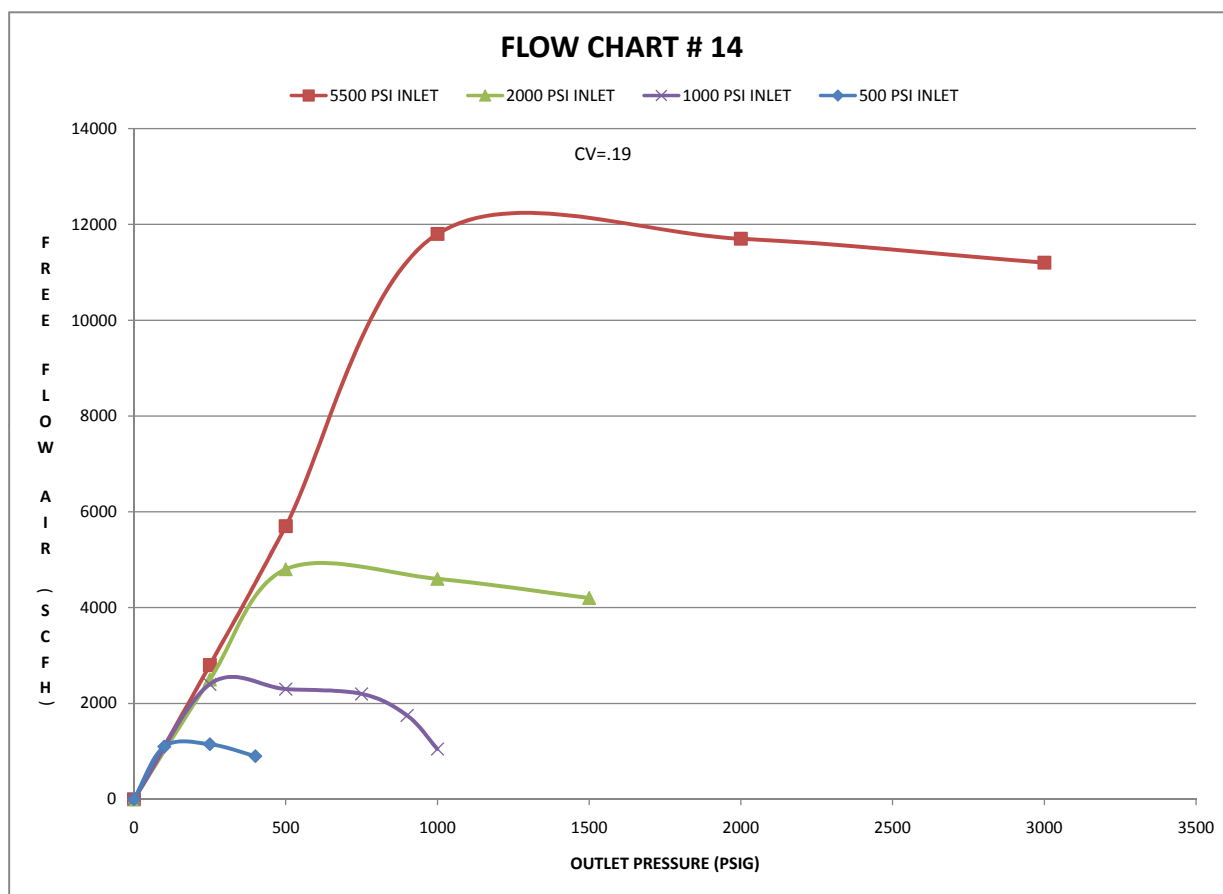
The 820 Series is configurable for most applications.

Specifications	
Maximum Rated Inlet Pressure	6,000 psig
Inlet Gauge Range	0–10,000 psig
Outlet Pressure Ranges	0–500, 0–2,000, 0–4,000, 0–6,000 psig
Outlet Gauge Range	0–1,000, 0–4,000, 0–6,000, 0–6,000 psig
Weight	8 lbs.
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT

Materials	
Body	Brass
Bonnet	Brass
Piston	Brass
Gauges	2 1/2" Brass, polycarbonate
Filter	316 Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	Nickel-Plated Brass

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Outlet Gauge Range (psig)
Y11-820G(CGA)	Brass	6,000	500	2,000	0–1,000
Y11-820H(CGA)	Brass	6,000	2,000	3,000	0–4,000
Y11-820J(CGA)	Brass	6,000	4,000	4,500	0–6,000
Y11-820K(CGA)	Brass	6,000	6,000	5,000	0–6,000



820 SERIES REGULATOR

Special Service Pressure Regulators- *Supelcoat*

Special Service Pressure Regulator - Supelcoat

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Product Reference Guide

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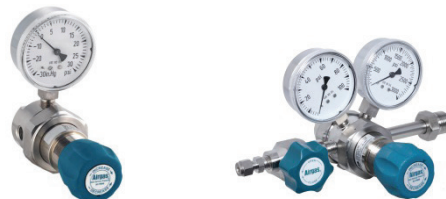
Cyclone Technology Regulators w/Supelcoat™

Airgas' unique line of Cyclone Technology pressure regulators are designed to preserve the specific gas mixture. These have a unique internal design to ensure all surfaces are continually swept, thus not allowing any dropout regardless of differences in specific weight of the various compounds within the mixture. These regulators also have a proprietary Supelcoat™ coating that prevent interaction of corrosive and volatile compounds in high purity gas mixtures used in EPA analysis.

This unique internal design and coating will prevent compounds like Mercury from sticking to the wetted surfaces of the regulator as the gas passes through. Also for chromatography processes where the gas cannot be compromised by any interaction, this organic coating provides a complete inert surface.

Pressure Regulators

REGULATORS



The coating does not allow for any loss of a component of a gas such as reactive like reduced sulfur compounds, ammonia, NO₂, HCl. Environmental testing processes where the gases would have formaldehyde and HF would also benefit from using these products.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100,
Flow Capacity	Cv = 0.25 line Cv=0.06 single two stage
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Ports (6)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials of Construction	
Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Design Features

- All internal surfaces are continuously sweep with the unique cyclone technology, ensures the gas mixture is maintained
- Exceptional speed in recovery of base line after cylinder change out, no need for long purging
- Low internal volume
- Enhances analytical applications in that the gas and components within a gas mixture will not react to the metal of the components that the gas comes in contact with
- Ensures compounds within the gas such as Mercury are not diluted due to interaction or sticking to untreated metal
- Offered in both single and two stage designs
- Convuluted Hastelloy C-22 Diaphragms provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports (with optional bonnet vent adaptors) allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet (with optional collar-mount nuts) for easy panel mounting.
- High-Flow Capacity permits excellent pressure control for multi-instrument applications.
- Threadless Seat Design provides longer regulator life.
- Shipped ready for use

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Cyclone Technology Regulators w/Supelcoat™

Pressure Regulators

REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Line Regulator						
Y11-C441ASC	316 SS	1,250	30	600	30" Hg-0-30	NA
Y11-C441BSC	316 SS	1,250	60	1,080	0-100	NA
Y11-C441CSC	316 SS	1,250	100	1,140	0-200	NA
Single Stage						
Y11-C444A (CGA)SC	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y11-C444B (CGA)SC	316 SS	4,000	60	270	0-4,000	0-100
Y11-C444D (CGA)SC	316 SS	4,000	100	380	0-4,000	0-200
Two Stage						
Y12-C445A (CGA)SC	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y12-C445B (CGA)SC	316 SS	4,000	60	270	0-4,000	0-100
Y12-C445D (CGA)SC	316 SS	4,000	100	380	0-4,000	0-200

Available Options	
Product Number	Description
Y99-CHROMNUTV	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y15-418984	Wall Mount Bracket Line Regulator
Y99-26460	1/4" MNPT x 1/4" Compression
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder single and two stage
Y15-QMS2	Quick Mounting Option for 2 Cylinders single and two stage

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



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Clever Quick-Mount Option

- Compact Gas Delivery Assembly

Description: The Clever Quick-Mount option enables a practical and safe wall-mounted installation of any Analytical, High Purity, or Ultra High Purity cylinder regulator. This allows right-out-of-the box installation of the regulator assembly onto a wall or existing structure. The convenient, compact design significantly minimizes the amount of valuable wall space normally required to wall mount regulators.

Clever Quick-Mount options include 30" stainless steel flexible pigtails, an appropriate wall-mount bracket, a stainless steel street elbow fitting, and a CGA connection with integrated check valve to prevent contaminants from entering the gas delivery supply during cylinder change out. The wall-mount brackets are fabricated from 304 stainless steel for durable, long-life service and are suitable for most environments and locations.

NOTE: Not available with Airgas General Purpose Series and Corrosive Service Regulators. Regulator is not included; must be ordered separately.

Specifications	
Max Rated Inlet Pressure	3500 psig
Outlet Pressure Range	-40°F to +165°F
Weight	3 lbs (added to weight of regulator)
Bracket	304 Stainless Steel
Pigtails	30" Corrugated Bellows, 316 Stainless Steel Flex



Design Features

Compact Design

minimizes valuable wall space required to wall-mount regulators

Convenient Installation

ready to mount right out of box

Increases Speed & Efficiency

eliminates the need to handle regulator during cylinder change-outs

Check Valve CGAs

prevents contaminants from entering gas stream

Ordering Information

Product Number	Regulator Series	No. Supply Cylinders
Y15-QMB1	244, N145, N245, T265	1
Y15-QMB2	244, N145, N245, T265	2
Y15-QMS1	E444, E464, C444, C445, CHP444, CHP445	1
Y15-QMS2	E444, E464, C444, C445, CHP444, CHP445	2

Available Options

Product Number	Description
Y99-4801201	Block and Vent Assembly; contains and removes all contaminants from entering gas stream
Y99-4EFV(xxx)	Excess Flow Shut-Off Valve; pressure/flow limit must be specified
Y15-4P72K1C	Option for 6 foot pigtail for single cylinder
Y15-4P72K2C	Option for 6 foot pigtail for two cylinders

Protocol Stations

Gas Manifold Assemblies

MANIFOLDS

Description: These single- and two-station manifolds (also known as “protocol stations”) are designed to provide a safe, reliable method of wall-mounting a single cylinder regulator, eliminating the need to handle the regulator during cylinder change out. Brackets are fabricated from 304 stainless steel for durable, long-life service and are suitable for connecting most single- and two-stage regulators. Easily mount to wall or existing structure.

Manifolds are provided with 30" stainless steel (corrugated bellows) flexible pigtails and CGA connections with check valves to prevent contaminants from entering during cylinder change-out.



Specifications/Materials	
Maximum Rated Inlet Pressure	3,000 psig
Ambient Operating Temperature	-60° F to +200° F
Weight	4 lbs
Pigtails	30" Stainless Steel Corrugated Bellows
Bracket	304 Stainless Steel
Fittings	Nickel-Plated Brass or Stainless Steel

Ordering Information		
Product Number	Material	Cylinders
Y15-1MBH(CGA)	Brass	1
Y15-12CMH(CGA)	Brass	2
Y15-4MBH(CGA)	Stainless Steel	1
Y15-42CMH(CGA)	Stainless Steel	2

Available Options	
Product Number	Description
Y99-4801201	Block and Vent Assembly; contains and removes all contaminants from entering gas stream
Y99-4EFV(xxx)	Excess Flow Shut-Off Valve; pressure/low limit must be specified
Y15-4P72K1C	Option for 6 foot pigtail for single cylinder
Y15-4P72K2C	Option for 6 foot pigtail for two cylinders

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



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Manifold Changeover Systems

Airgas® supplies manifolds for most applications of our common gases, fed from cylinders or dewars. Manifolds for single or multiple cylinders or dewars have been designed for analytical, medical, industrial, high-purity, and semiconductor applications. Airgas gas manifold systems help maximize safety and reliability, while providing a constant supply of gas to the process. They also eliminate storage space at individual workstations and labor needed to constantly replace cylinders. Airgas also offers a complete line of gas generators that can provide any analytical application with a continuous supply of gas.

Design

Airgas manifolds are designed to meet all applicable codes and applications. All manifolds are designed and tested to ASTM's section ANSI B31.3. All medical manifolds meet current NFPA 99 standards. Flammable systems meet the applicable NFPA codes. Airgas manifolds assure gas stream purity, delivering the same quality gas as certified at the cylinder fill location. Manifolds are specifically designed for the various applications our gases are used for. Systems have purge capabilities incorporated. Purge capabilities can be added to systems that do not have this capability as a standard option.

Benefits

Uninterrupted Gas Supply

Centralized gas supply eliminates costly interruptions and wasted manpower to install and replace cylinders at individual workstations.

Gas Savings

Manifolds ensure that cylinders are uniformly emptied. Operators will not return cylinders still containing usable gases. This can be a substantial savings in analytical and high-purity applications.

Space Savings

A centrally located manifold eliminates the space necessary for cylinders and handling equipment at each workstation. This is especially true in laboratory applications.

Safety

Cylinder handling can be controlled and confined to one area. Cylinder hazards at the workstation are eliminated.

Cylinder Savings

A manifold can reduce the number of cylinders required to maintain proper gas supply by 25% to 50%. This, in turn, reduces the amount of required regulating equipment and maintenance.

Standard Manifolds

Airgas' line of standard manifolds is the most comprehensive in the industry. Our manifolds offer readily available solutions to your manifold needs in analytical, high-purity and semiconductor applications.

Standard Features for Flexibility and Efficiency

Standard Materials

Standard manifolds may be ordered in brass and 316 stainless steel.

Standard Options

Many options such as safety relief valves, pressure switches, and alarm panels may be added to your manifold at time of order.

Built-in Flexibility

Modular construction makes adding additional cylinders easy with retrofit kits.

Delivery

Airgas manifolds are built at our Specialty Gas Equipment Center in Taylors, South Carolina. Two- and four- cylinder changeover panels are part of our 24-hour delivery program. Six- and eight-cylinder units are shipped in 2–3 days.

Reliable Price

Airgas can meet with all of your manifold needs, with the most competitive pricing in the industry and fast delivery.

Technical Information

Contact Airgas National Technical Services Support at **1-877-ASG-4-GAS**.

Lab Series Analytical Changeover Manifold

Description: This analytical/life science automatic changeover manifold is an economical version that provides an uninterrupted supply of gas to your GC laboratory or life science applications. It is ideally suited for all laboratory gases, including CO₂, and will maintain the purity while continuously supplying gas to your processes.

These manifolds come with an adjustable outlet pressure regulator and 30" flexible pigtails with a check valve CGA. The stainless steel diaphragm makes it ideal for analytical applications.

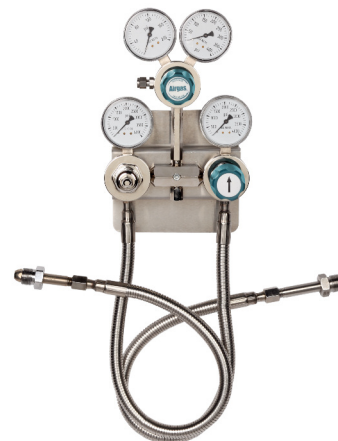
This unit has higher flow capabilities than our Economy Series and other similar units in the market. Its basic design makes it a very economical unit that will provide years of service at a low price. CO₂ units have the capability for high flows, but to attain these flows an optional heater will be required. Call our technical support staff at 800-939-5711 to help you specify the correct unit. These systems can also have alarms installed. Please contact customer service for the correct part numbers and options.

Notes: there are no shut-off or purge valves in the Lab Series system. They may be added as an option; or, consider our High Purity Changeover Panels. The High Purity Changeover Panels have these valves incorporated into their design.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Maximum Outlet Pressure	0-50, 0-125, 0-250 psig
Flow Capacity	Cv=.13
Ambient Operating Temperature	-40° F to +140° F (-38° C to 60° C)
Designed Leak Rate	1x10 ⁻⁵ ssc/sec
Weight	10.4 lbs
Ports	1/4" FNPT
Outlet	1/4" compression
Gauges	2 1/2" diameter

Lab Series

CHANGE OVER MANIFOLD ANALYTICAL SERIES



Design Features

- User-friendly Priority Valve**
One knob switches cylinder priority
- Check valves in CGA nipples**
Prevents contamination and back flow
- Line regulator**
Assures stable line pressure during changeover
- Large 2 1/2" single scale gauges**
For easy monitoring of pressure settings
- Nickel plated regulators**
Provide corrosion resistance and easy cleanup
- Safety Relief with captured port**
To vent relief away from work area
- Encapsulated Filtered seat**
Provides protection from seat contamination
- Inner stage pressure gauge**
For easy monitoring of switch over pressures

Materials

Body	Nickel-Plated Brass bar stock
Seats	PTFE
Diaphragm	316L Stainless Steel
Gauges	Nickel-Plated Brass
Filter	25 Micron Stainless Steel
Seals	Viton

Ordering Information

Product Number	Material	Number of Cyl	Delivery Pressure PSI	Flow Capacity CO ₂	Flow Capacity Air	Inlet Gauge Range (psig)	Outlet Gauge Range (psig)
Y11-CP720B(CGA)	Brass	2	10 - 50	400 scfh	500 scfh	0 - 4,000	0 - 100
Y11-CP740B(CGA)	Brass	4	10 - 50	400 scfh	500 scfh	0 - 4,000	0 - 100
Y11-CP760B(CGA)	Brass	6	10 - 50	400 scfh	500 scfh	0 - 4,000	0 - 100
Y11-CP780B(CGA)	Brass	8	10 - 50	400 scfh	500 scfh	0 - 4,000	0 - 100
Y11-CP720D(CGA)	Brass	2	10 - 125	700 scfh	875 scfh	0 - 4,000	0 - 200
Y11-CP740D(CGA)	Brass	4	10 - 125	700 scfh	875 scfh	0 - 4,000	0 - 200
Y11-CP760D(CGA)	Brass	6	10 - 125	700 scfh	875 scfh	0 - 4,000	0 - 200
Y11-CP780D(CGA)	Brass	8	10 - 125	700 scfh	875 scfh	0 - 4,000	0 - 200
Y11-CP720F(CGA)	Brass	2	10 - 250	800 scfh	950 scfh	0 - 4,000	0 - 400
Y11-CP740F(CGA)	Brass	4	10 - 250	800 scfh	950 scfh	0 - 4,000	0 - 400
Y11-CP760F(CGA)	Brass	6	10 - 250	800 scfh	950 scfh	0 - 4,000	0 - 400
Y11-CP780F(CGA)	Brass	8	10 - 250	800 scfh	950 scfh	0 - 4,000	0 - 400

Lab Series Analytical Changeover
Manifold Cont.

Lab Series

CHANGE OVER MANIFOLD ANALYTICAL SERIES

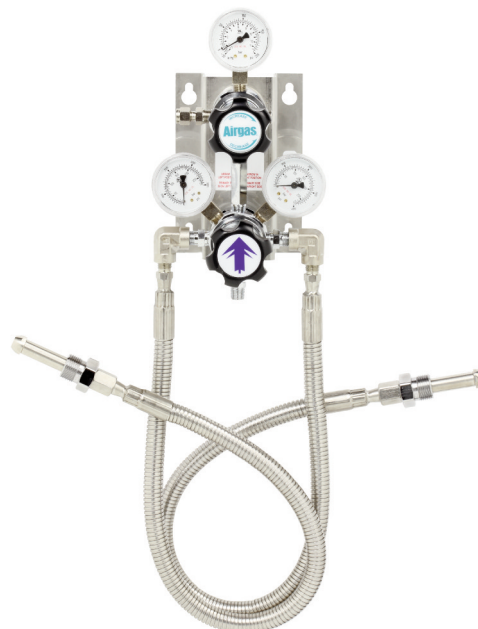
	Available Options	
	Product Number	Description
	Y15-4P72K2C	6 foot pigtail upgrade option, 2 cylinders
	Y15-4P72K4C	6 foot pigtail upgrade option, 4 cylinders
	Y15-4P72K6C	6 foot pigtail upgrade option, 6 cylinders
	Y78-820ALPK	Non-Flammable Alarm Package

Economy Automatic Switchover Regulator

Description: The Airgas® Economy Switchover System is part of our new Analytical Series of products for analytical and Life Science applications. It is a low-cost automatic switchover system designed to supply a continuous supply of high purity, non-corrosive gas. Due to the pressure differential considerations, an integral line regulator is used to maintain constant downstream pressure. The pigtails are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves.

The 6- and 8-cylinder models use our block manifold header as standard. Heaters are standard on unit with 320 CGA's for CO2 service rate for 165 scfh flow.

Note: There are no shut-off or purge valves in the Economy Series system. They may be added as an option, or, consider our High-Purity Changeover Panels. The High-Purity Changeover Panels have these valves incorporated into their design.



Design Features

Metal-to-metal diaphragm seal

no possibility of gas contamination

User-friendly priority valve

one knob switches cylinder priority

Check valves in CGA nipples

prevents contamination and back flow

Line regulator

assures stable line pressure during changeover

Materials

Body	Brass barstock, 316 Stainless Steel
Seat	PTFE
Diaphragm	316L Stainless Steel
Gauges	Nickel Plated Brass, 316 Stainless Steel
Filter	10 micron
Seals	PTFE

Specifications

Maximum Rated Inlet Pressure	3000 psig
Maximum Outlet Pressure	0-50, 0-125, 0-250, 0-500 psig
Flow Capacity	Cv=0.05
Ambient Operating Temperature	-40° F to 140° F (-38° C to 60° C)
Designed Leak Rate	1 x 10 ⁻⁸ scc/sec
Weight	10 lbs.
Ports	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Gauges	2" diameter
Alarm	Y78-820ALPK

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP802B(CGA)	2	Brass	3000	10-50	200	0-3000
Y11-CP804B(CGA)	4	Brass	3000	10-50	200	0-3000
Y11-CP806B(CGA)	6	Brass	3000	10-50	200	0-3000
Y11-CP808B(CGA)	8	Brass	3000	10-50	200	0-3000
Y11-CP802D(CGA)	2	Brass	3000	10-125	300	0-3000
Y11-CP804D(CGA)	4	Brass	3000	10-125	300	0-3000
Y11-CP806D(CGA)	6	Brass	3000	10-125	300	0-3000
Y11-CP808D(CGA)	8	Brass	3000	10-125	300	0-3000
Y11-CP802E(CGA)	2	Brass	3000	10-250	400	0-3000
Y11-CP804E(CGA)	4	Brass	3000	10-250	400	0-3000
Y11-CP806E(CGA)	6	Brass	3000	10-250	400	0-3000
Y11-CP808E(CGA)	8	Brass	3000	10-250	400	0-3000
Y11-CP120A 510*	2	Brass	250	15	90	0-3000
Y11-CP120G(CGA)	2	Brass	3000	10-500	900	0-3000

*Uses synflex® hoses; acetylene specific changeover.

Economy Automatic Switchover
Regulator Cont.

Economy

CHANGEOVER MANIFOLDS

Ordering Information						
Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP842B(CGA)	2	Stainless Steel	3000	10-50	200	0-3000
Y11-CP844B(CGA)	4	Stainless Steel	3000	10-50	200	0-3000
Y11-CP846B(CGA)	6	Stainless Steel	3000	10-50	200	0-3000
Y11-CP848B(CGA)	8	Stainless Steel	3000	10-50	200	0-3000
Y11-CP842D(CGA)	2	Stainless Steel	3000	10-125	300	0-3000
Y11-CP844D(CGA)	4	Stainless Steel	3000	10-125	300	0-3000
Y11-CP846D(CGA)	6	Stainless Steel	3000	10-125	300	0-3000
Y11-CP848D(CGA)	8	Stainless Steel	3000	10-125	300	0-3000
Y11-CP842E(CGA)	2	Stainless Steel	3000	10-250	400	0-3000
Y11-CP844E(CGA)	4	Stainless Steel	3000	10-250	400	0-3000
Y11-CP846E(CGA)	6	Stainless Steel	3000	10-250	400	0-3000
Y11-CP848E(CGA)	8	Stainless Steel	3000	10-250	400	0-3000

Available Options	
Product Number	Description
Y15-4P72K2C	6 foot pigtail upgrade option, 2 cylinders
Y15-4P72K4C	6 foot pigtail upgrade option, 4 cylinders
Y78-820ALPK	Non-Flammable Alarm Package

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



Airgas
You'll find it with us.™

10-100 psig Delivery 10-200 psig Delivery

This high-purity brass or stainless steel automatic changeover panel provides continuous, uninterrupted gas supply on installations where a reserve cylinder is used. The unit consists of two regulators built into one body – one side of the regulator delivering gas at a slightly higher pressure than the other regulator. When the service cylinder is empty, the unit automatically withdraws gas from the reserve cylinder, eliminating the need to shut down the system to replace empty cylinders. The indicating arrow on the regulator adjustment knob denotes which cylinder is in use. The high-purity design and components make this system ideally suited for chromatography and laboratory gas applications.

This system includes integrated check valves in the CGA connections that help eliminate atmospheric contamination during cylinder change out; optional block and bleed assemblies can be installed immediately downstream of the CGA connection to further mitigate the probability of contamination during cylinder change outs. All systems include five-sided mounting enclosure, pigtails, isolation valves and outlet shut-off valve.

Notes: For applications using portable cylinder banks, Airgas strongly recommends the 6-ft. pigtail option to facilitate the safe positioning of the banks in front of the manifold.

Design Features

- **Automatic Changeover** - provides uninterrupted high-purity gas supply.
- **Convuluted 316 Stainless Steel Diaphragms** - provide superior leak integrity without contamination from a non-metallic liner or seal.
- **Indicating Pressure Switch Inlet Gauges Standard** - magnetically actuated reed switch capable of operating low voltage annunciator, lights or displays switch point can be adjusted between 2% & 90% of full scale
- **Integral Check Valve in CGA** - virtually eliminates atmospheric contamination that occurs during cylinder change out.
- **Wall Mount Five-Sided Enclosed Panel** - protects piping, gauges & regulator bodies from direct weather. Open back allows for easy field service/repair permits easy on-site installation. Tear drop holes make for easy and quick installation.
- **36" Flexible Metal Pigtails** - stainless steel construction provides excellent diffusion and corrosion resistance high convolution count provides excellent flexibility cleaned for O2 Service; allows high purity system integrity

High Purity

Changeover Panels



Specifications	
Maximum Rated Inlet Pressure	3000 psig
Outlet Pressure Ranges	10-100 psig 10-200 psig
Flow Coefficient	Cv = 0.06
Flow Capacity	200 scfh @150 psig
Design Leak Rate	2 x 10 ⁻⁸ ccs
Weight	11 lbs
Ambient Operating Temperature	-40F to 150F
Inlet Connections	36" Stainless steel corrugated bellows with CGA check valves
Outlet Port	¼" compression

Materials	
Body	Brass or 316 Stainless Steel
Bonnet	Brass Bar Stock
Seat	PCTFE
Diaphragm	316 Stainless Steel
Gauges	Brass or Stainless Steel
Filters	40 Micron Stainless Steel

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Specialty Gas Equipment

Ordering Information

Product Number	Materials	No. Cyl	Delivery Pressure Range	Capacity (scfh @ Max Del Pressure)	Inlet Gauge Range	Outlet Gauge Range
Y11-ASCP120BR(CGA)	Brass	2	10-100	220	3000	200
Y11-ASCP140BR(CGA)	Brass	4	10-100	220	3000	200
Y11-ASCP160BR(CGA)	Brass	6	10-100	220	3000	200
Y11-ASCP180BR(CGA)	Brass	8	10-100	220	3000	200
Y11-ASCP420BR(CGA)	316 SS	2	10-100	220	3000	200
Y11-ASCP440BR(CGA)	316 SS	4	10-100	220	3000	200
Y11-ASCP460BR(CGA)	316 SS	6	10-100	220	3000	200
Y11-ASCP480BR(CGA)	316 SS	8	10-100	220	3000	200
Y11-ASCP120R(CGA)	Brass	2	10-200	220	3000	400
Y11-ASCP140R(CGA)	Brass	4	10-200	220	3000	400
Y11-ASCP160R(CGA)	Brass	6	10-200	220	3000	400
Y11-ASCP180R(CGA)	Brass	8	10-200	220	3000	400
Y11-ASCP420R(CGA)	316 SS	2	10-200	220	3000	400
Y11-ASCP440R(CGA)	316 SS	4	10-200	220	3000	400
Y11-ASCP460R(CGA)	316 SS	6	10-200	220	3000	400
Y11-ASCP480R(CGA)	316 SS	8	10-200	220	3000	400

Available Options

Product Number	Description
Y15-4P72K2C	6-ft pigtails for use with portable cylinder (2- cylinder kit)
Y15-4p72K4C	6-ft pigtails for use with portable cylinder (4 - cylinder kit)
Y99-BBCGA1K2	Block & Bleed assembly installed at CGA (2- cylinder kit)
Y99-BBCGA1K4	Block & Bleed assembly installed at CGA (4- cylinder kit)
Y78-EN200ALPK	Optional Alarm (Audio and Visual)
Y78-EXTCAB8	25 foot cable extender for alarm
Y78-EXTCAB15	50 foot cable extender for alarm
Y78-EXTCAB30	100 foot cable extender for alarm
Y78-EXTCAB40	130 foot cable extender for alarm

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Changeover Manifolds- Fully Auto Inert and Flammable Gases

Changeover Manifolds - Fully Auto Inert and Flammable Gases

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



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Fully Automatic System

Description: The Airgas® fully automatic high-purity manifold system is intrinsically safe and has an embedded micro-processor that electronically controls the uninterrupted gas supply, monitors the system for leaks, recognizes when you change out depleted cylinders and automatically re-sets itself to full standby status. A LCD panel displays cylinder contents and pipeline pressure readings with six-system status LEDs.

The advanced fully automatic manifold integrated circuit gives you the capability to monitor the system with optional local alarms, remote alarms, phone dialers or web based monitoring.

Design Features

- **Automatic Changeover**
re-sets automatically after cylinder change out.
- **Built-in Leak Detection**
Micro-processor continually monitors stand-by system for leaks.
- **Enclosure Rating**
NEMA 4X, can be located outdoors and is lockable.
- **Intrinsically Safe**
meets intrinsically safe requirements.
- **Communication Contacts**
standard wet/dry contacts for remote alarms, or PC interface modems for phone dialer or web based telemetry available.
- **One Bank Priority**
flip a switch to prioritize the left or right gas supply.
- **Easily Changed Switchover Point**
select the desired pressure point and push a button.

High-Purity

CHANGEOVER PANELS



Inert and Oxygen Service

Specifications	Brass Models	Stainless Steel Models
Maximum Inlet Pressure	3,000 psig	3,000 psig
Maximum Delivery Pressure	10-200 psig (adjustable)	10-200 psig (adjustable)
Inlet/Outlet	1/2" FNPT	1/2" FNPT
Temperature Range	0 to 140° F	0 to 140° F

Materials	Brass Models	Stainless Steel Models
Body	Brass Barstock	316L Stainless Steel
Bonnet	Die Cast (Painted)	Chrome Plated Brass Barstock
Diaphragm	302 Stainless Steel	316L Stainless Steel
Inlet/Outlet Gauge	Transducer to LCD Panel	Transducer to LCD Panel
Nozzle	Brass	316L Stainless Steel
Seat	PTFE	PTFE
Seals	PTFE	PTFE
Seat Return Spring	Stainless Steel	316L Stainless Steel
Filter (10) Micron	Nickel-Plated Sintered Bronze	Sintered Stainless Steel
Helium Leak Rate	1 x 10 ⁻⁸ cc/sec inboard	1 x 10 ⁻⁹ cc/sec inboard
Relief Valve	Brass	Stainless Steel

CROSSOVER PANELS

High-Purity

Fully Automatic System Cont.

Ordering Information

Product Number	Material	No. of Cylinders	Delivery Pressure	Capacity (scfh Air @ Max Del. Pressure)
Y11-X71H02 (CGA)	Brass	2	10-200 psig	1,000
Y11-X71H04 (CGA)	Brass	4	10-200 psig	1,000
Y11-X71H06 (CGA)	Brass	6	10-200 psig	1,000
Y11-X71H08 (CGA)	Brass	8	10-200 psig	1,000
Y11-X71H10 (CGA)	Brass	10	10-200 psig	1,000
Y11-X74H02 (CGA)	Stainless Steel	2	10-200 psig	1,000
Y11-X74H04 (CGA)	Stainless Steel	4	10-200 psig	1,000
Y11-X74H06 (CGA)	Stainless Steel	6	10-200 psig	1,000
Y11-X74H08 (CGA)	Stainless Steel	8	10-200 psig	1,000
Y11-X74H10 (CGA)	Stainless Steel	10	10-200 psig	1,000

Available Options

Product Number	Description
Y78-RW12VK	Remote Alarm, 12V with two system status LED's & audible buzzer
Y78-ADS200	Switchover Alert Phone Dialer

Additional Information:

Web page monitoring, calls phone/pager/emails alert messages (Hardware)
Available upon special request only - call 800-939-5711, ext. 18

Acetylene Service

Specifications

	Brass Models
Maximum Inlet Pressure	500 psig
Maximum Delivery Pressure	2-15 psig (adjustable)
Inlet/Outlet	1/2" FNPT
Temperature Range	0 to 140° F

Materials

Body	Brass Barstock
Bonnet	Die Cast (Painted)
Diaphragm	302 Stainless Steel
Nozzle	Brass
Seat	PTFE
Seals	PTFE
Seat Return Spring	Stainless Steel
Filter (10) Micron	Nickel-Plated Sintered Bronze
Helium Leak Rate	1 x 10 ⁻⁸ cc/sec inboard
Inlet/Outlet Gauge	Transducer to LCD Panel

Ordering Information

Product Number	Material	No. of Cylinders	Delivery Pressure	Capacity (scfh Air @ Max Del. Pressure)
Y11-X81C02 (CGA)	Brass	2	2-15 psig	Flow rate dependant on cylinders
Y11-X81C04 (CGA)	Brass	4	2-15 psig	Flow rate dependant on cylinders

Available Options

Product Number	Description
Y78-RW12VK	Remote Alarm, 12V with two system status LED's & audible buzzer
Y78-ADS200	Switchover Alert Phone Dialer

Additional Information:

Web page monitoring, calls phone/pager/emails alert messages (Hardware)
Available upon special request only - call 800-939-5711, ext. 18
Web page monitoring, calls phone/pager/emails alert messages (Wireless)
Available upon special request only - call 800-939-5711, ext. 18

Fully Automatic System Cont.

High-Purity

CHANGEOVER PANELS

Flammable Service

Specifications	Brass Models	Stainless Steel Models
Maximum Inlet Pressure	3,000 psig	3,000 psig
Maximum Delivery Pressure	10-200 psig (adjustable)	10-200 psig (adjustable)
Inlet/Outlet	1/2" FNPT	1/2" FNPT
Temperature Range	0 to 140° F	0 to 140° F

Materials	Brass Models	Stainless Steel Models
Body	Brass Barstock	316L Stainless Steel
Bonnet	Die Cast (Painted)	Chrome Plated Brass Barstock
Diaphragm	302 Stainless Steel	316L Stainless Steel
Nozzle	Brass	316L Stainless Steel
Seat	PTFE	PTFE
Seals	PTFE	PTFE
Seat Return Spring	Stainless Steel	316L Stainless Steel
Filter (10) Micron	Nickel-Plated Sintered Bronze	Sintered Stainless Steel
Helium Leak Rate	1 x 10 ⁻⁸ cc/sec inboard	1 x 10 ⁻⁹ cc/sec inboard
Inlet/Outlet Gauge	Transducer to LCD Panel	Transducer to LCD panel
Relief Valve	Brass Pipe Away External Venting, Fuel	Stainless Steel Pipe away External Venting, Fuel

Ordering Information				
Product Number	Material	No. of Cylinders	Max Outlet Press. (psig)	Capacity (scfh Air @ Max Del. Press)
Y11-X81H02 (CGA)	Brass	2	10-200	1,000
Y11-X81H04 (CGA)	Brass	4	10-200	1,000
Y11-X81H06 (CGA)	Brass	6	10-200	1,000
Y11-X81H08 (CGA)	Brass	8	10-200	1,000
Y11-X81H10 (CGA)	Brass	10	10-200	1,000
Y11-X84H02 (CGA)	Stainless Steel	2	10-200	1,000
Y11-X84H04 (CGA)	Stainless Steel	4	10-200	1,000
Y11-X84H06 (CGA)	Stainless Steel	6	10-200	1,000
Y11-X84H08 (CGA)	Stainless Steel	8	10-200	1,000
Y11-X84H10 (CGA)	Stainless Steel	10	10-200	1,000

Available Options		Additional Information:
Product Number	Description	Web page monitoring, calls phone/pager/emails alert messages (Hardware) Available upon special request only - call 800-939-5711, option 2
Y78-RW12VK	Remote Alarm, 12V with two system status LED's & audible buzzer	

Changeover Manifolds- *Fully Automatic PLC Based*

Changeover Manifolds - Fully Automatic PLC Based

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



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SMART LOGIC

Description: This advanced electronically operated **SMART LOGIC** changeover manifold is truly fully automatic. It provides the user with simple, intuitive operation using a color touch screen – no buttons to push and no knobs to turn. The **SMART LOGIC** allows users to switch from high-pressure cylinders on both sides to low-pressure cryogenic containers on one side and high-pressure cylinders on the other side, or cryogenic containers on both sides with just a few screen touches. Once you have set the operating parameters, you need only change cylinders as necessary. The system takes care of everything else. There is no need to make pressure adjustments or flip a knob after the system has switched from one side to the other. Just replace the empty cylinders and open the valves. The system is now set to change in the opposite direction. These systems are truly automatic and hassle free.

The **SMART LOGIC** capabilities provide customers with the best changeover system to suit their current operation and future expanded requirements without needing to buy another system.

The **SMART LOGIC** is available constructed with brass or stainless steel high-purity gas components. It has digital pressure readouts for inlet pressures and outlet delivery pressure, built-in alarms, and dry contacts to operate external equipment, such as remote alarms or an auto-dialer. Entire system is housed in a NEMA 4X box.

Note: This unit is not for flammable gas service.

Specifications	
Max inlet pressure	3000 psig
Power required	120 VAC/60Hz

PPLC Fully Automatic

CHANGEOVER PANELS



Design Features

- Fully automatic, simple, hassle-free operation via a color touch screen
- Constant digital and graphic gas supplies on both sides
- Delivery pressure monitor displays any unusual variances
- High and low adjustable delivery pressure alarm settings
- Designed for high-purity gas service
- May be used with any type gas source
- "Leak-Check" monitoring alerts the user to low reserve side pressure of either high-pressure or cryogenic containers while in standby via audible and visual alarms
- "Gas-Check" feature assures efficient use of gas supplies when cryogenic containers are in service
- Built-in audio and visual alarm
- External dry contacts provided to activate optional equipment or remote alarms
- System housed in a NEMA 4X box
- Available in either brass or stainless steel construction

Ordering Information

Model	Description	Delivery Pressure	No. Cyls.
Y11-SL120(CGA)	brass electronic high purity changeover manifold, 2 cylinder (1x1)	25-200 psig	2
Y11-SL140(CGA)	brass electronic high purity changeover manifold, 4 cylinder (2x2)	25-200 psig	4
Y11-SL420(CGA)	SS electronic high purity changeover manifold, 2 cylinder (1x1)	25-200 psig	2
Y11-SL440(CGA)	SS electronic high purity changeover manifold, 4 cylinder (2x2)	25-200 psig	4

SMART LOGIC *PLUS*

PPLC Fully Automatic

CHANGEOVER PANELS

Description: The **SMART LOGIC *PLUS*** changeover manifold is an advanced version of the **SMART LOGIC**. It provides the user with simple, intuitive operation using a color touch screen – no buttons to push and no knobs to turn. Like the **SMART LOGIC**, users can switch from high-pressure cylinders on both sides to low-pressure cryogenic containers on one side and high-pressure cylinders on the other side, or cryogenic containers on both sides with just a few screen touches. Once you have set the operating parameters, you need only change cylinders as necessary. The system takes care of everything else. There is no need to make pressure adjustments or flip a knob after the system has switched from one side to the other. Just replace the empty cylinders and open the valves. The system is now set to change in the opposite direction. These systems are truly automatic and hassle free.

The **additional SMART LOGIC *PLUS*** capabilities provide customers with a larger display and integration into the user's computer network. It enables remote monitoring of gas supply, gas usage, when the gas supply switches to reserve, and alarms when gas levels are low, or when a leak in the reserve supply is detected – all on a local network.

The Smart Logic is available constructed with brass or stainless steel high purity gas components. It has digital pressure readouts for inlet pressures and outlet delivery pressure, built-in alarms, and dry contacts to operate external equipment, such as remote alarms or an auto-dialer. Entire system is housed in a NEMA 4X box.

Note: This unit is not for flammable gas service.



Design Features

- Fully automatic, simple, hassle-free operation via a large color touch screen
- **Can be controlled via network**
- **Provides full data logging capability for all functions**
- Operating parameters are password protected for multiple operators.
- Provides automatic purging to ensure gas purity on cylinder change outs
- Constant digital and graphic gas supplies on both sides
- Delivery pressure monitor displays any unusual variances
- High and low adjustable delivery pressure alarm settings
- Designed for high-purity gas service
- May be used with any type gas source
- "Leak-Check" monitoring alerts the user to low reserve side pressure of either high-pressure or cryogenic containers while in standby via audible and visual alarms
- "Gas-Check" feature assures efficient use of gas supplies when cryogenic containers are in service
- Built-in audio and visual alarm
- External dry contacts provided to activate optional equipment or remote alarms
- System housed in a NEMA 4X box
- Available in either brass or stainless steel construction

Specifications	
Max inlet pressure	3000 psig
Power required	120 VAC/60Hz

Ordering Information

Model	Description	Delivery Pressure	No. Cyls.
Y11-SLP120(CGA)	brass electronic high purity changeover manifold	25-200 psig	2
Y11-SLP420(CGA)	SS electronic high purity changeover manifold	25-200 psig	2

Life Science Switchover Regulator Series

Description: The Airgas® Life Science Series System is a automatic switchover system designed to supply a continuous supply of high purity, non-corrosive gas. This series is designed for the life science market and the gases used in this market, it does extremely well in CO₂ service. Due to the pressure differential considerations, an integral line regulator is used to maintain constant downstream pressure. The pigtails are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves.

The 6 and 8 cylinder models use our block manifold header as standard.

Note: There are no shut off or purge valves in this system. They may be added as an option, or refer to our High Purity Changeover Panels.



Design Features

Metal-to-metal diaphragm seal

No possibility of gas contamination

User-friendly priority valve

One knob switches cylinder priority

Check valves in CGA nipples

Prevents contamination and back flow

Line regulator

Assures stable line pressure during changeover

Materials

Body	Brass barstock, 316 Stainless Steel
Seat	PTFE
Diaphragm	316L Stainless Steel
Gauges	Brass, 316L Stainless Steel
Filter	10 micron Sintered Bronze or 316L Stainless Steel Mesh
Seals	PTFE (PCTFE for 4500 psig option)

Specifications

Maximum Rated Inlet Pressure	3000 PSIG (4500 PSIG Optional)
Maximum Outlet Pressure	0-50, 0-150, 0-250 PSIG
Flow Capacity	Cv=0.1
Ambient Operating Temperature	-40°F to 140°F (-38°C to 60°C)
Designed Leak Rate	1 x 10 ⁻⁸ scc/sec
Weight	9 lbs.
Ports	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Gauge	2" diameter

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Pressure (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP602B(CGA)	2	Brass	3000	10-50	450	0-4000
Y11-CP604B(CGA)	4	Brass	3000	10-50	450	0-4000
Y11-CP606B(CGA)	6	Brass	3000	10-50	450	0-4000
Y11-CP608B(CGA)	8	Brass	3000	10-50	450	0-4000
Y11-CP642B(CGA)	2	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP644B(CGA)	4	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP646B(CGA)	6	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP648B(CGA)	8	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP602D(CGA)	2	Brass	3000	10-150	875	0-4000
Y11-CP604D(CGA)	4	Brass	3000	10-150	875	0-4000
Y11-CP606D(CGA)	6	Brass	3000	10-150	875	0-4000

CHANGEOVER MANIFOLDS

Life Science

Life Science Switchover Regulator Series Cont.

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP608D(CGA)	8	Brass	3000	10-150	875	0-4000
Y11-CP642D(CGA)	2	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP644D(CGA)	4	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP646D(CGA)	6	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP648D(CGA)	8	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP602E(CGA)	2	Brass	3000	10-250	1,100	0-4000
Y11-CP604E(CGA)	4	Brass	3000	10-250	1,100	0-4000
Y11-CP606E(CGA)	6	Brass	3000	10-250	1,100	0-4000
Y11-CP608E(CGA)	8	Brass	3000	10-250	1,100	0-4000
Y11-CP642E(CGA)	2	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP644E(CGA)	4	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP646E(CGA)	6	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP648E(CGA)	8	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP602G(CGA)	2	Brass	3000	10-400		0-4000

Available Options

Product Number	Description
Y99-4CYLRACK	4 Cylinder Rack
Y78-820ALPK*	Non-Flammable Alarm Package

Remote Alarm Capability: Must be ordered at time of original order

Flammable Gas Service Provided with Intrinsic Safety Barriers to ensure safe operation

*Integrated Alarm Systems (pressure switch gauges) available, call 1-800-939-5711.

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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IntelliSwitch® Cryogenic or High Pressure Switchover System Microprocessor Controlled

Description: The Airgas® 539 Series IntelliSwitch® Fully Automatic Switchover System provides a continuous supply of high purity, non-corrosive gas, non-flammable gas from either cryogenic liquid or high pressure cylinder sources. Microprocessor control lowers the yearly gas cost by eliminating liquid cylinder vent loss and excess residual return when using cryogenic liquid cylinders as a gas source. Electronic source controls allow change from high pressure to any pressure liquid cylinders at the push of a button. Low loss and electronic economizer functions ensure trouble free use and real gas consumption savings with fully automatic switchover controls. NEMA 12 enclosure standard, NEMA 4 optional enclosures provide LED displays of inlet and outlet pressures as well as complete system functions. Field adjustable switchover pressure and keypad lockout are some of the many unique functions standard with this system. The pigtails are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves.

This unit is specifically designed for high flow applications and is ideal for laser service as well.

539 Series

SWITCHOVER REGULATORS



Design Features

Microprocessor Control

Fully automatic priority system

316L stainless steel diaphragm

No possibility of gas contamination

Field Adjustable parameters

Enable process and source flexibility

Onsite source selection

Liquid or high pressure cylinders at the push of a button

RS 232 or RS 485 communication

Low loss technology

Reduces residual return and vent loss from liquid cylinders

Check valves in CGA nipples

Prevents contamination and back flow

Balanced Stem regulator

Assures stable line pressure regardless of inlet pressure

Specifications	
Maximum Rated Inlet Pressure	3000 PSIG
Maximum Outlet Pressure	0-100, 0-150, 0-200 PSIG
Flow Capacity	Cv = 1.0
Ambient Operating Temperature	0°F to 140°F (-17°C to 60°C)
Designed Leak Rate	1 x 10 ⁻⁸ scc/sec
Weight	67 lbs.
Power requirements	110 or 220 VAC versions
Inlet	1/2" FNPT
Outlet	1/2" FNPT
Gauge	digital
Weight	67 lbs.

Materials	
Body	Brass barstock
Valve Stems	316L Stainless Steel
Valve Seat	PCTFE Kel-F®
Diaphragm	316L Stainless Steel
Gauges	Brass, 316L Stainless Steel
Filter	40 micron 316L Stainless Steel Mesh
Seals	PTFE PCTFE-Kel-F Viton

SWITCHOVER REGULATORS

539 Series

IntelliSwitch® Cryogenic or High Pressure Switchover System Microprocessor Controlled Cont.

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Display Range (psig)
Y11-MSP120C	2	Brass	3000	10-100	2000	0-5000
Y11-MSP140C	4	Brass	3000	10-100	2000	0-5000
Y11-MSP160C	6	Brass	3000	10-100	2000	0-5000
Y11-MSP180C	8	Brass	3000	10-100	2000	0-5000
Y11-MSP120D	2	Brass	3000	10-150	2000	0-5000
Y11-MSP140D	4	Brass	3000	10-150	2000	0-5000
Y11-MSP160D	6	Brass	3000	10-150	2000	0-5000
Y11-MSP180D	8	Brass	3000	10-150	2000	0-5000
Y11-MSP120E	2	Brass	3000	10-200	2000	0-5000
Y11-MSP140E	4	Brass	3000	10-200	2000	0-5000
Y11-MSP160E	6	Brass	3000	10-200	2000	0-5000
Y11-MSP180E	8	Brass	3000	10-200	2000	0-5000

Other configurations available upon request.

Available Options

Product Number	Description
Y15-4P72K2C	6 foot pigtail upgrade option, 2 cylinders
Y15-4P72K4C	6 foot pigtail upgrade option, 4 cylinders
Y15-4P72K6C	6 foot pigtail upgrade option, 6 cylinders
Y99-4CYLRACK	4 Cylinder Rack
Y78-5752ALPK	Advantium 2 Remote Alarm

Automatic Liquid Cylinder Gas Phase Changeover Manifold

Description: The Airgas series 240 Manifold is designed specifically to regulate and monitor vaporized gas from cryogenic cylinders. The Series 240 Manifold prevents downtime by automatically switching over when the primary cylinder bank is depleted.

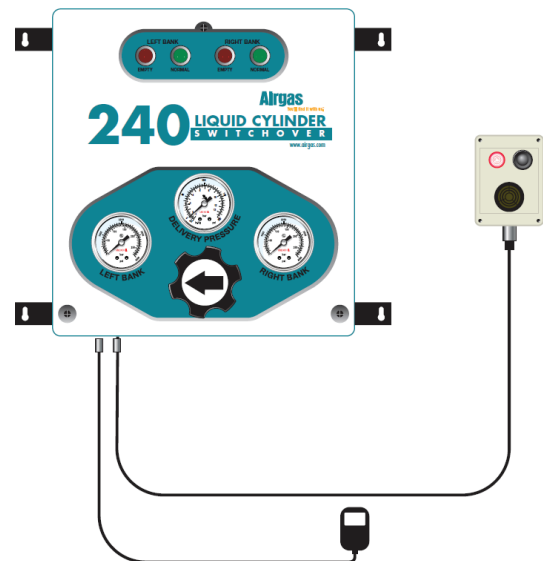
A green light indicates the primary cylinder service bank is functioning and the reserve cylinder bank is ready for service. A red light signals that the system has changed over and one or both banks are depleted. The user resets the primary bank by turning the knob.

Design Features

- Integral alarm system is standard, remote A/V alarm optional
- Electrical - 115 volts (AC)
- Maximum inlet pressure 350 PSIG
- Manifold outlet - 1/2" NPT
- Relief valve outlet - 1/4" NPT
- 240 Series for use with 235 PSIG relief valve liquid cylinders
- 240HP Series for use with 350 PSIG relief valve liquid cylinders
- 72" Pigtails are standard

Liquid Cylinder Gas Phase

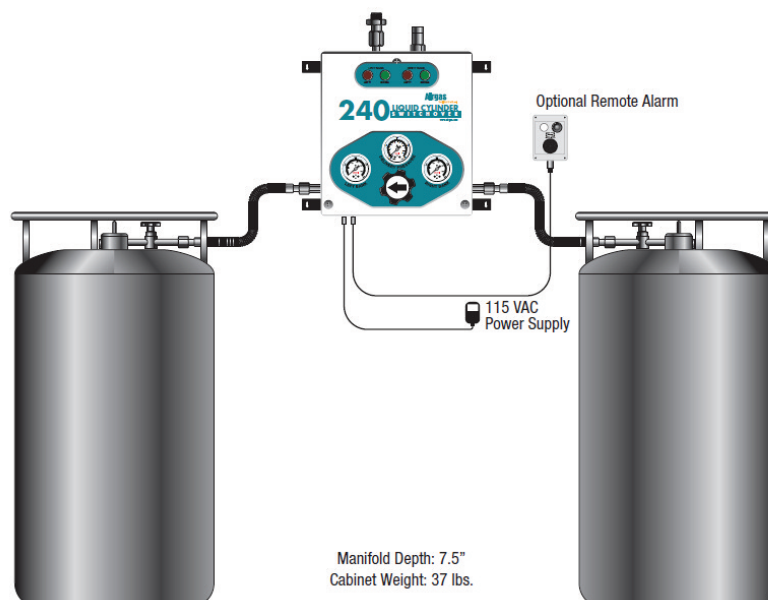
CHANGEOVER MANIFOLDS



Optional Remote Alarm Panel shown

Specifications/Ordering Information

Model	Maximum Inlet Pressure	Maximum Flow Rate	Internal Adjustable Line Regulator Delivery Range
Y11-CP240LP(CGA)	225 PSIG	750 SCFH	40 – 85 PSIG
Y11-CP240HP(CGA)	350 PSIG	800 SCFH	40 – 180 PSIG
Y78-LC240ALPK	Remote alarm package		



Manifold Depth: 7.5"
Cabinet Weight: 37 lbs.

Engineering the Right Solutions



Airgas CryoWiz

The Airgas 577 series CryoWiz™ delivers a continuous supply of liquid nitrogen from a primary and secondary source automatically with no temperature change. The CryoWiz uses a proprietary algorithm and precise pressure and temperature sensors to monitor the demand for and supply of the liquid nitrogen. With a unique insulated switching mechanism, high flow pneumatic valves, and hot gas bypass programming, the CryoWiz automatically switches sources with virtually no change in delivered cryogenic temperature. Ensuring both consistent temperature and continuous supply, the CryoWiz is ideal for critical cryogenic applications such as cryopreservation and environmental chambers

Cryogenic Liquid Manifold

Manifolds



Design Features

- **Automatic Proprietary Control Algorithm**
Ensures continuous efficient supply
- **Insulated Switching Mechanism**
Minimizes flow loss of liquid
- **High Flow Pneumatic Control Valves**
Supplies multiple freezers
- **Hot Gas Bypass**
Eliminates flow loss
- **Single Compact NEMA 12 Enclosure**
Occupies less space easy to install
- **Remote Monitoring**
USB and Ethernet communication
24,000 event date and time log
- **Oxygen Deficiency Relay Contact**
Ensures OSHA safe use
- **Local Audible and Visual Alarm**
On-board emergency monitoring
- **Optional Remote Alarm**

Materials

Enclosure	Powder coated NEMA 12
Internals	Brass bar stock
Cryogenic Relief Valves	50 PSIG (3.5 BAR) optional 1/2" FPT
Hot Gas Bypass	1/2" FPT
Maximum Inlet Pressure	35 PSIG (2.4 BAR) optional
Inlet Connection	1/2" FPT
Outlet Connection	1/2" FPT
Drain	1/2" PVC

Specifications

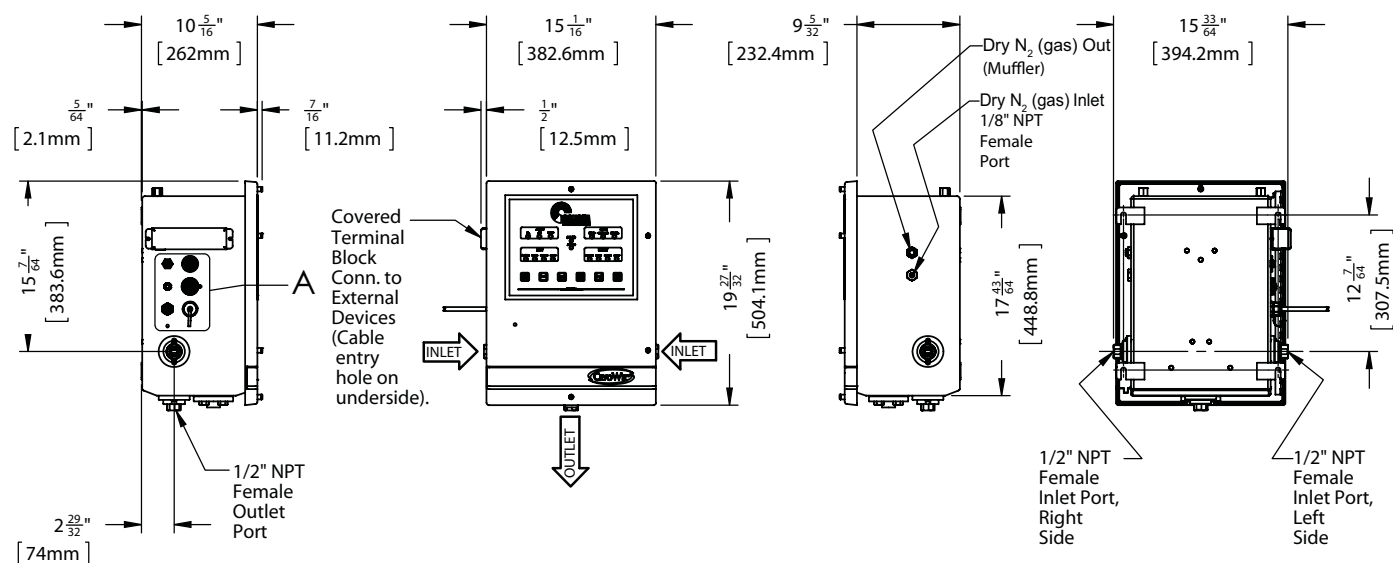
Alarm Output	1 or 5 dry contact NC
Alarm Inputs	Oxygen deficiency relay
Dry Nitrogen (Gaseous)*	105 PSIG (7 BAR) max 95 PSIG (5 BAR) min Inlet: 1/8" FNPT * Required for pneumatics
Communication Ports	USB (maintenance only) Ethernet (optional)
Power	90-264 VAC, 47-63 Hz (US, UK, European, Australian, and Chinese adapters included)
Weight	40 lbs (18 kg)

Airgas Quality Policy

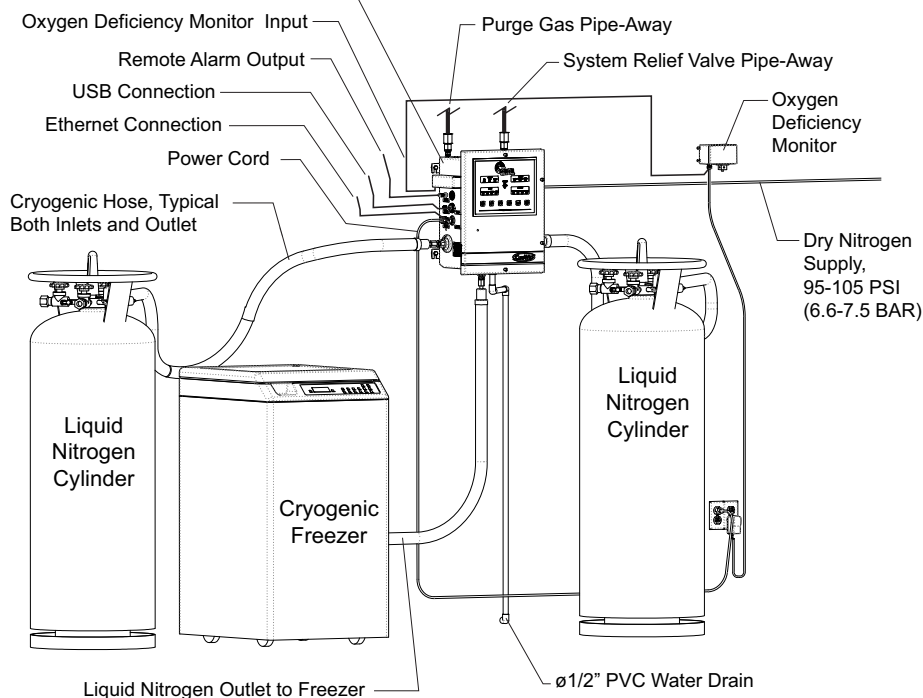
The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Specialty Gas Equipment

Airgas
an Air Liquide company



577 Series CryoWiz™



Ordering Information

Product Number	Description	Material
Y11-CP577N2	1 x 1 Liquid Nitrogen Manifold No Hose	Brass
Y11-CP577N236	1 x 1 Liquid Nitrogen Manifold w/36" Hose	Brass
Y11-CP577N248	1 x 1 Liquid Nitrogen Manifold w/48" Hose	Brass
Y11-CP577N272	1 x 1 Liquid Nitrogen Manifold w/72" Hose	Brass
Y40-DEFALARM	Oxygen Deficiency Alarm 110 VAC No Hose	

For additional hoses, configurations, options and technical support please call 1-800-939-5711

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Vacuum Jacketed Cryogenic Liquid Nitrogen Manifold for Cryogenic Freezers

Description: Airgas' stainless steel vacuum jacketed tank switcher provides a continuous liquid nitrogen supply by automatically switching to another dewar when the primary tank supplying the freezer becomes empty. This unit is specifically designed to provide cryogenic liquid nitrogen to freezers. The unit is constructed of vacuum jacketed piping and the valves are specifically designed to operate and control cryogenic liquids without large ice build ups on the system.

Liquid flows to the freezer or other device are ensured by a capacitive probe that detects actual liquid in the line, unlike some models that only sense liquid or gas temperatures.

The vacuum jacketed lines prevent dripping and sweating. Combined with an included Programmable Logic Controller (PLC) this tank switcher provides improved accuracy and cryogen control.

Vacuum Jacketed Cryogenic Changeover

CHANGEOVER PANELS



Two-Tank Version Specifications	
Manifold Dimensions	28" W x 28" H 24" D (71 cm x 71 cm x 61 cm)
Control Box Dimensions	11.5" W x 13.5" H x 6" D (29.2 cm x 34.3 cm x 15 cm)
Operating Temperature	32°F-120°F (0°C-50°C)
Enclosure and Penetrations Rating	NEMA 4X, IP65
Power Requirements	110-240 VAC, 50-60 Hz
Power Usage	200 watts @ 110 VAC 1.7 amp max.
Alarm Output	24 VDC 0.2 amp max. current

Materials	
Tubing	Stainless Steel
Relief Valves	Brass
All other wetted parts	Stainless Steel

Other versions and configurations available

Design Features

- No operator intervention for cylinder switching.
- Frost-free operation. No more puddles or water running down the walls.
- Quicker cool-down time enabling faster delivery of liquid nitrogen to cryogenic freezers or other applications.
- Easy to operate touch screen controls with simple operation and adjustments.
- Eliminates system downtime during cylinder switchout.
- Allows different pressure liquid nitrogen cylinders and VGLs.

Ordering Information

Product Number	Description
Y11-TECFAB1	Stainless steel liquid changeover 2 cylinders 1 x 1

Other versions and configurations available

Optional Parts

Product Number	Description
Y15-35308	Vacuum jacket inlet hoses ½" ID hoses 295 CGA x T-65 bayonet
Y91-23208	T-65 Bayonet clamps

Other lengths available

Engineering the Right Solutions



High-Pressure Automatic Switchover System

Description: These high pressure changeover manifolds are designed for high delivery pressures and to supply a continuous supply high pressure, high purity, non-corrosive, non-oxidizing gas, from either a 3000, 4500, or 6000 psig pressure source. Due to the pressure differential considerations, an integral line regulator is used to maintain constant downstream pressure that is available in four delivery pressure ranges. The pigtailed are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves and the system includes high pressure inlet isolation valves and intermediate check valves to ensure optimum safe operation even at high pressures. The system is ideal for high pressure testing or process applications.

The system is available in either 2- or 4-cylinder models.

**There are high pressure inlet shut off valves in this system.

***An optional remote alarm model is available that allows for notification of the system switching.

Specifications	
Maximum Rated Inlet Pressure	3000 psig 4500, & 6000 psig
Maximum Outlet Pressure	0-1000, 0-1500, 0-2500, 0-3500 psig
Flow Capacity	Cv = 0.1
Ambient Operating Temperature	-40°F to 140°F (-38°C to 60°C)
Designed Leak Rate	1 x 10 ⁻⁶
Weight	22.5 lbs.
Ports	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Gauge	2 1/2" diameter

530 Series

SWITCHOVER SYSTEMS



*Pictured without pigtailed. System does include a 30" pigtail with check valve CGA connection for each cylinder.

Design Features

- Piston sensed cartridge design**
Accurate stable pressure control at high pressure
- User-friendly priority valve**
One knob switches cylinder priority
- Check valves in CGA nipples**
Prevents contamination and back flow
- Line regulator**
Assures stable line pressure during changeover

Materials

Body	Chrome-plated Brass barstock
Seat	PEEK Arlon® (switching regulators) PCTFE (line regulator)
Piston Cartridge	Brass Barstock
Gauges	Chrome-plated Brass, 316L Stainless Steel alarm models
Filter	10micron Sintered Bronze
Seals	Viton® (PCTFE for 4500 psig option)

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP120H(CGA)	2	Chrome-plated Brass	3000	10-1000	4000	0-4000
Y11-CP140H(CGA)	4	Chrome-plated Brass	3000	10-1000	4000	0-4000
Y11-CP120L(CGA)	2	Chrome-plated Brass	4500	10-1500	4000	0-6000
Y11-CP140L(CGA)	4	Chrome-plated Brass	4500	10-1500	4000	0-6000
Y11-CP126L(CGA)	2	Chrome-plated Brass	6000	10-1500	4000	0-10000
Y11-CP146L(CGA)	4	Chrome-plated Brass	6000	10-1500	4000	0-10000
Y11-CP120K(CGA)	2	Chrome-plated Brass	4500	10-2500	4000	0-6000
Y11-CP140K(CGA)	4	Chrome-plated Brass	4500	10-2500	4000	0-6000
Y11-CP126K(CGA)	2	Chrome-plated Brass	6000	10-2500	4000	0-10000
Y11-CP146K(CGA)	4	Chrome-plated Brass	6000	10-2500	4000	0-10000
Y11-CP126M(CGA)	2	Chrome-plated Brass	6000	10-3500	4000	0-10000
Y11-CP146M(CGA)	4	Chrome-plated Brass	6000	10-3500	4000	0-10000

*Other configurations available upon request.

*Call 1-800-939-5711 for pricing.

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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Mounting Racks

Description: These mounting racks are designed to safely secure up to four or six gas cylinders as well as one of our Changeover Panels. One rack can support up to four cylinders, two in front, two in back. The trirack can support six cylinders and three of our changeover panels. Racks feature unobstructed front and rear entry. Shipped in three boxes; some assembly is required. Assembly time is 15–30 minutes with standard tools.

Accessories

CHANGEOVER PANELS



Ordering Information

Product Number	Description	Dimensions	Power Supply
Y99-4CYLRACK	4- Cylinder Floor Rack	27.75" W x 72" H x 20" D	White Powder Coat Epoxy
Y99-6CTRACK	6- Cylinder Tri Rack	14" W x 65.5" H x 18" D	White Powder Coat Epoxy

Engineering the Right Solutions



Airgas Automatic Changeover Two-Channel Remote Alarm

Description: Two-Channel Remote Alarm panel offers two input and two output channels, along with dry contact relay outputs and normally open output capabilities. Other features include a highly visible lighted status notification, a distinctive audible notification, auto-reset when cylinders are replenished, an audible alarm silence feature, the ability to “Daisy Chain” multiple alarm panels together, and Class I, Division II status with a NEMA 4 rating. All of these features are housed in a 4.5" x 3.25" x 2.25" enclosure. This alarm panel package includes a 25-ft. extension cable, with options for a 50-ft. and 100-ft. extension cable, as well.

Design Features

- Two input channels
- Two output channels
- Dry contact relay outputs
- Normally open output capability
- Highly visible lighted status notification
- Distinctive audible notification
- Auto-reset when cylinders are replenished
- Audible Alarm Silence feature
- Ability to “Daisy Chain” multiple alarms
- Class I Division II

Specifications

Audio	95 db audible alarm
Power	120 VAC or 220 VAC 6V AC/DC to 24 V AC/DC
Environment	NEMA 4
Outputs	2 channels Dry Contacts Normally Open/500 mh each Contact Rating .5A 24V
Inputs	2 channels Accepts Normally Open Overcurrent Protected Auto Reset
Connectors (Bulgin)	Input: 6 pin circular Output: 6 pin circular
Dimensions	4.5" x 3.25" x 2.25"

Ordering Information

Product Number	Description
Y78-EN200ALPK	Airgas Two-Channel Alarm Panel – includes 25' extension cable
Y78-820ALPK	Airgas Two-Channel Alarm Panel; includes 25' extension cable, two 0-3000 psig indicating pressure switch gauges, completely installed onto Brass Economy or Life-Science Changeover
Y78-840ALPK	Airgas Two-Channel Alarm Panel; includes 25' extension cable, two 0-3000 psig indicating pressure switch gauges, completely installed onto SS Economy or Life-Science Changeover
Y78-EXTCAB15	50-ft. Extension Cable
Y78-EXTCAB30	100-ft. Extension Cable

Alarms



CHANGEOVER MANIFOLDS



StatusChecker

Description: The Airgas StatusChecker™ provides a cost-effective solution for monitoring a variety of data related to laboratory gas and cryogenic liquid supply. The system provides constant status of your gas supply using your computer network, as well as automatically emailing notifications to up to 10 email addresses that the pressure in your gas supply has dropped below the reorder point. The StatusChecker can also be used to monitor any dry contact, such as a freezer door, and provide notification when the contact is opened or closed, depending on how you configure the setting.

The StatusChecker also gives you an option that allows you to set up a wallpaper status bar on your computer that gives you a visual indication of the eight monitoring points. Status bars display green when not in alarm status and will change to red when the contact goes into alarm.

The unit comes preprogrammed with a self-executing software for easy installation. The user is prompted to input names for the eight contacts, as well as the email addresses, along with a preprogrammed wav file that gives an audio/vocal alarm when one of the contacts goes into alarm. The wav file can be easily replaced by a user-recorded wav file for a specific audio alarm alert.

When the StatusChecker is monitoring your gas supply and the pressure drops below the set pressure on the indicating pressure switch, a wav file is launched and a verbal message is given telling you the supply pressure is at the reorder point. A message also appears on your screen indicating that email notifications have been sent.

The system can be configured to email up to 10 email accounts per monitored contact. Each monitored contact is given a unique name during the easy installation. Recipients of the email notifications can be a purchasing department, the local Airgas replenishment group, the maintenance group that would change out cylinders, or anyone who has a valid account. The system easily connects to a computer/network with an active email account. The account must be open for the system to function properly. If the computer is shut off when the event occurs, it will notify everyone when the computer is back on line.

Gas Monitoring

STATUSCHECKER



The StatusChecker can also be used to monitor any contact switch, such as a cryogenic freezer door. The StatusChecker can notify you whenever the door is opened and provide a log of every time the event occurs.

The StatusChecker comes in multiple configurations and can monitor up to eight contacts with one box. There is also a StatusChecker that monitors two contacts and provides both a visual and audible alarm in addition to the emailing notification capabilities.

Specifications
StatusChecker™/Smart Alarm Combo - Monitoring Capabilities: 2 contacts, 2-contact version has additional local audio and visual alarms. (This unit also requires 120VAC power.)
StatusChecker Monitoring Capabilities: 8 contacts
Power Requirements: USB Powered (The StatusChecker is powered by the USB port.) (The Smart Alarm box requires 120VAC for its function. You will need a separate specification list for the 2-contact unit w/alarm box.)
Connections components are interconnected with standard 20 awg wire.
Environmental Classification: NEMA-4X/IP-65 with optional IP-65 cable glands

Ordering Information	
Product Number	Description
Y78-EMAILER	StatusChecker box only with capabilities to monitor up to (8) points
Y19-125D30PS	Brass Indicating Pressure Switch 0 – 3000 psi ¼" mnpt LM
Y19-125C60PS	Brass Indicating Pressure Switch 0 – 600 psi ¼" mnpt LM
Y19-125C20PS	Brass Indicating Pressure Switch 0 – 200 psi ¼" mnpt LM
Y78-EMLRD30	StatusChecker box, includes (1) 0 – 3000 psi indicating brass pressure switch, w/¼" fnpt connection, and 18" wire leads
Y78-EMLDRC20	StatusChecker box, includes (1) 0-200 psi indicating brass pressure switch w/¼" fnpt connection, and 18" wire leads
Y78-EMLDRC60	StatusChecker box, includes (1) 0-600 psi indicating brass pressure switch w/¼" fnpt connection, and 18" wire leads

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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Wireless Monitoring System

Description: Airgas' wireless monitoring system automates the monitoring and data-logging of gauges that are either not being monitored or are being recorded manually. The Airgas system enables wireless remote monitoring of virtually any analog transducer or instrument with the following outputs: 4-20mA, 0-5V, or 0-10V, RS-232, RS-485, thermocouple, thermistor. Non-disruptive – no need to change out transducers, break pressure seals, or run wires. Compatible with most existing flow meters, current meters, particle counters, thermocouples, weigh scales etc. Enables data logging to enable trend analysis, notification, or statistical process control. Optional Class 1 Div 2 and IP65/NEMA 4 enclosures available. Battery life of three years under typical sampling rates. Optional OPC or BACnet interface to existing building or plant automation system.

This system is very cost effective because it does not require users to replace standard pressure gauges with transducers, which has historically been cost prohibitive due to:

- Cost of disruption to existing operations (shutting down flows, depressurizing).
- Cost installation, wiring, and design.
- Cost of labor for leak checking and other process revalidation.
- Cost of specifying and procuring the appropriate transducers.

The Airgas Wireless Gauge Reader (WGR) system measures rate of change and does not incur costs related to wiring, leak checking, revalidation or other costs related to down time. This is accomplished by using wireless, optical units which simply attach to the front face of an existing gauge (Figure 1).

These units can transmit data wirelessly to an Airgas "Blue Box" (Figure 2) receiver which sends data to operator stations, cell phones and PDA's for alarming, trending and notification. Compared with wired or wireless transducers, the WGR requires significantly lower cost to put into operation (Figure 3).

The benefits of automating gauge and transducer monitoring (Figure 4) include:

- Timely notification of excursions and trends (rate of change) to avoid cost of downtime or lost yield.
- Reduce labor costs associated with manual gauge reading "rounds" and charting.

Wireless System

MONITORING SYSTEM

- Reduce cost of gas by more fully using each cylinder before returning to supplier.
- Enable temporary audits/troubleshooting without need to install new transducers and associated process disruption and revalidation effort.

Based on these benefits, the cost of installing a WGR system can typically be paid back within months.

Technology: The overall architecture of the Wireless Monitoring System is shown in Figure 5. Airgas understands the need to "get the right data, to the right people, at the right time" is what our customers require. In particular, we strive to accomplish this with the minimum of disturbance or changes required to any existing IT infrastructure or processes already in use.

As a result, the Wireless Monitoring System is designed for flexibility and ease of interfacing with a variety of existing plant control systems, IT systems and protocols. Our architecture conforms to typical plant Supervisory Control and Data Acquisition (SCADA) layered architectures which include a Field Devices Layer, Data Acquisition and Control Layer, Plant Information Layer, and Human Machine Interface Layer.

We use industry open standards and protocols such as OPC (used by process industries and manufacturing), SECS/GEM (used by Semiconductor Fabs), BACnet (used in Building Automation) and also Microsoft ODBC and ADO.NET for database connectivity. We also accommodate analog signals as 0-5V, 0-10V and 4-20mA current loop for interfacing with legacy PLC's and automation controllers.

For CML, we propose the "Standalone WGR" option shown on the right side of Figure 5.



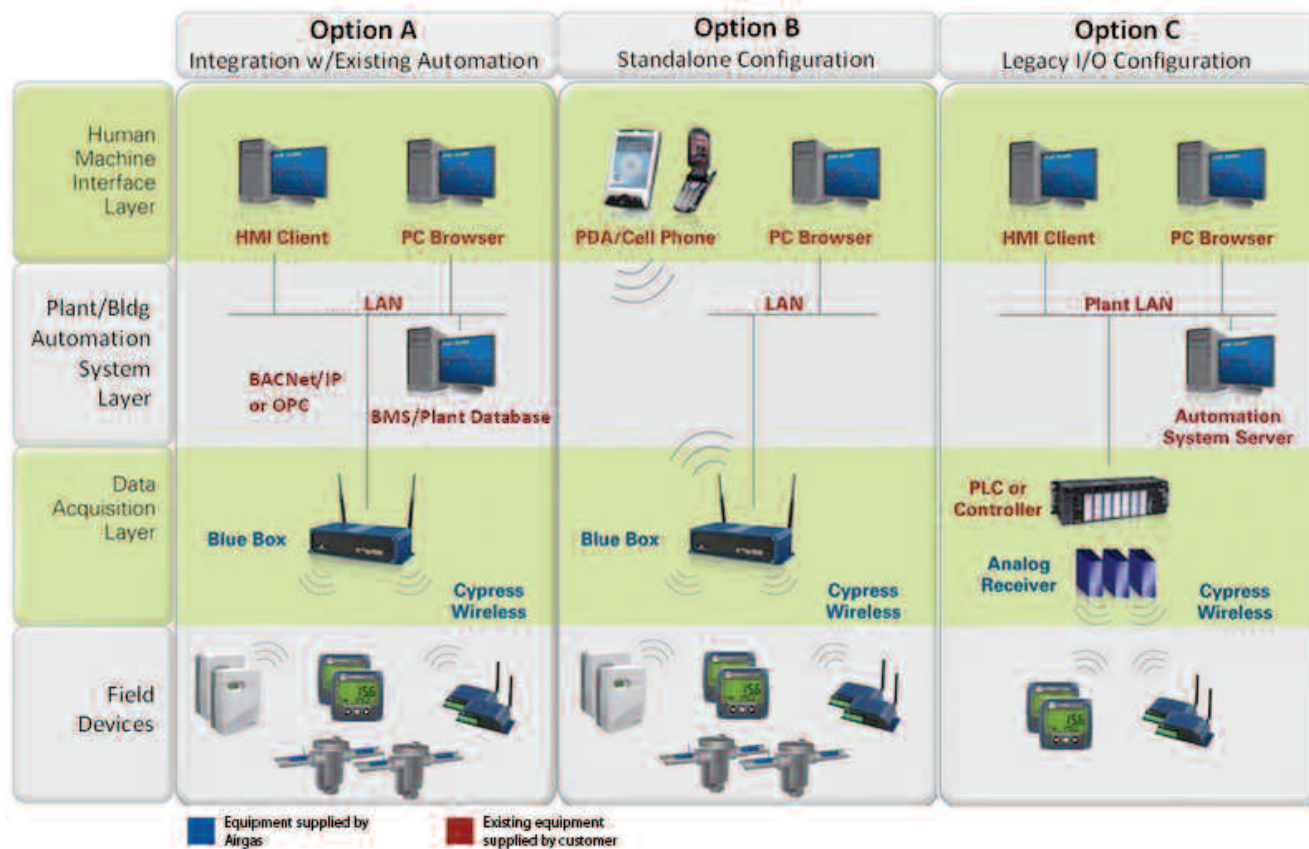
MONITORING SYSTEM

Wireless System

Wireless Monitoring System Cont.

This schematic provides details on the architecture for the Airgas Wireless Monitoring System. Near-future development includes wireless devices that can read

seven-segment LED displays, linear gauges, float flow indicators, remote alarm lights, etc.



Wireless Gauge Reader

Description: Non-invasively read legacy manual gauges and transmit the data to a PC, data acquisition or automation system

- Monitor critical process or facility parameters and display on operator console
- Enable notification when readings exceed limits
- Gather data to enable trend analysis, or to apply statistical process control
- Connect gauge data to control system to trigger actuation of motors, valves and pumps

The Airgas Wireless Gauge Reader (WGR) is more cost effective and requires less time to install than a new transducer. It does not require the removal of old gauges, breaking of pressure seals, learning new software, or interruption of the underlying process. Just clamp it on to an existing gauge and in minutes, wirelessly acquire readings on an existing data acquisition or control system.

Wireless Monitoring

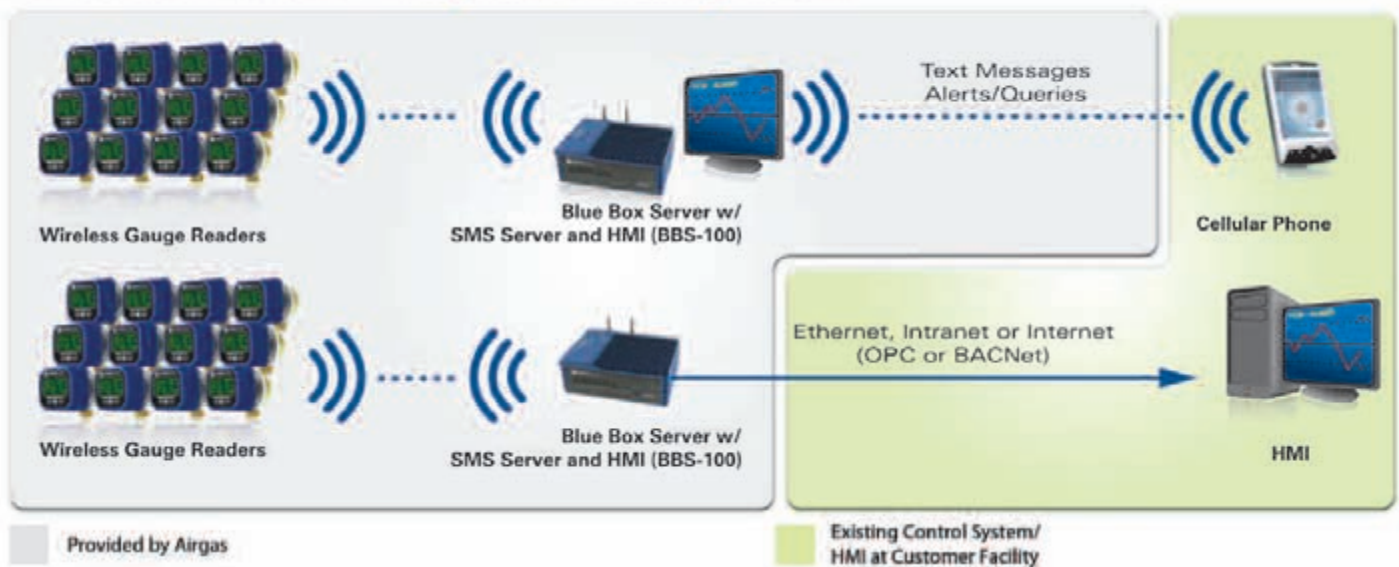
MONITORING SYSTEMS



Design Features

- Non-invasive, easy clamp on fit—no need to break seals
- 1.5" to 4.6" diameter gauges from most manufacturers
- Uses robust and highly optimized industrial DSSS radio and protocol with antenna and frequency diversity
- Battery life up to 3 years
- Low battery indicator
- NEMA4/IP66 enclosure for indoor/outdoor use
- Accuracy $\pm 1.5\%$ of full scale, comparable to typical person reading gauge
- One-time calibration and setup
- No new software to install—data can be viewed using standard web browser
- FCC, RoHS and ETSI compliant
- Optional connectivity to existing building or plant automation systems via OPC or BACnet

Two Possible Wireless Gauge Reader Configurations



MONITORING SYSTEMS

Wireless Monitoring

Wireless Gauge Reader Cont.

WIRELESS GAUGE READER (WGR-100)

Specifications	
Gauge Compatibility:	Most gauges from 1.5" to 4.64" (38mm to 114mm) diameter
Gauge Mounting:	Adapters with removable clamps
Data Capture Rate:	User-configurable: 1 sample per 5 seconds to 1 sample per 18 hours
Accuracy:	± 1.5% of full scale gauge reader (e.g. ± 1.5 psi for 0 to 100 psi pressure gauge)
Wireless Frequency:	2.4GHz Direct Sequence Spread Spectrum, 50mW peak output
Wireless Range:	Up to 1150 ft (350m), high interference immunity, extendable with repeaters
Wireless Protocol:*	Airgas Semiconductor's highly optimized industrial DSSS radio and protocol. Integrates robust security, antenna and frequency diversity, optional encryption and minimal interference with existing wireless systems.
Approvals:	FCC Class B compliant, RoHS, ETSI compliant
Power Supply:	Two 3V lithium batteries
Battery Life:	>1 year @ 1 sample per 5 min, >3 years at 1 sample/hour (approximate)
Vibration:	Up to 4G rms
Humidity:	10-99%RH, non-condensing
Operating Temperature:	-4°F to 158°F (-20°C to 70°C)
Storage Temperature:	-40°F to 176°F (-40°C to 80°C)
Enclosure:	IEC IP66 compliant (outdoor, water resistant)
Housing Material:	ABS with UV inhibitors
Display:	LCD display (for manual reading)
Dimensions:	2.6" x 2.6" x 1.3" (65mm x 65mm x 33mm)
Weight:	0.33lbs (150g) including batteries

*All wireless devices use Airgas Semiconductor's industry-leading frequency agile protocols providing unmatched interference immunity and co-location capabilities.

OUR FAMILY OF PRODUCTS:

					
WIRELESS PNEUMATIC THERMOSTAT (WPT)	WIRELESS GAUGE READER (WGR-100)	WIRELESS STEAM TRAP MONITOR (WSTM-100)	WIRELESS FREEZER MONITOR (WFM-100)	WIRELESS TRANSDUCER READER (WTR-100)	BLUE BOX SERVER (BBS-100)

Wireless Transducer Reader

Wireless Monitoring

MONITORING SYSTEMS

Description: Non-invasively connects to your existing standalone transducers via wireless to your existing PC, data acquisition or automation system so you can capture and store readings.

- Keep your existing reliable transducers (pressure, temperature, particle counter, etc.)
- Eliminate “rounds” to collect readings
- Trend, monitor and alarm transducer readings to catch problems before they occur

The Airgas Wireless Transducer Reader (WTR) provides an inexpensive solution to connect your existing standalone transducers to your current monitoring and control systems.

Installation and setup are easy. Simply connect any standard analog output (0-5V, 0-10V, 4-20mA) from your existing transducer to the WTR. Once the WTR is connected, it will transmit the readings wirelessly at a user-configurable update rate.



Design Features

- Wireless transmission of data from existing transducers
- Up to two transducer inputs per Wireless Transducer Reader
- Support for various analog inputs (0-5V, 0-10V and 4-20mA)
- Uses robust and highly optimized industrial DSSS radio and protocol with antenna and frequency diversity
- One-time calibration and setup
- Standard 110-240VAC powered or battery powered
- Wireless data connects seamlessly to Airgas EnviroSystems server
- No new software to install—data can be viewed using standard web browser
- FCC, RoHS and ETSI compliant
- Optional NEMA4/IP66 ruggedized enclosure for industrial environments
- Optional connectivity to existing building or plant automation systems via OPC or BACnet

Wireless Transducer Reader Configurations



MONITORING SYSTEMS

Wireless Monitoring

Wireless Transducer Reader Cont.

WIRELESS TRANSDUCER READER (WTR-100)

Specifications	
Data Inputs:	0-5V, 0-10V, 4-20mA, optional RS232 or RS485
Number of Inputs:	Up to two transducer inputs per WTR
Data Capture Rate:	User-configurable
Wireless Frequency:	2.4GHz Direct Sequence Spread Spectrum, 100mW peak output
Wireless Range:	Up to 1600ft (488m), high interference immunity, extendable with repeaters
Wireless Protocol:*	Airgas's highly optimized industrial DSSS radio and protocol. Integrates robust security, antenna and frequency diversity, optional encryption and minimal interference with existing wireless systems.
Approvals:	FCC Class B compliant, RoHS, ETSI compliant
Power Supply:	Standard 110-240VAC or battery powered
Battery Life:	> 2 years @ 1 sample per min, >5 years @ 1 sample per hour (approximate)
Humidity:	10-99%RH, non-condensing
Operating Temperature:	-4°F to 158°F (-20°C to 70°C)
Storage	Temperature: -40°F to 185°F (-40°C to 85°C)
Enclosure:	Rugged extruded aluminum industrial chassis (optional NEMA4/IP66 enclosure)
Dimensions:	5.7" x 2.2" x 1.6" (145mm x 57mm x 42mm)
Weight:	0.51 lbs (230g)

*All wireless devices use Airgas's industry-leading frequency agile protocols providing unmatched interference immunity and co-location capabilities.

OUR FAMILY OF PRODUCTS:

WIRELESS PNEUMATIC THERMOSTAT (WPT)	WIRELESS GAUGE READER (WGR-100)	WIRELESS STEAM TRAP MONITOR (WSTM-100)	WIRELESS FREEZER MONITOR (WFM-100)	WIRELESS TRANSDUCER READER (WTR-100)	BLUE BOX SERVER (BBS-100)

Mechanical Freezer Monitor

Wireless Monitoring

MONITORING SYSTEMS

Description: Monitor the overall status of your freezers to predict freezer failures before they occur so you don't lose critical materials or samples.

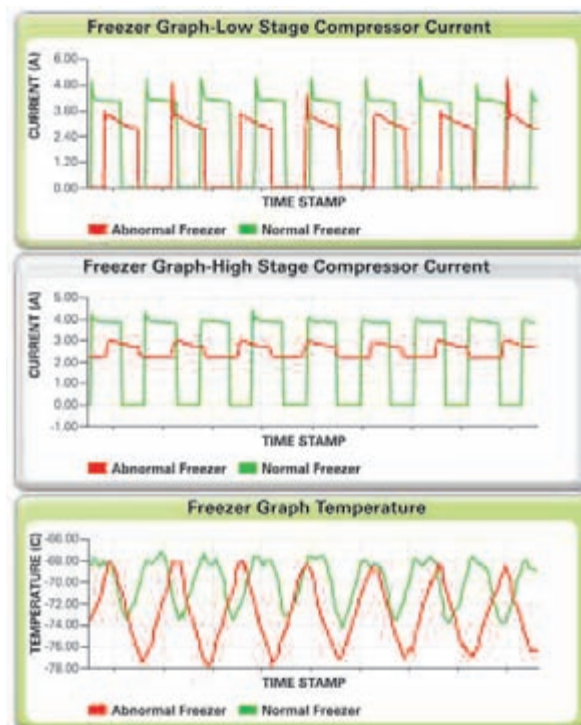
Freezer failures can result in loss of critical materials or samples. However, this can be avoided. Monitoring temperature alone does not give you enough advanced warning to know when a freezer is about to fail. It is merely an indicator that a problem has already occurred.

The Airgas Wireless Freezer Monitor (WFM) allows you to monitor critical parameters to determine freezer functioning status. By monitoring the internal temperature as well as the door switch status and compressor current draw (high and low side), you can see problems before they result in failures.

No more moving samples at the last minute as your freezers are failing. You can schedule maintenance before it becomes critical. There's no new software to install. Simply open a web browser and you can view the data or set alarms in minutes. Alternatively, you can connect the system to your existing building or plant automation system using industry standard protocols.

Design Features

- Monitor status of freezers holding critical material or samples
- Predict costly freezer failures before they occur
- Provide early warning of freezer failure
- Minimize required preventative maintenance
- Measure critical freezer parameters including high-stage and low-stage compressor current, door open/close status, and internal temperature
- Retrofit installation on existing freezers
- One-time calibration and setup
- No running wires for monitoring
- Battery life of 3+ years
- Uses robust and highly optimized industrial DSSS radio and protocol with antenna and frequency diversity
- No new software to install—data can be viewed using standard web browser
- FCC, RoHS and ETSI compliant
- Optional connectivity to existing building or plant automation systems via OPC or BACnet



MONITORING SYSTEMS

Wireless Monitoring

Mechanical Freezer Monitor Cont.

WIRELESS FREEZER MONITOR (WFM-100)

Specifications	
Analog Data Inputs:	User-configurable: Typically internal temperature, door switch, high side compressor current, low side compressor current
Number of Inputs:	Up to four inputs per WFM
Data Capture Rate:	User-configurable
Thermocouple:	Type K, -328°F to 482°F (-200°C to 250°C)
Current Sensor:	Standard: Split core, 0-20A DC. Other current sensors available upon request.
Wireless Frequency:	2.4GHz Direct Sequence Spread Spectrum, 100mW peak output
Wireless Range:	Up to 1600 ft (488 m), high interference immunity, extendable with repeaters
Wireless Protocol:*	Airgas's highly optimized industrial DSSS radio and protocol. Integrates robust security, antenna and frequency diversity, optional encryption and minimal interference with existing wireless systems.
Approvals:	FCC Class B compliant, RoHS, ETSI compliant
Power Supply:	Standard 110-240VAC or battery powered
Battery Life:	>3 years (approximate)
Humidity:	10-99%RH, non-condensing
Operating Temperature:	-4°F to 158°F (-20°C to 70°C)
Storage Temperature:	-40°F to 185°F (-40°C to 85°C)
Enclosure:	Rugged extruded aluminum industrial chassis (optional NEMA4/IP66 enclosure)
Dimensions:	5.7" x 2.2" x 1.6" (145mm x 57mm x 42mm)
Weight:	0.51 lbs (230g)

*All wireless devices use Airgas's industry-leading frequency agile protocols providing unmatched interference immunity and co-location capabilities.

OUR FAMILY OF PRODUCTS:

					
WIRELESS PNEUMATIC THERMOSTAT (WPT)	WIRELESS GAUGE READER (WGR-100)	WIRELESS STEAM TRAP MONITOR (WSTM-100)	WIRELESS FREEZER MONITOR (WFM-100)	WIRELESS TRANSDUCER READER (WTR-100)	BLUE BOX SERVER (BBS-100)

Engineering the Right Solutions



StatusChecker

Description: The Airgas StatusChecker™ provides a cost-effective solution for monitoring a variety of data related to laboratory gas and cryogenic liquid supply. The system provides constant status of your gas supply using your computer network, as well as automatically emailing notifications to up to 10 email addresses that the pressure in your gas supply has dropped below the reorder point. The StatusChecker can also be used to monitor any dry contact, such as a freezer door, and provide notification when the contact is opened or closed, depending on how you configure the setting.

The StatusChecker also gives you an option that allows you to set up a wallpaper status bar on your computer that gives you a visual indication of the eight monitoring points. Status bars display green when not in alarm status and will change to red when the contact goes into alarm.

The unit comes preprogrammed with a self-executing software for easy installation. The user is prompted to input names for the eight contacts, as well as the email addresses, along with a preprogrammed wav file that gives an audio/vocal alarm when one of the contacts goes into alarm. The wav file can be easily replaced by a user-recorded wav file for a specific audio alarm alert.

When the StatusChecker is monitoring your gas supply and the pressure drops below the set pressure on the indicating pressure switch, a wav file is launched and a verbal message is given telling you the supply pressure is at the reorder point. A message also appears on your screen indicating that email notifications have been sent.

The system can be configured to email up to 10 email accounts per monitored contact. Each monitored contact is given a unique name during the easy installation. Recipients of the email notifications can be a purchasing department, the local Airgas replenishment group, the maintenance group that would change out cylinders, or anyone who has a valid account. The system easily connects to a computer/network with an active email account. The account must be open for the system to function properly. If the computer is shut off when the event occurs, it will notify everyone when the computer is back on line.

Gas Monitoring

STATUSCHECKER



The StatusChecker can also be used to monitor any contact switch, such as a cryogenic freezer door. The StatusChecker can notify you whenever the door is opened and provide a log of every time the event occurs.

The StatusChecker comes in multiple configurations and can monitor up to eight contacts with one box. There is also a StatusChecker that monitors two contacts and provides both a visual and audible alarm in addition to the emailing notification capabilities.

Specifications

StatusChecker™/Smart Alarm Combo - Monitoring Capabilities: 2 contacts, 2-contact version has additional local audio and visual alarms. (This unit also requires 120VAC power.)

StatusChecker Monitoring Capabilities: 8 contacts

Power Requirements: USB Powered (The StatusChecker is powered by the USB port.) (The Smart Alarm box requires 120VAC for its function. You will need a separate specification list for the 2-contact unit w/alarm box.)

Connections components are interconnected with standard 20 awg wire.

Environmental Classification: NEMA-4X/IP-65 with optional IP-65 cable glands

Ordering Information	
Product Number	Description
Y78-EMAILER	StatusChecker box only with capabilities to monitor up to (8) points
Y19-125D30PS	Brass Indicating Pressure Switch 0 – 3000 psi ¼" mnpt LM
Y19-125C60PS	Brass Indicating Pressure Switch 0 – 600 psi ¼" mnpt LM
Y19-125C20PS	Brass Indicating Pressure Switch 0 – 200 psi ¼" mnpt LM
Y78-EMLRD30	StatusChecker box, includes (1) 0 – 3000 psi indicating brass pressure switch, w/¼" fnpt connection, and 18" wire leads
Y78-EMLDRC20	StatusChecker box, includes (1) 0-200 psi indicating brass pressure switch w/¼" fnpt connection, and 18" wire leads
Y78-EMLDRC60	StatusChecker box, includes (1) 0-600 psi indicating brass pressure switch w/¼" fnpt connection, and 18" wire leads

CO₂ Sentry

Gas Detectors

MISCELLANEOUS EQUIPMENT

Description: The CO₂ Sentry is designed to detect the presence of carbon dioxide in ambient air and warn individuals in confined spaces of an unsafe condition. Carbon Dioxide (CO₂) is a colorless, odorless gas which normally exists in air. High concentrations of CO₂ in confined spaces are dangerous, and may lead to health problems ranging from headaches and fatigue to asphyxiation and death. An audible alarm and visual indication activate when CO₂ concentration reaches a pre-set notification level. Detection of high levels of CO₂ will also activate a relay that could be used for a fan to ventilate the confined space and reduce CO₂ concentrations in the area. The CO₂ monitor can be used in cellars, breweries, beverage dispensing areas, incubator applications and CO₂ storage rooms.

Design Features

- **Non-Dispersive Infra-Red technology**
used to measure CO₂ concentration up to 50,000 ppm
- **Easy-to-read digital display**
clearly indicates ambient CO₂ concentrations
- **Dual mode integrated Alarms**
provide both audible and visual indication
- **Relay output**
can automatically control a fan to ventilate a confined space
- **Weatherproof design**
provides protection from dust and water entry
- **Minimum sensor life of 5 years**

Temperature Specifications

Temperature Range	Display 32°F to 122 °F (0 °C to 50 °C)
Display Resolution	0.1°F (0.1 °C)
Display Options	°F / °C
Accuracy	± 2 °F (±1 °C)
Response Time	20-30 minutes (case must equalize with environment)

Operating Specifications

Operating Temperature	32°F to 122 °F (0 °C to 50 °C)
Humidity Range	0 ~ 95% RH non-condensing
Altitude Range	0 ~ 600 m (0 ~ 1969ft) without compensation



INT-CO2MNTRV1 pictured

CO₂ Specifications

Measurement Range	0 – 50,000 ppm (5%) display
Display Resolution	10 ppm
Accuracy	± 100 ppm or ± 5% of reading
Repeatability	± 20 ppm @ 400 ppm
Annual Drift	<20 ppm/Year
Temperature Dependence	±0.2% of reading per °C or ± 2 ppm per °C, whichever is greater, referenced to 25 °C
Pressure Dependence	0.13% of reading per mm Hg (corrected via user input for altitude)
Response Time	<60 seconds for 90% response to step change
Warm-Up Time	<60 seconds at 22 °C

Single-Stage Ordering Information

Product Number	Description	Dimensions	Power Supply
INT-CO2MNTRV1	Sentry CO ₂ Ambient Gas Detector with Remote Display Unit	Sensor Unit: 4.75"H x 7.0"W x 1.75"D Sensor Unit: 4.75"H x 3.2"W x 1.0"D	AC adapter 110/220 VAC

Monitoring Devices

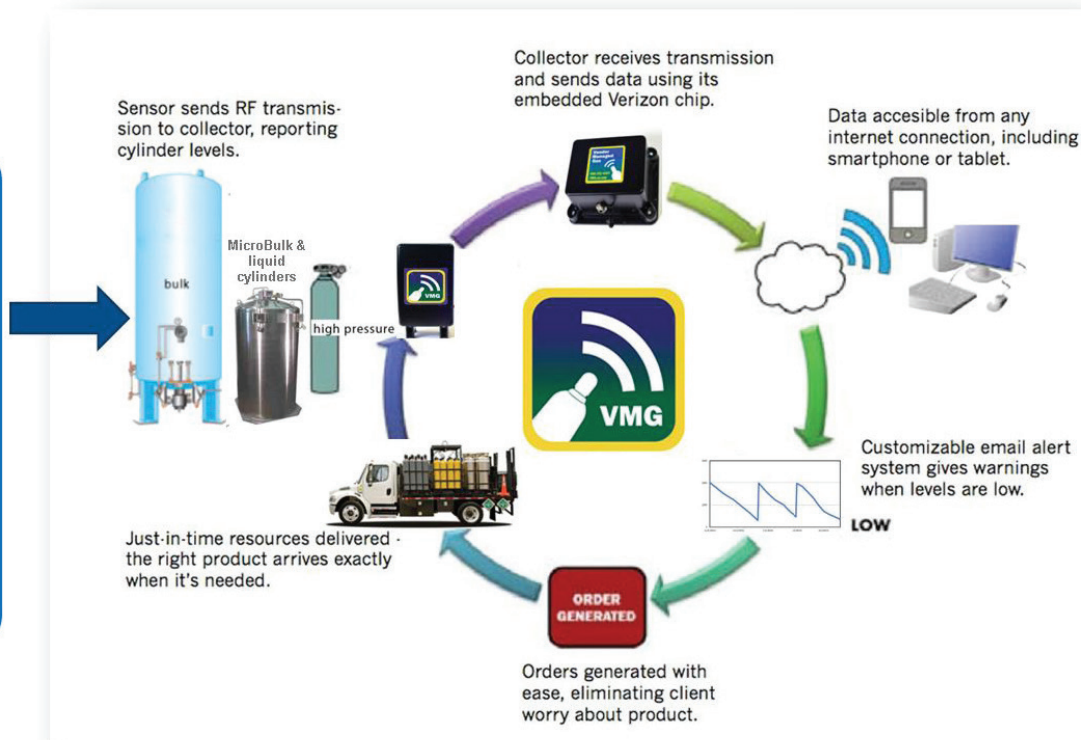
Vendor Managed Gas

Vendor Managed Gas

VMG units on each tank or cylinder measure:



- ✓ Gas levels
- ✓ Ambient temperatures
- ✓ Pressures
- ✓ High flow



Description: Airgas and Vendor Managed Gas have partner to provide a low cost monitoring program for cylinder and bulk applications. A complete system can be preconfigured and installed on our regulators and change over manifolds before they are shipped. This allows for easy start up and instantly providing you information on your gas usage, and eliminates any worries or hassles of running out of gas to your applications, as well not having to install the readers and create the network.

The system can encompass readings for your gas cylinders, MicroBulk, and cryogenic liquid tanks. This one system can gather all of your data, format it into easy to read reports that allow you and Airgas to better manage your business and ensure there are no run outs.

The system will provide you daily customizable reports of your current pressure, usage, email warnings of run out, high usage or leaks. Data can be shared with people within your organization as it is accessible via the internet.

Design Features

- Ability to monitor
- High Pressure cylinders
- Low Pressure cylinders
- MicroBulk tanks
- Bulk tanks
- Liquid Cylinder
- Beverage

Key Uses

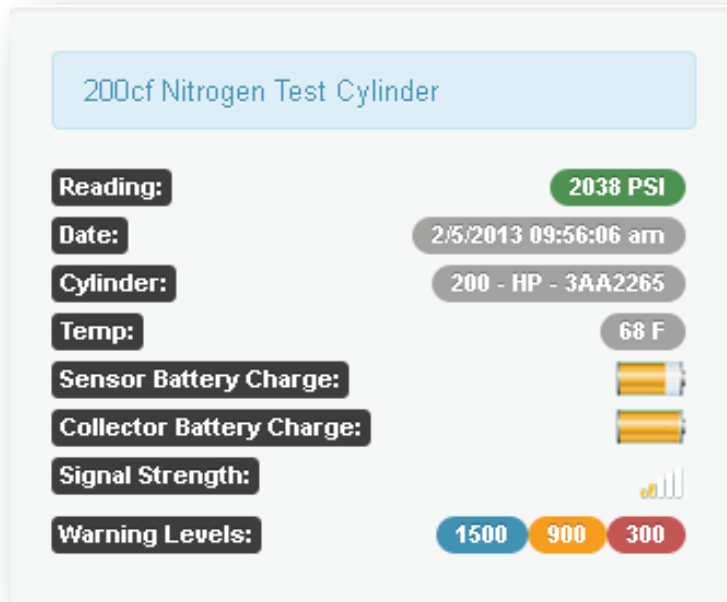
- EPA protocol gas standards
- Specialty gas
- Customers who request same day deliveries
- Ability to work with a variety of tanks and cylinders sizes and pressures
- Ability to use data for forecasting run out and reduce on hand inventory of gas cylinders
- Data analytics

Monitoring Devices

Vendor Managed Gas

Vendor Managed Gas (Cont.)

Airgas/VMG Control Room monitors your gas supply
Customizable alerts that give warnings when levels are low



Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

E³ Point Oxygen Gas Detector

Oxygen Detector

GAS DETECTION



Description: The E³ Point Gas Detector is an efficient, economical choice for detecting oxygen content in gas rooms, laboratories and storage areas. The E³ Point allows your operation to run more intelligently to protect people, property and your bottom line.

The plug and play sensor is factory calibrated and works out of the box. Upon installation, the E³ Point automatically configures for a quick operation. You benefit from easier installation and maintenance, and greater adaptability to changing building and safety requirements.

The E³ Point comes in a standalone version with horn and strobe package. It can also be equipped with a remote sensor head for extra protection against oxygen deficient or enriched atmospheres.

Specifications for Regulators

Size (base unit with sensor)	8.09 x 5.87 x 2.65" (HxWxD)
Size (remote sensor)	1.36 x 1.75 x 2.56" (HxWxD)
Operating Voltage	120 VAC nominal
Visual Indicators	Digital readout of gas concentration; green and amber LEDs for alarms and faults
Relays	3 relays x 5A @ 250VAC
Analog Output	4-20 mA

Design Features

Single or dual oxygen sensor configurations: for 0–25% oxygen detection
 Backlit LCD display: allows for readout of oxygen levels
 LED indicators: provides visual indication of alarms or faults
 Horn and strobe: allows for remote audio/visual alarm outside monitoring area

Ordering Information

Product Number	Configuration
V89 ES1592	Base unit for oxygen detection; includes horn/strobe package
V89 ES2099	Base unit & remote sensor head for oxygen detection; includes horn/strobe package

Other configurations for gases are available. Please consult with Airgas Engineering Solutions for details.

Please call 1-800-282-1524 for technical sales and support of this product.

Midas® Gas Detector

Extractive Sampling

GAS DETECTION



Description: The Midas® is a gas monitoring system for fast and reliable response to the presence of virtually all of the gases used in laboratory, manufacturing, chemical or other industrial applications. Midas® offers lower cost of ownership benefits for gas detection through a combination of extended sensor calibration periods, flexible communications architecture and patented diagnostics that monitor sensor performance and flow control.

Midas® is a universal transmitter platform that detects the majority of toxic, ambient and flammable gases that must be monitored in a typical industrial process environment. The pre-calibrated “plug and play” smart sensor cartridge makes sensor replacement quick and easy. Bright LED lights and an icon driven menu guarantee instant alert to the gas reading or alarm level.

Midas® is compact in size, making installation simple with its easy access metal chassis design. The unit can monitor points up to 100 ft. away from the transmitter due to its extractive pump design.

Specifications	
Size (unit with sensor)	120x63x150 mm (HxWxD)
Weight (unit with sensor)	0.8 kg
Operating Voltage	24 VDC nominal
Visual Indicators	Alarm, power and fault lights; back lit LCD display
Relays	3 relays for alarm 1, alarm 2 and fault
Analog Output	4-20 mA

Design Features

- Smart sensor cartridge:** comes calibrated for a specific gas, 2 year warranty on sensor
- Extractive sampling detector:** onboard pump allows for monitoring of gas up to 100 ft. away
- Backlit LCD display and LED lights:** provides readout of gas levels and alarm indication
- Chassis design:** allows for easy change of gas sensor cartridge

Ordering Information		
Product Number	Gas	Range
V89 811172	Hydrogen	0-100% Lower Explosive Limit (LEL)
V89 811173	Oxygen	0-25% volume
V89 811434	Carbon Monoxide	0-100 parts per million (ppm)
V89 811393	Ammonia	0-100 parts per million (ppm)

Other configurations for gases are available. Please consult with Airgas Engineering Solutions for details.

Please call 1-800-282-1524 for technical sales and support of this product.

Sensepoint XCD Gas Detector

Gas Detection System Packages

GAS DETECTION



Description: The Sensepoint XCD Package comes complete with two gas detectors and a two channel HA20 controller.

The XCD detectors provide comprehensive monitoring of flammable, toxic and oxygen gas hazards. A tri-color backlit LCD clearly indicates the status of both units. Each detector comes with two programmable alarm relays, one programmable fault relay as well as an industry standard 4-20 mA output.

The HA20 controller can accept inputs from both XCD units and will serve as a means to power the detectors, provide local readouts of gas concentrations, and alert personnel when a leak has been detected. The HA20 comes with three common alarm relays for connection to a building automation system or remote alarm.

Sensepoint XCD Specifications	
Size (unit with sensor)	225x164x99 (HxWxD)
Weight (unit with sensor)	2.0 kg (aluminum alloy housing)
Operating Voltage	16 to 32 VDC (24 VDC nominal)
Visual Indicators	Digital readout of gas concentration; back lit display
Relays/Analog Output	3 relays x 5A @ 250VAC/4-20 mA
Electrical Certification	UL/cUL Class 1, Div 1, groups B, C, D

HA20 Specifications	
Size	14.1 x 12.14 x 7.25" (HxWxD)
Weight	5 lbs.
Operation Voltage	120 VAC
Display	128 x 64 pixel graphic LCD with backlight displays
Common Alarm Relays	Two, 5 amp 30 VDC or 250 VAC resistive Form C
Housing	NEMA 4X polycarbonate

Ordering Information		
Product Number	Gas	Range
V89 ES2261	Flammables	0-100% Lower Explosive Limit (LEL)
V89 ES2262	Oxygen	0-25% volume
V89 ES2263	Carbon Monoxide	0-100 parts per million (ppm)
V89 ES2264	Hydrogen	0-1000 parts per million (ppm)

Other configurations for gases are available. Please consult with Airgas Engineering Solutions for details.

Please call 1-800-282-1524 for technical sales and support of this product.

HA Series Controllers

Gas Detector Controllers

GAS DETECTION



Description: The HA series controls, monitors and alarms up to 16 different gas detectors. The digital controller family delivers robust safety while being cost effective.

All controllers are designed to provide simultaneous display and alarm functions for gas detectors. A graphic LCD display shows monitored data. A touch-and-magnetic keypad allows for non-intrusive operation in potentially hazardous locations. The controllers feature three adjustable alarm levels per channel along with a strobe and horn for additional safety.

There are three models in the HA series. The HA20 controller can handle up to two channels (detectors). The HA40 can accept up to four channels. The HA71 can be configured to receive either eight or 16 channels. Options such as additional relays and output are available upon request.

HA20 & HA40 Specifications	
Size	14.1 x 12.14 x 7.25" (HxWxD)
Weight	5 lbs.
Operating Voltage	120 VAC nominal
Display	128 x 64 pixel graphic LCD with backlight displays
Common Alarm Relays	Two, 5 amp 30 VDC or 250 VAC resistive Form C
Housing	NEMA 4X polycarbonate

HA71 Specifications	
Size	16 x 13.16 x 8.5" (HxWxD)
Weight	17 lbs.
Operating Voltage	120 VAC
Display	128 x 64 pixel graphic LCD with backlight displays
Common Alarm Relays	Two, 5 amp 30 VDC or 250 VAC resistive Form C
Housing	NEMA 4X polycarbonate

Design Features

LCD display: provides remote readings of gas detector concentrations
Internal power supply: capable of powering multiple gas detectors
Horn and strobe: allows for remote audio/visual alarm outside monitoring area
Options for additional relays and 4-20 mA outputs available

Please call 1-800-282-1524 for technical sales and support of this product.

Gas Detection

Ordering Information	
Product Number	Configuration
V89 ES1921	HA20 Two Channel Gas Detector Controller
V89 ES1906	HA40 Four Channel Gas Detector Controller
V89 ES2170	HA71 Eight Channel Gas Detector Controller
V89 ES2171	HA71 Sixteen Channel Gas Detector Controller

Other configurations for gases are available. Please consult with Airgas Engineering Solutions for details.

Midas® Package

Gas Detection System Packages

GAS DETECTION



Description: The Midas® Package comes complete with two gas detectors and a two channel HA20 controller.

Midas® is a universal transmitter platform that detects the majority of toxic, ambient and flammables gases that must be monitored in a typical industrial process environment. The pre-calibrated “plug and play” smart sensor cartridge, icon driven menu and compact size make it an excellent choice for a variety of gas detection needs.

The HA20 controller can accept inputs from both Midas® units and will serve as a means to power the detectors, provide local readouts of gas concentrations and alert personnel when a leak has been detected. The HA20 comes with three common alarm relays for connection to a building automation system or remote alarm.

Midas® Specifications	
Size (unit with sensor)	120x63x150 mm (HxWxD)
Weight (unit with sensor)	0.8 kg
Operating Voltage	24 VDC nominal
Visual Indicators	Alarm, power and fault lights; back lit LCD display
Relays/Analog Output	3 relays for alarm 1, alarm 2 and fault
Analog Output	4-20 mA

HA20 Specifications	
Size	14.1 x 12.14 x 7.25" (HxWxD)
Weight	5 lbs.
Operation Voltage	120 VAC
Display	128 x 64 pixel graphic LCD with backlight displays
Common Alarm Relays	Two, 5 amp 30 VDC or 250 VAC resistive Form C
Housing	NEMA 4X polycarbonate

Ordering Information		
Product Number	Gas	Range
V89 ES2265	Hydrogen	0-100% Lower Explosive Limit (LEL)
V89 ES2266	Oxygen	0-25% volume
V89 ES2267	Carbon Monoxide	0-100 parts per million (ppm)
V89 ES2268	Ammonia	0-100 parts per million (ppm)

Other configurations for gases are available. Please consult with Airgas Engineering Solutions for details.

Please call 1-800-282-1524 for technical sales and support of this product.

Sensepoint XCD Gas Detector

Diffusion Sampling

GAS DETECTION



Description: The Sensepoint XCD detector provides comprehensive monitoring of flammable, toxic and oxygen gas hazards in potentially explosive atmospheres, both indoors and outdoors. Users can modify detector operation using the LCD and magnet switches without ever needing to open the unit. This enables one-man, non-intrusive operation and reduces routine maintenance time and costs.

A tri-color backlit LCD clearly indicates the unit's status at a glance, even from a distance. A steady green backlight indicates normal operation, flashing yellow indicates fault and flashing red indicates an alarm.

All detectors are supplied pre-configured and include two programmable alarm relays, one programmable fault relay as well as an industry standard 4-20 mA output (sink or source selectable).

Specifications	
Size (unit with sensor)	225x164x99 mm (HxWxD)
Weight (unit with sensor)	2.0 kg (aluminum alloy housing)
Operating Voltage	16 to 32 VDC (24 VDC nominal)
Visual Indicators	Digital readout of gas concentration; back lit display
Relays/Analog Output	3 relays x 5A @ 250VAC/4-20 mA
Electrical Certification	UL/cUL Class 1, Div 1, groups B, C, D

Design Features

Versatile detector: sensors available for flammable, toxics, oxygen and carbon dioxide
Rugged housing: for indoor or outdoor use
Backlit LCD display: provides readout of gas levels; green/yellow/red colors indicate alarm status

Gas Detection

Ordering Information		
Product Number	Gas	Range
V89 811133	Flammables	0-100% Lower Explosive Limit (LEL)
V89 811134	Oxygen	0-25% volume
V89 811200	Carbon Monoxide	0-100 parts per million (ppm)
V89 812507	Hydrogen	0-1000 parts per million (ppm)

Other configurations for gases are available. Please consult with Airgas Engineering Solutions for details.

Please call 1-800-282-1524 for technical sales and support of this product.

Header Manifolds

Engineering the Right Solutions



Headers

MANIFOLDS

Airgas 4- or 6- Cylinder General Purpose Brass Series
Airgas 4- or 6- Cylinder High-Purity Brass Series
Airgas 4- or 6- Cylinder High-Purity Stainless Steel Series
Airgas 6,000 psi header 4- or 6- Cylinder Stainless Steel

Description: The Airgas® series of high-pressure manifold assemblies permits the connection of up to six cylinders to a common outlet. These manifolds come in both a 3,000 psig mawp as well as a 6,000 mawp rating. Each cylinder location is equipped with a 30-inch flexible pigtail, a manual shut off valve at the header. The 3k series uses a packless diaphragm-type isolation valve, and the 6k series a needle valve. A check valve CGA cylinder connection is standard on the 3k; a check valve is included on 6k series. The check valve included with the 3k and 6k series allows any cylinder to be changed at any time without interrupting the supply of product to the user's process. A CGA fitting is provided on the left end of the manifold (right-hand units available upon request) for connection of a regulator (supplied separately).



3,000 psi Stainless Steel Series Shown

Design Features

Trouble-free Wall Mounting Assembly

Easy Change Out

no interrupted supply of product to user's process.

CGA regulator fitting provided on left end of manifold
right-hand units available upon request.

Materials

Manifold	Brass, Stainless Steel
Header Valve	Brass, Stainless Steel
Valve Seat	PTCFE
Pigtails	Synflex®, Armored 316 Stainless Steel
CGA Fittings	Brass, Stainless Steel with integrated check valve on 3k series non check valve on 6k series
Check Valves	Viton® O-rings

Specifications

Max Rated Inlet Pressure	3,000 psig (209 bar) or 6,000 psig see ordering information
Ambient Operating Temperature	-40° F to 160° F (-40° C to 71° C)
Available CGA Connections	320, 350, 540, 580, 590, 677
Pigtail Length	30"

Ordering Information

Product Number	Num. of Cylinders	Manifold Material	Max Pressure (psig)	Pigtail Material	CGA Material	Header Valve Material
Y15-2154(CGA)**	4	Brass	3,000	Synflex®	Brass	Brass
Y15-2156(CGA)**	6	Brass	3,000	Synflex®	Brass	Brass
Y15-2444(CGA)	4	Brass	3,000	Stainless Steel	Brass	Brass
Y15-2446(CGA)	6	Brass	3,000	Stainless Steel	Brass	Brass
Y15-4454(CGA)	4	316 SS	3,000	Stainless Steel	Stainless Steel	Stainless Steel
Y15-4456(CGA)	6	316 SS	3,000	Stainless Steel	Stainless Steel	Stainless Steel
Y15-6K444(CGA)	4	316 SS	6,000	Stainless Steel	Stainless Steel	Stainless Steel
Y15-6K446(CGA)	6	316 SS	6,000	Stainless Steel	Stainless Steel	Stainless Steel

**not available with CGA 540

Please call the Specialty Gas Equipment Technology Center at 800-939-5711 for assistance in specifying these optional accessories.

Available Options

Description

Pressure Regulators
Flash Arrestors
Tee-Purge Assemblies
Cross Purge Assemblies
Pressure Switches
Alarm Panels

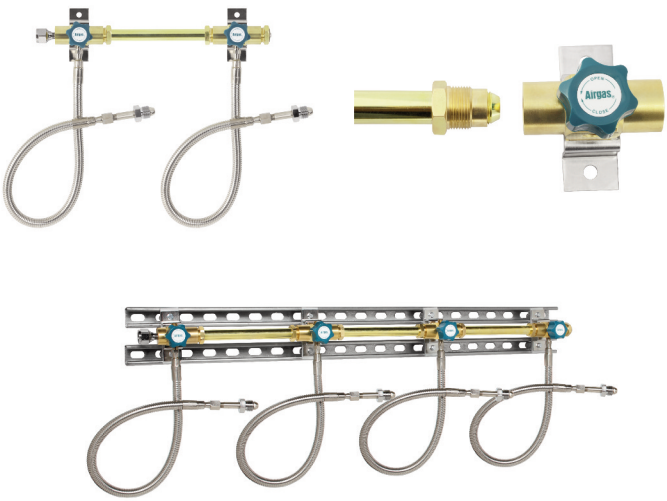


Modular High-Pressure Manifolds

Description: These unique Airgas modular manifold assemblies use a proprietary high integrity method to connect sections to form a manifold, without any welding or brazing of metal. This design allows for quick delivery, easily assembled into straight, L- or U- shape configurations. These manifolds may also be reconfigured into the field to add or remove sections or reconfigure the shape of the manifold. Each cylinder location is equipped with a 30-inch flexible pigtail, a manual diaphragm-type isolation valve and a check valve at the CGA cylinder connection. Any cylinder may be changed at any time without interrupting the supply of product to the user's process. A CGA fitting is provided on the left end of the manifold (right-hand units available upon request) for connection of a regulator (supplied separately). The manifold comes with mounting hardware for easy mounting.

Headers

MANIFOLDS



Specifications

Max Rated Inlet Pressure	3,500 psig (241 bar)
Ambient Operating Temperature	-40° F to 160° F (-40° C to 71° C)
Available CGA Connections	320, 350, 540, 580, 590

Materials

Manifold	Brass and Stainless Steel
Header Valve	Brass, Stainless Steel
Valve Seat	PTCFE
Pigtails	Armored 316 Stainless Steel
CGA Fittings	Brass, Stainless Steel with integrated check valve
Check Valves	Viton® O-rings

Design Features

Configurations

Straight, L- or U-shaped, wall or floor mounted configurations available.

Trouble-free Wall Mounting Assembly

Wall mounting brackets attached to each valve.

Easy Change Out

No interrupted supply of product to user's process.

CGA Regulator Fitting Provided on Left End of Manifold

Right-hand units available upon request.

Part numbers reflect left-to-right flow, please call for other configurations.

Ordering Information

Product Number	Num. of Cylinders	Manifold Material	Max Pressure (psig)	Pigtail Material	CGA Material	Header Valve Material
Y15-2MM2(CGA)	2	Brass	3,500	Stainless Steel	Brass	Brass
Y15-2MM4(CGA)	4	Brass	3,500	Stainless Steel	Brass	Brass
Y15-2MM6(CGA)	6	Brass	3,500	Stainless Steel	Brass	Brass
Y15-4MM4(CGA)	4	316 SS	3,500	Stainless Steel	Stainless Steel	Stainless Steel
Y15-4MM6(CGA)	6	316 SS	3,500	Stainless Steel	Stainless Steel	Stainless Steel

***Call 800-939-5711 for other configurations

Please call the Specialty Gas Equipment Technology Center at 800-939-5711 for assistance in specifying these optional accessories.

Available Options

Description

Pressure Regulators
Flash Arrestors
Tee-Purge Assemblies
Cross Purge Assemblies
Pressure Switches
Alarm Panels

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Modular Point of Use Panels

Description: Airgas' modular point of use panels function as building blocks and allow you to customize a gas distribution system in your laboratory. These panels consist of any combination of regulator, purifiers and outlet panel to meet your requirement. The modular design, consist of individual panels that snap onto a chase that allows for wall or bench top installation. This provides flexibility while minimizing overall component installation cost.

Regulator Module consists of a high purity pressure regulator, gauge, and purifier by-pass valve. Flexible tubing allows for easy panel access for future up-grades or modifications.

Purifier Module provides additional protection against contaminants. A variety of configurations are offered that include indicating moisture, hydrocarbon, oxygen and indicating oxygen traps.

Outlet Module accommodates up to 5 outlets valves or connections for same gas. Panels are pre-drilled to accommodate a variety of configurations. Laminate overlay is installed over holes to provide a quality appearance.



Modular Panels

POINT OF USE PANELS

Materials

Regulator/Valve Body	316 stainless steel or brass
Bonnet	Nickel-plated brass
Diaphragm	316 stainless steel
Seat	PTFE
Gauges	Stainless steel or brass
Panel	14 gauge steel
Finish	Epoxy white paint

Specifications

Maximum Inlet Pressure	250 psig
Operating Temperature	-40F to 140F
Flow Coefficient	Cv = 0.15
Panel Inlet Connection	¼" Compression Fitting
Panel Outlet Connection(s)	¼" Compression Fitting
Gauge Size	2 ½" dial face

Design Features

- Flexible Design - panels can be mounted on a wall, lab bench or ceiling
- Convenience - provides control of gas pressure, purity and gas distribution at point of use
- Ease of installation - panels are mounted on a chasis

Ordering Information

Product Number	Material of Construction	Number of Outlets	Purifier Module (*)	Delivery Pressure (psig)	Delivery Pressure Gauge (psig)
	Brass	2	Indicating Moisture and Hydrocarbon	0-100	0-200
	Brass	3	Indicating Moisture and Hydrocarbon	0-100	0-200
	Brass	4	Indicating Moisture and Hydrocarbon	0-100	0-200
	Brass	5	Indicating Moisture and Hydrocarbon	0-100	0-200
	Stainless Steel	2	Indicating Moisture and Hydrocarbon	0-100	0-200
	Stainless Steel	3	Indicating Moisture and Hydrocarbon	0-100	0-200
	Stainless Steel	4	Indicating Moisture and Hydrocarbon	0-100	0-200
	Stainless Steel	5	Indicating Moisture and Hydrocarbon	0-100	0-200

- Other purifier options available

Custom modifications are available for other regulator, purifier and valve outlet module configurations.

Specialty Gases and Equipment
Product Reference Guide

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Cryogenic Freezer Manifold

Liquid Nitrogen Freezer Supply

MANIFOLDS

Description: These manifolds are designed specifically to supply liquid nitrogen to freezers. The manifolds have safety relief valves to prevent the pipe from rupturing if liquid nitrogen becomes entrapped between the shut-off valve and the freezer solenoid valve.

The header is made from ½" XHVY brass pipe. The safety reliefs valves are extended to a height to ensure they do not become encased in ice if the manifold developed an ice coating on the outside.

Some manifolds are complete with cryogenic hoses to connect to the freezer. Please refer to ordering information.

Specifications	
Headers	½" XHvy brass pipe
Safety Relief Valve Setting	75 psig
Inlet	CGA 295 female swivel
Outlet to Freezer	CGA 295 male



Available Options		
Product Number	Description	Connection Hoses to Freezer
Y15-LS1FZ1PT	One N2 Dewar Source x One Freezer Includes 6 ft hose	Yes
Y15-LS1FZ1	One N2 Dewar Source x One Freezer	No
Y15 LS1FZ1PS	One N2 Dewar Source x One Freezer w/(1)Liquid N2 Withdrawal Port CGA 295	Yes
Y15-LS1FZ2DWR	Two N2 Dewar Source x One Freezer	Yes
Y15-LS1FZ2DWR1PS	Two N2 Dewar Source x One Freezer w/(1)Liquid N2 Withdrawal Port CGA 295	Yes
Y15-LS1FZ2DWR	Two N2 Dewar Source x One Freezer	Yes
Y15 LS2FZ1DWR	One Liquid N2 Dewar Source x Two Freezers	Yes
Y15 LS3FZ2DWR	Two Liquid N2 Dewar Source x Three Freezers	Yes
Y15 LS4FZ1DWR	One Liquid N2 Dewar Source x Four Freezers	No
Y15 LS295R	CGA 295 Relief Assembly	N/A
Y15 LSCR250	Cryogenic Relief Valve Assembly with Candy Cane Tubing	N/A
Y15 LSX2V1R	Liquid N2 splitter mini manifold, (2) outlets and relief valve with one inlet CGA 295	No

Airgas CryoWiz

The Airgas 577 series CryoWiz™ delivers a continuous supply of liquid nitrogen from a primary and secondary source automatically with no temperature change. The CryoWiz uses a proprietary algorithm and precise pressure and temperature sensors to monitor the demand for and supply of the liquid nitrogen. With a unique insulated switching mechanism, high flow pneumatic valves, and hot gas bypass programming, the CryoWiz automatically switches sources with virtually no change in delivered cryogenic temperature. Ensuring both consistent temperature and continuous supply, the CryoWiz is ideal for critical cryogenic applications such as cryopreservation and environmental chambers

Cryogenic Liquid Manifold

Manifolds



Design Features

- **Automatic Proprietary Control Algorithm**
Ensures continuous efficient supply
- **Insulated Switching Mechanism**
Minimizes flow loss of liquid
- **High Flow Pneumatic Control Valves**
Supplies multiple freezers
- **Hot Gas Bypass**
Eliminates flow loss
- **Single Compact NEMA 12 Enclosure**
Occupies less space easy to install
- **Remote Monitoring**
USB and Ethernet communication
24,000 event date and time log
- **Oxygen Deficiency Relay Contact**
Ensures OSHA safe use
- **Local Audible and Visual Alarm**
On-board emergency monitoring
- **Optional Remote Alarm**

Materials

Enclosure	Powder coated NEMA 12
Internals	Brass bar stock
Cryogenic Relief Valves	50 PSIG (3.5 BAR) optional 1/2" FPT
Hot Gas Bypass	1/2" FPT
Maximum Inlet Pressure	35 PSIG (2.4 BAR) optional
Inlet Connection	1/2" FPT
Outlet Connection	1/2" FPT
Drain	1/2" PVC

Specifications

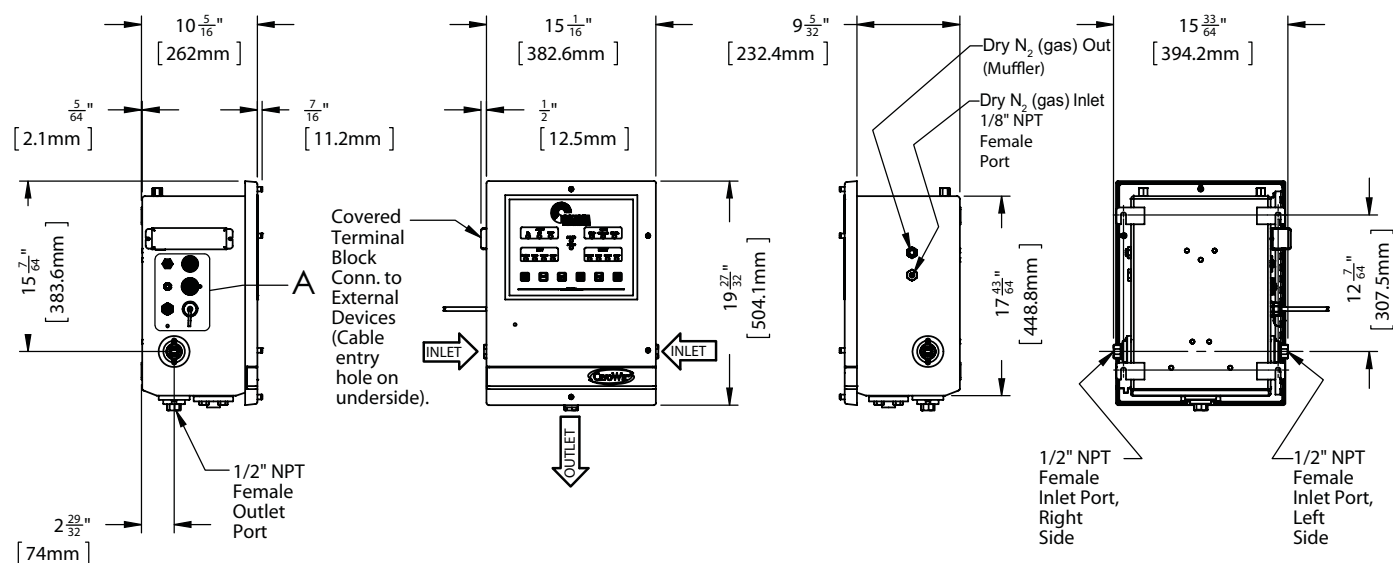
Alarm Output	1 or 5 dry contact NC
Alarm Inputs	Oxygen deficiency relay
Dry Nitrogen (Gaseous)*	105 PSIG (7 BAR) max 95 PSIG (5 BAR) min Inlet: 1/8" FNPT * Required for pneumatics
Communication Ports	USB (maintenance only) Ethernet (optional)
Power	90-264 VAC, 47-63 Hz (US, UK, European, Australian, and Chinese adapters included)
Weight	40 lbs (18 kg)

Airgas Quality Policy

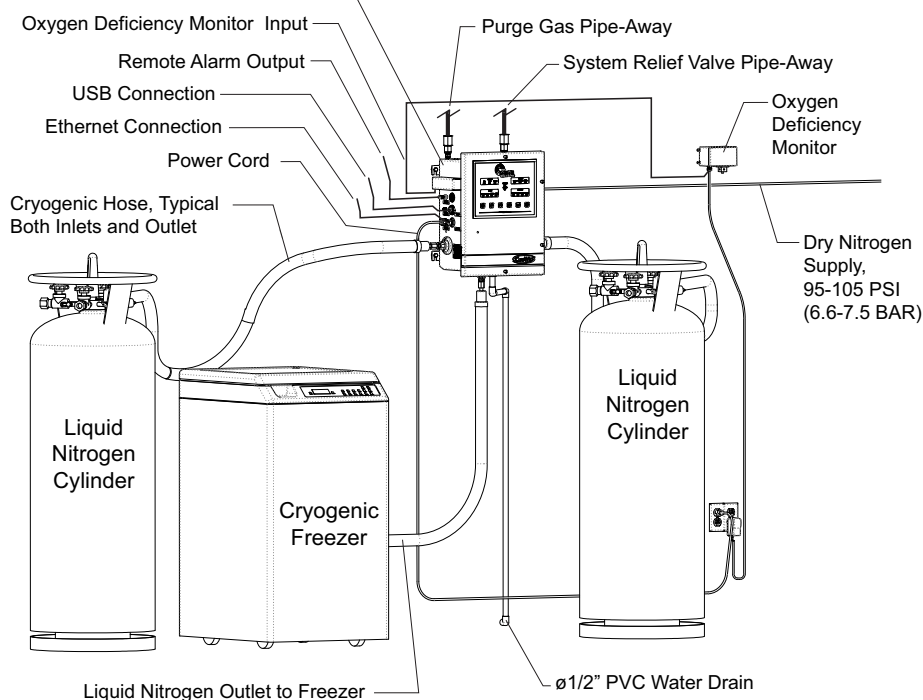
The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Specialty Gas Equipment

Airgas
an Air Liquide company



577 Series CryoWiz™



Ordering Information

Product Number	Description	Material
Y11-CP577N2	1 x 1 Liquid Nitrogen Manifold No Hose	Brass
Y11-CP577N236	1 x 1 Liquid Nitrogen Manifold w/36" Hose	Brass
Y11-CP577N248	1 x 1 Liquid Nitrogen Manifold w/48" Hose	Brass
Y11-CP577N272	1 x 1 Liquid Nitrogen Manifold w/72" Hose	Brass
Y40-DEFALARM	Oxygen Deficiency Alarm 110 VAC No Hose	

For additional hoses, configurations, options and technical support please call 1-800-939-5711

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Vacuum Jacketed Cryogenic Liquid Nitrogen Manifold for Cryogenic Freezers

Description: Airgas' stainless steel vacuum jacketed tank switcher provides a continuous liquid nitrogen supply by automatically switching to another dewar when the primary tank supplying the freezer becomes empty. This unit is specifically designed to provide cryogenic liquid nitrogen to freezers. The unit is constructed of vacuum jacketed piping and the valves are specifically designed to operate and control cryogenic liquids without large ice build ups on the system.

Liquid flows to the freezer or other device are ensured by a capacitive probe that detects actual liquid in the line, unlike some models that only sense liquid or gas temperatures.

The vacuum jacketed lines prevent dripping and sweating. Combined with an included Programmable Logic Controller (PLC) this tank switcher provides improved accuracy and cryogen control.

Vacuum Jacketed Cryogenic Changeover

CHANGEOVER PANELS



Two-Tank Version Specifications	
Manifold Dimensions	28" W x 28" H 24" D (71 cm x 71 cm x 61 cm)
Control Box Dimensions	11.5" W x 13.5" H x 6" D (29.2 cm x 34.3 cm x 15 cm)
Operating Temperature	32°F-120°F (0°C-50°C)
Enclosure and Penetrations Rating	NEMA 4X, IP65
Power Requirements	110-240 VAC, 50-60 Hz
Power Usage	200 watts @ 110 VAC 1.7 amp max.
Alarm Output	24 VDC 0.2 amp max. current

Materials	
Tubing	Stainless Steel
Relief Valves	Brass
All other wetted parts	Stainless Steel

Other versions and configurations available

Design Features

- No operator intervention for cylinder switching.
- Frost-free operation. No more puddles or water running down the walls.
- Quicker cool-down time enabling faster delivery of liquid nitrogen to cryogenic freezers or other applications.
- Easy to operate touch screen controls with simple operation and adjustments.
- Eliminates system downtime during cylinder switchout.
- Allows different pressure liquid nitrogen cylinders and VGLs.

Ordering Information

Product Number	Description
Y11-TECFAB1	Stainless steel liquid changeover 2 cylinders 1 x 1

Other versions and configurations available

Optional Parts

Product Number	Description
Y15-35308	Vacuum jacket inlet hoses ½" ID hoses 295 CGA x T-65 bayonet
Y91-23208	T-65 Bayonet clamps

Other lengths available

Specialty Gases and Equipment
Product Reference Guide

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Flow Control Equipment

Introduction

Variable Area Flowmeters

Variable area flowmeters consist of a frame, tapered metering tube, and a float. They are designed to indicate rates of flow for various liquids and gases.

How They Work

Fluid enters the inlet of the metering tube exerting a force on the float. As the force overcomes the weight of the float, the float rises in the tube. When the forces of gravity, float weight, and the fluid force reach an equilibrium, the float stabilizes in the tube (see right). The position of the float at equilibrium corresponds directly to the flow rate. The flow rate is indicated on a scale etched directly onto the metering tube. This scale may be either a direct reading scale or a reference scale. A reference scale requires the use of a calibration data chart.

Variable area flowmeters must be mounted vertically with the flow moving upward through the metering section to assure accuracy. Within this restriction, they offer the flexibility of being bench-mounted or mounted directly in a pipeline, control panel, bypass system, or backup system for electronic controllers.

Selecting the Proper Flowmeter

Glass Tubes

Glass tube variable area flowmeters are economical and allow the user to see float movement. They offer the greatest variety of styles, sizes, and materials of construction and also offer tube interchangeability.

Plastic Tubes

Plastic tubes are also used in some variable area flowmeters because of their low cost and high impact strength.

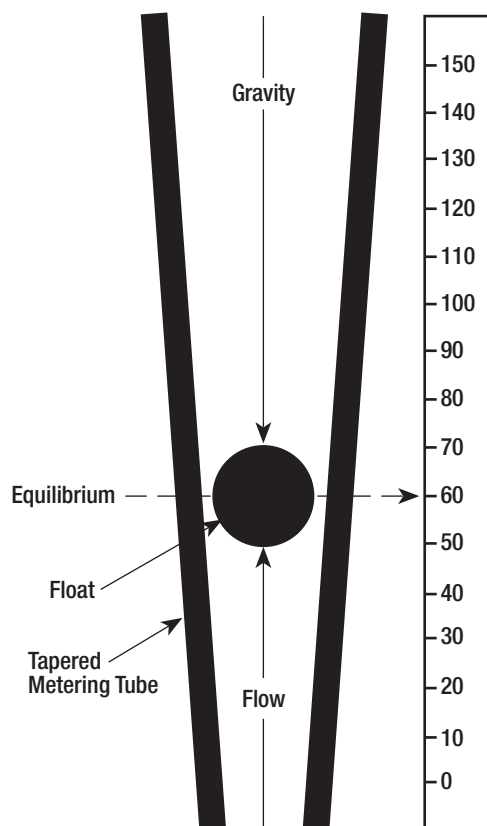
Scale Length

Scale length affects the accuracy and ease of use of the meter. A variety of scale lengths are available to satisfy a full range of

needs. These vary from 37 millimeter scales for general flow indication up to 150 millimeter scales for high accuracy requirements.

Materials of Construction

Materials of construction are an important consideration. End fitting materials are available in brass, stainless steel, and PTFE material. Brass units may be used with inert and noncorrosive media. Stainless steel and PTFE units are recommended for nontoxic, corrosive service applications.



How Flowmeters Work

Flowmeter Compatibility Chart

Gas	Flowmeter Part	Material						
		150mm/65mm			HC1100		Economy Purge	
		Brass	SS	PTFE	Brass	SS	Brass	SS
		Glass	Glass	Glass	Glass	Glass	Polycarbonate	Polycarbonate
		Buna-N®	Viton-A®	PTFE	Buna-N®	Viton-A®	Buna-N®	Viton-A®
	End Fitting							
	Tube							
	O-Rings							
	Tube Packing							
	Valve Stem							
Acetylene		S	S	S	S	S	S	S
Air		S	S	S	S	S	S	S
Ammonia		U	U	S	U	U	U	U
Argon		S	S	S	S	S	S	S
* Arsine		U	U	U	U	U	U	U
Boron Trichloride		U	U	S	U	U	U	U
Boron Trifluoride		U	S	S	U	S	U	U
Boron-11 Trifluoride		U	S	S	U	S	U	U
* Bromine Trifluoride		U	U	U	U	U	U	U
1,3-Butadiene		S	S	S	S	S	S	S
n-Butane		S	S	S	S	S	S	S
1-Butene		S	S	S	S	S	S	S
cis-2-Butene		S	S	S	S	S	S	S
trans-2-Butene		S	S	S	S	S	S	S
Carbon Dioxide		S	S	S	S	S	S	S
Carbon Monoxide		S	S	S	S	S	S	S
Chlorine		U	U	S	U	U	U	U
* Chlorine Trifluoride		U	U	U	U	U	U	U
Deuterium		S	S	S	S	S	S	S
Dichlorosilane		U	S	S	U	S	U	U
Dimethylamine		U	U	S	U	U	U	U
Disilane		S	S	U	S	S	U	U
Ethane		S	S	S	S	S	S	S
Ethyl Chloride		S	S	S	S	S	S	S
Ethylene		S	S	S	S	S	S	S
* Fluorine		U	U	U	U	U	U	U
Halocarbon-14		S	S	S	S	S	S	S
Halocarbon-23		S	S	S	S	S	U	U
Halocarbon-116		S	S	S	S	S	S	S
Helium		S	S	S	S	S	S	S
Hydrogen		S	S	S	S	S	S	S
Hydrogen Bromide		U	U	U	U	U	U	U
Hydrogen Chloride		U	U	S	U	U	U	U
* Hydrogen Fluoride		U	U	U	U	U	U	U
Hydrogen Sulfide		U	U	S	U	U	U	U
Isobutane		S	S	S	S	S	S	S
Isobutylene		S	S	S	S	S	S	S
Krypton		S	S	S	S	S	S	S
Methane		S	S	S	S	S	S	S
Methyl Chloride		U	S	S	U	S	U	U
Methyl Fluoride		S	S	S	S	S	S	S
Monomethylamine		U	U	S	U	U	U	U
Neon		S	S	S	S	S	S	S
Nitrogen		S	S	S	S	S	S	S
Nitrogen Dioxide		U	U	S	U	U	U	U
Nitrogen Trifluoride		S	S	S	S	S	U	U
Nitrous Oxide		S	S	S	S	S	S	S
Octafluorocyclobutane		S	S	S	S	S	S	S
Octafluoropropane		S	S	S	S	S	S	S
Oxygen		U	S	S	U	S	U	U
* Phosphine		U	U	U	U	U	U	U
Propane		S	S	S	S	S	S	S
Propylene		S	S	S	S	S	S	S
* Silane		U	U	U	U	U	U	U
Silicon Tetrachloride		U	U	S	U	U	U	U
* Silicon Tetrafluoride		U	U	U	U	U	U	U
Sulfur Dioxide		U	U	S	U	U	U	U
Sulfur Hexafluoride		S	S	S	S	S	S	S
* Sulfur Tetrafluoride		U	U	U	U	U	U	U
Tetrafluoromethane		S	S	S	S	S	S	S
Trimethylamine		U	U	S	U	U	U	U
* Tungsten Hexafluoride		U	U	U	U	U	U	U
Xenon		S	S	S	S	S	S	S

Key: S = Satisfactory for use with the intended gas (dry anhydrous) at normal operating temperature of 70°F.

U = Unsatisfactory for use with intended gas.

* = Due to hazardous nature of intended gas, glass tube and plastic tube meters are NOT recommended with this gas.

THE USER SHOULD BECOME THOROUGHLY FAMILIAR WITH THE PROPERTIES OF THE INTENDED GAS TO SAFELY AND EFFECTIVELY SELECT, USE AND MAINTAIN GAS HANDLING EQUIPMENT.

FLOWMETERS

Standard Valve

Description: Airgas® flowmeters feature an easy-to-read, universal millimeter scale permanently etched onto a heavy glass flow tube. This scale permits measurement of a wide range of gases and fluids under a variety of pressure and temperature conditions. Simply refer to the calibration curve to interpret the flow reading for your specific gas.

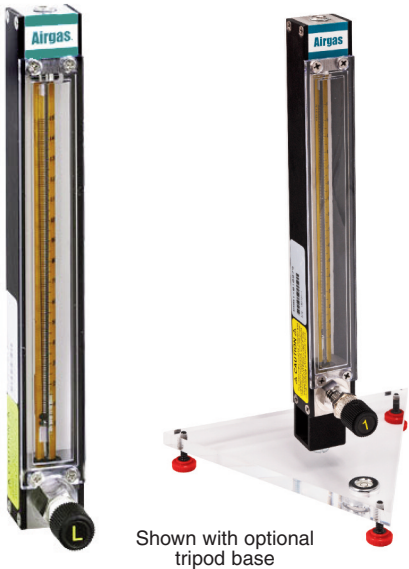
The brass and stainless steel units feature a 1.5 focal power magnifying front cover for a more accurate tube reading. Standard model features a 6-turn valve. For high-resolution (16-turn) non-rising model, see our high resolution model series.

These flowmeters contain dual floats – each constructed of a different material – providing a 20:1 readout range, versus the industry standard of 10:1.

Each flowmeter is equipped with two panel-mount retaining nuts to simplify industrial panel mounting. An optional tripod base for easy bench setup in laboratory applications is available. Pipe-to-tubing or pipe-to-hose adapters are also available.

150 mm Details: With its superior resolution, the 150 mm flow tubes are recommended for laboratory

150 mm Gas Flowmeters



applications. Accuracy is $\pm 2\%$ full scale with $\pm .25\%$ repeatability. The elongated scale permits critical flows to be gauged more accurately and read more easily. Conversion charts for air, argon, carbon dioxide, helium, hydrogen, nitrogen, and oxygen are supplied with each unit.

Available Options	
Product Number	Description
Y29-TP1	Tripod base
Y99-26190	Brass Adapter – 1/8" MNPT x 1/4" Hose Barb
Y99-26110	Brass Adapter – 1/8" MNPT x 1/4" Compression
Y99-26490	Stainless Steel Adapter – 1/8" MNPT x 1/4" Hose Barb
Y99-26410	Stainless Steel Adapter – 1/8" MNPT x 1/4" Compression

150 mm Gas Flowmeters Cont.

Standard Valve

FLOWMETERS

Ordering Information						
Product Number	Max Pressure (psig)	Inlet/Outlet	Float Material	Frame Material	Max Flow Rate *	
					ccm	scfh
Y21-B1500	200	1/8" FNPT	Glass/Stainless Steel	Brass	19/61	0.04/0.128
Y21-B1501	200	1/8" FNPT	Glass/Stainless Steel	Brass	47/138	0.098/0.293
Y21-B1501A	200	1/8" FNPT	Glass/Stainless Steel	Brass	92/264	0.195/0.559
Y21-B1502	200	1/8" FNPT	Glass/Stainless Steel	Brass	374/814	0.792/1.725
Y21-B1502A	200	1/8" FNPT	Glass/Stainless Steel	Brass	844/1682	1.748/3.564
Y21-B1503	200	1/8" FNPT	Glass/Stainless Steel	Brass	2313/4562	4.9/9.67
Y21-B1503A	200	1/8" FNPT	Glass/Stainless Steel	Brass	3922/7825	8.07/16.58
Y21-B1504	200	1/8" FNPT	Glass/Stainless Steel	Brass	8555/16493	18.12/34.94
Y21-B1505	200	1/8" FNPT	Glass/Stainless Steel	Brass	23105/42860	48.95/90.8
Y21-41500	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	19/61	0.04/0.128
Y21-41501	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	47/138	0.098/0.293
Y21-41501A	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	92/264	0.195/0.559
Y21-41502	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	374/814	0.792/1.725
Y21-41502A	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	844/1682	1.748/3.564
Y21-41503	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	2313/4562	4.9/9.67
Y21-41503A	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	3922/7825	8.07/16.58
Y21-41504	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	8555/16493	18.12/34.94
Y21-41505	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	23105/42860	48.95/90.8
Y21-T1500	100	1/8" FNPT	Glass/Stainless Steel	PTFE	19/61	0.04/0.128
Y21-T1501	100	1/8" FNPT	Glass/Stainless Steel	PTFE	47/138	0.098/0.293
Y21-T1501A	100	1/8" FNPT	Glass/Stainless Steel	PTFE	92/264	0.195/0.559
Y21-T1502	100	1/8" FNPT	Glass/Stainless Steel	PTFE	374/814	0.792/1.725
Y21-T1502A	100	1/8" FNPT	Glass/Stainless Steel	PTFE	844/1682	1.748/3.564
Y21-T1503	100	1/8" FNPT	Glass/Stainless Steel	PTFE	2313/4562	4.9/9.67
Y21-T1503A	100	1/8" FNPT	Glass/Stainless Steel	PTFE	3922/7825	8.07/16.58
Y21-T1504	100	1/8" FNPT	Glass/Stainless Steel	PTFE	8555/16493	18.12/34.94
Y21-T1505	100	1/8" FNPT	Glass/Stainless Steel	PTFE	23105/42860	48.95/90.8

* Minimum flow rate is approximately 10% of maximum figure

150 mm Gas Flowmeters Cont.

Standard Valve

FLOWMETERS

Ordering Information					
Product Number	Float Material	Max Flow Rate (Argon)		Max Flow Rate (Carbon Dioxide)	
		ccm	Air scfh	ccm	Air scfh
Y21-CA1500	Glass/Stainless Steel	15/49	0.033/0.104	23/72	0.05/0.153
Y21-CA1501	Glass/Stainless Steel	38/114	0.08/0.241	55/153	0.116/0.324
Y21-CA1501A	Glass/Stainless Steel	76/218	0.161/0.462	103/281	0.218/0.595
Y21-CA1502	Glass/Stainless Steel	305/676	0.646/1.432	355/728	0.752/1.542
Y21-CA1502A	Glass/Stainless Steel	687/1380	1.46/2.92	725/1420	1.54/3.01
Y21-CA1503	Glass/Stainless Steel	1949/3903	4.13/8.27	2048/3990	4.34/8.45
Y21-CA1503A	Glass/Stainless Steel	3151/6384	6.68/13.54	3374/6308	7.15/13.36
Y21-CA1504	Glass/Stainless Steel	7266/13977	15.39/29.61	7304/13728	15.47/29.08
Y21-CA1505	Glass/Stainless Steel	19472/36564	41.25/77.46	19220/35541	40.72/75.29
Product Number	Float Material	Max Flow Rate (Helium)		Max Flow Rate (Hydrogen)	
		ccm	Air scfh	ccm	Air scfh
Y21-CA1500	Glass/Stainless Steel	16/53	0.034/0.112	37/123	0.078/0.26
Y21-CA1501	Glass/Stainless Steel	41/136	0.087/0.288	95/304	0.201/0.319
Y21-CA1501A	Glass/Stainless Steel	90/283	0.191/0.6	208/627	0.441/1.328
Y21-CA1502	Glass/Stainless Steel	450/1290	0.953/2.733	1021/2496	2.163/5.288
Y21-CA1502A	Glass/Stainless Steel	1490/3397	3.16/7.20	2620/5547	5.55/11.75
Y21-CA1503	Glass/Stainless Steel	4880/9770	10.34/20.70	7817/15855	16.56/33.59
Y21-CA1503A	Glass/Stainless Steel	7803/15960	16.53/33.82	13105/27804	27.76/58.91
Y21-CA1504	Glass/Stainless Steel	19040/39280	40.33/83.22	29795/58968	63.12/124.9
Y21-CA1505	Glass/Stainless Steel	53552/106151	113/224.8	83730/157719	177.3/334.1
Product Number	Float Material	Max Flow Rate (Nitrogen)		Max Flow Rate (Oxygen)	
		ccm	Air scfh	ccm	Air scfh
Y21-CA1500	Glass/Stainless Steel	20/62	0.041/0.132	17/54	0.036/0.115
Y21-CA1501	Glass/Stainless Steel	48/142	0.101/0.3	42/125	0.088/0.264
Y21-CA1501A	Glass/Stainless Steel	92/271	0.195/0.574	81/233	0.172/0.494
Y21-CA1502	Glass/Stainless Steel	382/824	0.809/1.746	340/753	0.72/1.595
Y21-CA1502A	Glass/Stainless Steel	827/1662	1.75/3.52	772/1545	1.64/3.27
Y21-CA1503	Glass/Stainless Steel	2395/4685	5.07/9.93	2169/4341	4.6/9.2
Y21-CA1503A	Glass/Stainless Steel	3868/7722	8.19/16.36	3485/6992	7.38/14.81
Y21-CA1504	Glass/Stainless Steel	8695/16794	18.42/35.58	8091/15610	17.14/33.07
Y21-CA1505	Glass/Stainless Steel	23432/43607	49.64/92.38	21832/41076	46.25/87.02

150 mm High Resolution Gas Flowmeters

Description: Our high-resolution flowmeters permit measurement of a wide range of gases and fluids under a variety of pressure and temperature conditions. Simply refer to the calibration curve to interpret the flow reading for your specific gas.

The brass and stainless steel units feature a 1.5 focal power magnifying front cover for more accurate tube reading. High-resolution models feature 16-turn valve for precise control. Choose our standard-valve flowmeter when precise control is not required (see our standard resolution models).

These flowmeters contain dual floats – each constructed of a different material – which provide a 20:1 readout range, versus the industry standard of 10:1.

Each flowmeter is equipped with two panel-mount retaining nuts to simplify industrial panel mounting. An optional tripod base is available for easy bench setup in laboratory applications. Pipe-to-tubing or pipe-to-hose adapters are also available.

150 mm Details: Because of its superior resolution, the 150 mm flow tubes are recommended for laboratory applications. Accuracy is $\pm 2\%$ full scale with $\pm .25\%$ repeatability. The elongated scale permits critical flows to be gauged more accurately and read more easily.

High-Resolution Valve

FLOWMETERS



Conversion charts for air, argon, carbon dioxide, helium, hydrogen, nitrogen, and oxygen are supplied with each unit.

Equipment

Available Options	
Product Number	Description
Y29-TP1	Tripod base
Y99-26190	Brass Adapter – 1/8" MNPT x 1/4" Hose Barb
Y99-26110	Brass Adapter – 1/8" MNPT x 1/4" Compression
Y99-26490	Stainless Steel Adapter – 1/8" MNPT x 1/4" Hose Barb
Y99-26410	Stainless Steel Adapter – 1/8" MNPT x 1/4" Compression

150 mm High Resolution Gas Flowmeters Cont.

SIR™

MANIFOLDS

Ordering Information						
Product Number	Max Pressure (psig)	Inlet/Outlet	Float Material	Frame Material	Max Flow Rate *	
					ccm	scfh
Y21-B1500HA	200	1/8" FNPT	Glass/Stainless Steel	Brass	19/61	0.04/0.128
Y21-B1501HA	200	1/8" FNPT	Glass/Stainless Steel	Brass	47/138	0.098/0.293
Y21-B1501AHA	200	1/8" FNPT	Glass/Stainless Steel	Brass	92/264	0.195/0.559
Y21-B1502HA	200	1/8" FNPT	Glass/Stainless Steel	Brass	374/814	0.792/1.725
Y21-B1502AHA	200	1/8" FNPT	Glass/Stainless Steel	Brass	844/1682	1.748/3.564
Y21-B1503HA	200	1/8" FNPT	Glass/Stainless Steel	Brass	2313/4562	4.9/9.67
Y21-B1503AHA	200	1/8" FNPT	Glass/Stainless Steel	Brass	3922/7825	8.07/16.58
Y21-B1504HA	200	1/8" FNPT	Glass/Stainless Steel	Brass	8555/16493	18.12/34.94
Y21-B1505HA	200	1/8" FNPT	Glass/Stainless Steel	Brass	23105/42860	48.95/90.8
Y21-41500HA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	19/61	0.04/0.128
Y21-41501HA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	47/138	0.098/0.293
Y21-41501AHA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	92/264	0.195/0.559
Y21-41502HA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	374/814	0.792/1.725
Y21-41502AHA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	844/1682	1.748/3.564
Y21-41503HA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	2313/4562	4.9/9.67
Y21-41503AHA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	3922/7825	8.07/16.58
Y21-41504HA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	8555/16493	18.12/34.94
Y21-41505HA	200	1/8" FNPT	Glass/Stainless Steel	Stainless Steel	23105/42860	48.95/90.8

* Minimum flow rate is approximately 10% of maximum figure

FLOW METERS

Economy



Acrylic Flow Meters

Description: Ideal for non-critical applications, the economy purge meter is widely accepted as a practical, inexpensive approach to regulating low flows of non-corrosive gases. Each meter's tube has a direct reading for the desired gas.

These purge meters are available with and without a control valve.

Design Features

- Easy to read English and metric scales
- Purge meters are offered with or without built-in needle valves
- Easy disassembly and assembly for cleaning

Specifications

Maximum Pressure	100 psig
Maximum Temperature	65C
Accuracy	+/- 5%
Inlet/Outlet Connections	1/8" NPT female

Materials

Meter Blocks	Acrylic
Float Materials	Black Glass, Stainless Steel; Carboly
O-ring Seals	Viton with Stainless Steel; Buna-N with brass
Fittings	Brass or Stainless Steel

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range	
				Air @ 14.7 psig and 70F LPM	SCFH
Y20-A37MM12A	No	Brass	Glass	1.4	2.8
Y20-A37MM12VA	Yes	Brass	Glass	1.4	2.8
Y20-A37MM13A	No	Brass	Stainless Steel	2.75	5.5
Y20-A37MM13VA	Yes	Brass	Stainless Steel	2.75	5.5
Y20-A37MM14A	No	Brass	Carboly	3.5	7.0
Y20-A37MM14VA	Yes	Brass	Carboly	3.5	7.0
Y20-A37MM15A	No	Brass	Glass	8.5	18.0
Y20-A37MM15VA	Yes	Brass	Glass	8.5	18.0
Y20-A37MM16A	No	Brass	Stainless Steel	16.0	32.5
Y20-A37MM16VA	Yes	Brass	Stainless Steel	16.0	32.5
Y20-A37MM17A	No	Brass	Carboly	22.0	45.0
Y20-A37MM17VA	Yes	Brass	Carboly	22.0	45.0
Y20-A37MM18A	No	Brass	Stainless Steel	50.0	100.0
Y20-A37MM18VA	Yes	Brass	Stainless Steel	50.0	100.0
Y20-A37MM42A	No	Stainless Steel	Glass	1.4	2.8
Y20-A37MM42VA	Yes	Stainless Steel	Glass	1.4	2.8
Y20-A37MM43A	No	Stainless Steel	Stainless Steel	2.75	5.5
Y20-A37MM43VA	Yes	Stainless Steel	Stainless Steel	2.75	5.5
Y20-A37MM44A	No	Stainless Steel	Carboly	3.5	7.0
Y20-A37MM44VA	Yes	Stainless Steel	Carboly	3.5	7.0
Y20-A37MM45A	No	Stainless Steel	Glass	8.5	18.0
Y20-A37MM45VA	Yes	Stainless Steel	Glass	8.5	18.0
Y20-A37MM46A	No	Stainless Steel	Stainless Steel	16.0	32.5

FLOW METERS

Economy

Acrylic Flow Meters Cont.

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range	
				Air @ 14.7 psig and 70F LPM	SCFH
Y20-A37MM46VA	Yes	Stainless Steel	Stainless Steel	16.0	32.5
Y20-A37MM47A	No	Stainless Steel	Carbology	22.0	45.0
Y20-A37MM47VA	Yes	Stainless Steel	Carbology	22.0	45.0
Y20-A37MM48A	No	Stainless Steel	Stainless Steel	50.0	100.0
Y20-A37MM48VA	Yes	Stainless Steel	Stainless Steel	50.0	100.0

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range	
				Nitrogen @ 14.7 psig and 70F LPM	SCFH
Y20-A37MM12N2	No	Brass	Glass	1.3	2.75
Y20-A37MM12VN2	Yes	Brass	Glass	1.3	2.75
Y20-A37MM13N2	No	Brass	Stainless Steel	2.75	5.5
Y20-A37MM13VN2	Yes	Brass	Stainless Steel	2.75	5.5
Y20-A37MM14N2	No	Brass	Carbology	3.5	7.5
Y20-A37MM14VN2	Yes	Brass	Carbology	3.5	7.5
Y20-A37MM15N2	No	Brass	Glass	8.0	16.0
Y20-A37MM15VN2	Yes	Brass	Glass	8.0	16.0
Y20-A37MM16N2	No	Brass	Stainless Steel	16.0	32.5
Y20-A37MM16VN2	Yes	Brass	Stainless Steel	16.0	32.5
Y20-A37MM17N2	No	Brass	Carbology	22.0	45.0
Y20-A37MM17VN2	Yes	Brass	Carbology	22.0	45.0
Y20-A37MM18N2	No	Brass	Stainless Steel	45.0	100.0
Y20-A37MM18VN2	Yes	Brass	Stainless Steel	45.0	100.0
Y20-A37MM42N2	No	Stainless Steel	Glass	1.3	2.75
Y20-A37MM42VN2	Yes	Stainless Steel	Glass	1.3	2.75
Y20-A37MM43N2	No	Stainless Steel	Stainless Steel	2.75	5.5
Y20-A37MM43VN2	Yes	Stainless Steel	Stainless Steel	2.75	5.5
Y20-A37MM44N2	No	Stainless Steel	Carbology	3.5	7.5
Y20-A37MM44VN2	Yes	Stainless Steel	Carbology	3.5	7.5
Y20-A37MM45N2	No	Stainless Steel	Glass	8.0	16.0
Y20-A37MM45VN2	Yes	Stainless Steel	Glass	8.0	16.0
Y20-A37MM46N2	No	Stainless Steel	Stainless Steel	16.0	32.5
Y20-A37MM46VN2	Yes	Stainless Steel	Stainless Steel	16.0	32.5
Y20-A37MM47N2	No	Stainless Steel	Carbology	22.0	45.0
Y20-A37MM47VN2	Yes	Stainless Steel	Carbology	22.0	45.0
Y20-A37MM48N2	No	Stainless Steel	Stainless Steel	45.0	100.0
Y20-A37MM48VN2	Yes	Stainless Steel	Stainless Steel	45.0	100.0

FLOW METERS

Economy

Acrylic Flow Meters Cont.

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range Oxygen @ 14.7 psig and 70F	
				LPM	SCFH
Y20-A37MM12O2	No	Brass	Glass	1.2	2.5
Y20-A37MM12VO2	Yes	Brass	Glass	1.2	2.5
Y20-A37MM13O2	No	Brass	Stainless Steel	2.5	5.0
Y20-A37MM13VO2	Yes	Brass	Stainless Steel	2.5	5.0
Y20-A37MM14O2	No	Brass	Carboloy	3.5	7.0
Y20-A37MM14VO2	Yes	Brass	Carboloy	3.5	7.0
Y20-A37MM15O2	No	Brass	Glass	8.0	16.0
Y20-A37MM15VO2	Yes	Brass	Glass	8.0	16.0
Y20-A37MM16O2	No	Brass	Stainless Steel	15.0	30.0
Y20-A37MM16VO2	Yes	Brass	Stainless Steel	15.0	30.0
Y20-A37MM17O2	No	Brass	Carboloy	20.0	42.5
Y20-A37MM17VO2	Yes	Brass	Carboloy	20.0	42.5
Y20-A37MM18O2	No	Brass	Stainless Steel	45.0	90.0
Y20-A37MM18VO2	Yes	Brass	Stainless Steel	45.0	90.0
Y20-A37MM42O2	No	Stainless Steel	Glass	1.2	2.5
Y20-A37MM42VO2	Yes	Stainless Steel	Glass	1.2	2.5
Y20-A37MM43O2	No	Stainless Steel	Stainless Steel	2.5	5.0
Y20-A37MM43VO2	Yes	Stainless Steel	Stainless Steel	2.5	5.0
Y20-A37MM44O2	No	Stainless Steel	Carboloy	3.5	7.0
Y20-A37MM44VO2	Yes	Stainless Steel	Carboloy	3.5	7.0
Y20-A37MM45O2	No	Stainless Steel	Glass	8.0	16.0
Y20-A37MM45VO2	Yes	Stainless Steel	Glass	8.0	16.0
Y20-A37MM46O2	No	Stainless Steel	Stainless Steel	15.0	30.0
Y20-A37MM46VO2	Yes	Stainless Steel	Stainless Steel	15.0	30.0
Y20-A37MM47O2	No	Stainless Steel	Carboloy	20.0	42.5
Y20-A37MM47VO2	Yes	Stainless Steel	Carboloy	20.0	42.5
Y20-A37MM48O2	No	Stainless Steel	Stainless Steel	45.0	90.0
Y20-A37MM48VO2	Yes	Stainless Steel	Stainless Steel	45.0	90.0

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range Carbon Dioxide @ 14.7 psig and 70F	
				LPM	SCFH
Y20-A37MM12CO2	No	Brass	Glass	1.1	2.1
Y20-A37MM12VCO2	Yes	Brass	Glass	1.1	2.1
Y20-A37MM13CO2	No	Brass	Stainless Steel	2.0	5.0
Y20-A37MM13VCO2	Yes	Brass	Stainless Steel	2.0	5.0
Y20-A37MM14CO2	No	Brass	Carboloy	3.0	6.5
Y20-A37MM14VCO2	Yes	Brass	Carboloy	3.0	6.5
Y20-A37MM15CO2	No	Brass	Glass	7.0	15.0
Y20-A37MM15VCO2	Yes	Brass	Glass	7.0	15.0
Y20-A37MM16CO2	No	Brass	Stainless Steel	12.0	25.0
Y20-A37MM16VCO2	Yes	Brass	Stainless Steel	12.0	25.0
Y20-A37MM17CO2	No	Brass	Carboloy	18.0	37.5
Y20-A37MM17VCO2	Yes	Brass	Carboloy	18.0	37.5
Y20-A37MM18CO2	No	Brass	Stainless Steel	35.0	80.0
Y20-A37MM18VCO2	Yes	Brass	Stainless Steel	35.0	80.0
Y20-A37MM42CO2	No	Stainless Steel	Glass	1.1	2.1

FLOW METERS

Economy

Acrylic Flow Meters Cont.

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range Carbon Dioxide @ 14.7 psig and 70F	
				LPM	SCFH
Y20-A37MM42VCO2	Yes	Stainless Steel	Glass	1.1	2.1
Y20-A37MM43CO2	No	Stainless Steel	Stainless Steel	2.0	5.0
Y20-A37MM43VCO2	Yes	Stainless Steel	Stainless Steel	2.0	5.0
Y20-A37MM44CO2	No	Stainless Steel	Carbology	3.0	6.5
Y20-A37MM44VCO2	Yes	Stainless Steel	Carbology	3.0	6.5
Y20-A37MM45CO2	No	Stainless Steel	Glass	7.0	15.0
Y20-A37MM45VCO2	Yes	Stainless Steel	Glass	7.0	15.0
Y20-A37MM46CO2	No	Stainless Steel	Stainless Steel	12.0	25.0
Y20-A37MM46VCO2	Yes	Stainless Steel	Stainless Steel	12.0	25.0
Y20-A37MM47CO2	No	Stainless Steel	Carbology	18.0	37.5
Y20-A37MM47VCO2	Yes	Stainless Steel	Carbology	18.0	37.5
Y20-A37MM48CO2	No	Stainless Steel	Stainless Steel	35.0	80.0
Y20-A37MM48VCO2	Yes	Stainless Steel	Stainless Steel	35.0	80.0

Ordering Information

Product Number	Valve	Material	Float Material	Flow Range Argon @ 14.7 psig and 70F	
				LPM	SCFH
Y20-A37MM12AR	No	Brass	Glass	1.1	2.25
Y20-A37MM12VAR	Yes	Brass	Glass	1.1	2.25
Y20-A37MM13AR	No	Brass	Stainless Steel	2.2	5.0
Y20-A37MM13VAR	Yes	Brass	Stainless Steel	2.2	5.0
Y20-A37MM14AR	No	Brass	Carbology	3.0	6.5
Y20-A37MM14VAR	Yes	Brass	Carbology	3.0	6.5
Y20-A37MM15AR	No	Brass	Glass	7.0	15.0
Y20-A37MM15VAR	Yes	Brass	Glass	7.0	15.0
Y20-A37MM16AR	No	Brass	Stainless Steel	13.0	26.0
Y20-A37MM16VAR	Yes	Brass	Stainless Steel	13.0	26.0
Y20-A37MM17AR	No	Brass	Carbology	18.0	37.5
Y20-A37MM17VAR	Yes	Brass	Carbology	18.0	37.5
Y20-A37MM18AR	No	Brass	Stainless Steel	40.0	80.0
Y20-A37MM18VAR	Yes	Brass	Stainless Steel	40.0	80.0
Y20-A37MM42AR	No	Stainless Steel	Glass	1.1	2.25
Y20-A37MM42VAR	Yes	Stainless Steel	Glass	1.1	2.25
Y20-A37MM43AR	No	Stainless Steel	Stainless Steel	2.2	5.0
Y20-A37MM43VAR	Yes	Stainless Steel	Stainless Steel	2.2	5.0
Y20-A37MM44AR	No	Stainless Steel	Carbology	3.0	6.5
Y20-A37MM44VAR	Yes	Stainless Steel	Carbology	3.0	6.5
Y20-A37MM45AR	No	Stainless Steel	Glass	7.0	15.0
Y20-A37MM45VAR	Yes	Stainless Steel	Glass	7.0	15.0
Y20-A37MM46AR	No	Stainless Steel	Stainless Steel	13.0	26.0
Y20-A37MM46VAR	Yes	Stainless Steel	Stainless Steel	13.0	26.0
Y20-A37MM47AR	No	Stainless Steel	Carbology	18.0	37.5
Y20-A37MM47VAR	Yes	Stainless Steel	Carbology	18.0	37.5
Y20-A37MM48AR	No	Stainless Steel	Stainless Steel	40.0	80.0
Y20-A37MM48VAR	Yes	Stainless Steel	Stainless Steel	40.0	80.0

FLOW METERS

Economy

Acrylic Flow Meters Cont.

Ordering Information

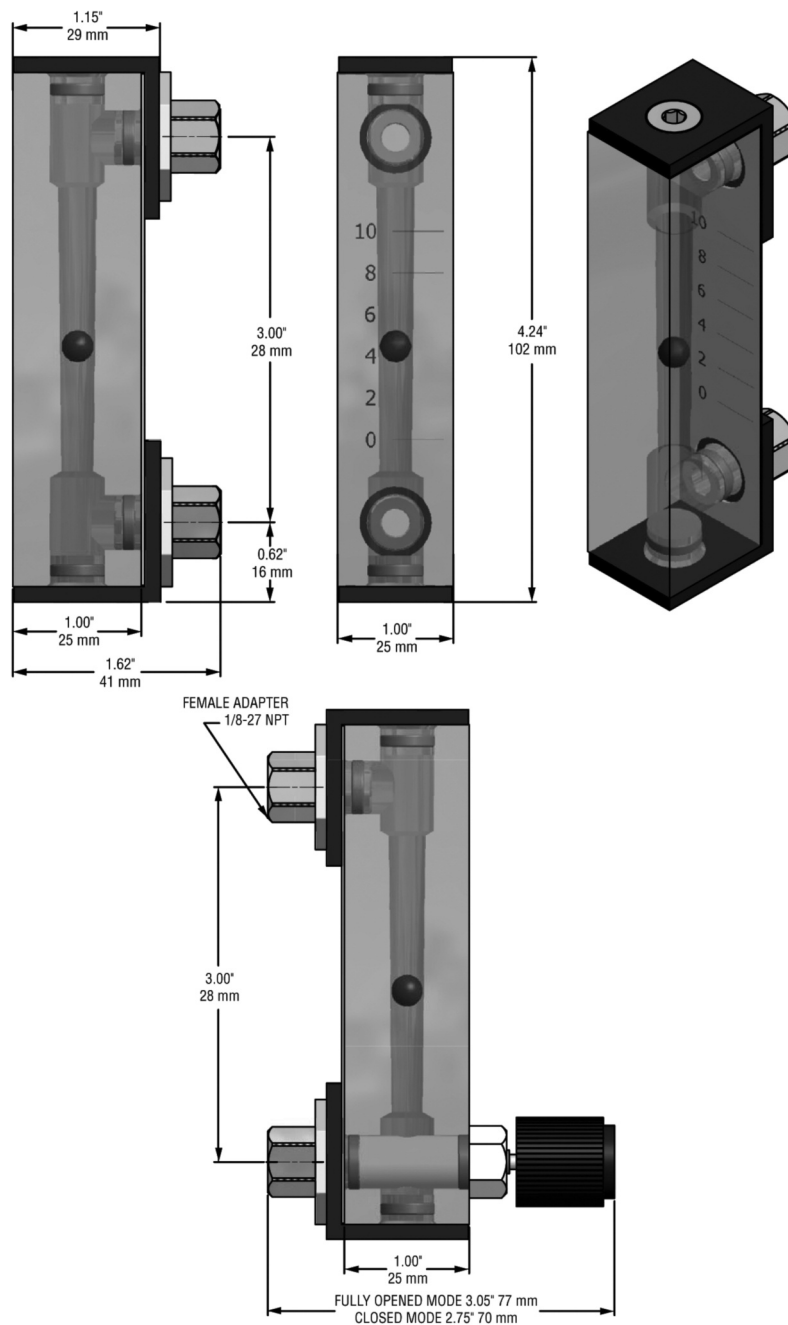
Product Number	Valve	Material	Float Material	Flow Range @ 14.7 psig and 70F	
				Helium LPM	SCFH
Y20-A37MM12HE	No	Brass	Glass	2.0	4.0
Y20-A37MM12VHE	Yes	Brass	Glass	2.0	4.0
Y20-A37MM13HE	No	Brass	Stainless Steel	5.5	11.0
Y20-A37MM13VHE	Yes	Brass	Stainless Steel	5.5	11.0
Y20-A37MM14HE	No	Brass	Carboloy	8.0	17.0
Y20-A37MM14VHE	Yes	Brass	Carboloy	8.0	17.0
Y20-A37MM15HE	No	Brass	Glass	18.0	40.0
Y20-A37MM15VHE	Yes	Brass	Glass	18.0	40.0
Y20-A37MM16HE	No	Brass	Stainless Steel	35.0	70.0
Y20-A37MM16VHE	Yes	Brass	Stainless Steel	35.0	70.0
Y20-A37MM17HE	No	Brass	Carboloy	55.0	110.0
Y20-A37MM17VHE	Yes	Brass	Carboloy	55.0	110.0
Y20-A37MM18HE	No	Brass	Stainless Steel	110.0	250.0
Y20-A37MM18VHE	Yes	Brass	Stainless Steel	110.0	250.0
Y20-A37MM42HE	No	Stainless Steel	Glass	2.0	4.0
Y20-A37MM42VHE	Yes	Stainless Steel	Glass	2.0	4.0
Y20-A37MM43HE	No	Stainless Steel	Stainless Steel	5.5	11.0
Y20-A37MM43VHE	Yes	Stainless Steel	Stainless Steel	5.5	11.0
Y20-A37MM44HE	No	Stainless Steel	Carboloy	8.0	17.0
Y20-A37MM44VHE	Yes	Stainless Steel	Carboloy	8.0	17.0
Y20-A37MM45HE	No	Stainless Steel	Glass	18.0	40.0
Y20-A37MM45VHE	Yes	Stainless Steel	Glass	18.0	40.0
Y20-A37MM46HE	No	Stainless Steel	Stainless Steel	35.0	70.0
Y20-A37MM46VHE	Yes	Stainless Steel	Stainless Steel	35.0	70.0
Y20-A37MM47HE	No	Stainless Steel	Carboloy	55.0	110.0
Y20-A37MM47VHE	Yes	Stainless Steel	Carboloy	55.0	110.0
Y20-A37MM48HE	No	Stainless Steel	Stainless Steel	110.0	250.0
Y20-A37MM48VHE	Yes	Stainless Steel	Stainless Steel	110.0	250.0

FLOW METERS

Economy

Acrylic Flow Meters Cont.

Dimensions



FLOWMETERS

Standard Valve

65 mm Gas Flowmeters

Description: Airgas® flowmeters feature a direct reading scale, permanently etched onto a heavy glass flow tube.

The brass and stainless steel units feature a 1.5 focal power magnifying front cover that allows for more accurate tube reading.

Each flowmeter is equipped with two panel-mount retaining nuts to simplify industrial panel mounting, or you may purchase an optional tripod base for easy bench setup in laboratory applications. Pipe-to-tubing or pipe-to-hose adapters are also available.

65 mm Details: Preferred for industrial panel mounting, the 65 mm flowmeter tube is recommended for monitoring and control of flow from a central control panel in the facility. These models also serve as an excellent backup for electronic flow systems.



The 65 mm flow tube has a direct-reading scale air etched directly onto the tube. Accuracy is $\pm 5\%$ full scale with $\pm .25\%$ repeatability.

Ordering Information

Product Number	Max Pressure (psig)	Inlet/Outlet	Float Material	Frame Material	Max Flow Rate *	
					ccm	scfh
Y21-B651	200	1/8" FNPT	Glass	Brass	100	0.21
Y21-B652	200	1/8" FNPT	Glass	Brass	1,000	2.2
Y21-B653	200	1/8" FNPT	Glass	Brass	2,832	6.0
Y21-B654	200	1/8" FNPT	Stainless Steel	Brass	9,440	20
Y21-B655	200	1/8" FNPT	Carboloy®	Brass	70,800	150
Y21-4651	200	1/8" FNPT	Glass	316 SS	130	0.28
Y21-4652	200	1/8" FNPT	Glass	316 SS	1,000	2.2
Y21-4653	200	1/8" FNPT	Glass	316 SS	2,832	6.0
Y21-4654	200	1/8" FNPT	Stainless Steel	316 SS	9,440	20
Y21-4655	200	1/8" FNPT	Carboloy®	316 SS	70,800	150
Y21-T651	100	1/8" FNPT	Glass	PTFE®	100	0.21
Y21-T652	100	1/8" FNPT	Glass	PTFE®	1,000	2.2
Y21-T653	100	1/8" FNPT	Glass	PTFE®	2,832	6.0
Y21-T654	100	1/8" FNPT	Stainless Steel	PTFE®	9,440	20
Y21-T655	100	1/8" FNPT	Carboloy®	PTFE®	70,800	150

* Minimum flow rate is approximately 10% of maximum figure.
Bold type depicts actual scale reading.

Available Options

Product Number	Description
Y29-TP1	Tripod base (Brass and SS models)
Y99-26190	Brass Adapter – 1/8" MNPT x 1/4" Hose
Y99-26110	Brass Adapter – 1/8" MNPT x 1/4" Compression
Y99-26490	Stainless Steel Adapter – 1/8" MNPT x 1/4" Hose
Y99-26410	Stainless Steel Adapter – 1/8" MNPT x 1/4" Compression

HC-1100 High-Capacity Meter

High Capacity

FLOWMETERS

Description: The HC-1100 Series flowmeters offer measuring indication of gases at higher flow levels than our other flowmeters. These meters are designed to withstand demanding industrial applications and are also suitable for laboratory use.

Design Features

Ribbed Tubes

stabilize the float and improve accuracy and readability.

Large Diameter Flow Tubes

permit flows up to 30 standard cubic feet per minute (scfm) of air.

Available in Stainless Steel

allows use in corrosive gas service.

Borosilicate Glass Tubes

permit operation up to temperatures of 250°F



Specifications

Maximum Operating Pressure	150 psig
Ambient Operating Temperature	0° F to +250° F
Scale Length	127 mm
Accuracy	±5% of full scale
Repeatability	±0.5%
Connections	3/8" FNPT

Materials

Tubes	Borosilicate glass
Floats	316 Stainless Steel
Meter Case	Aluminum
End Blocks	Brass or 316 Stainless Steel
Seals	
Brass Units	Buna-N
Stainless Steel Units	Viton

Ordering Information

Brass	Product Number	Stainless Steel	Flow Range	
			(scfm)	(lpm)
			Air @ 14.7 psig and 70°F	
Y21-BHC1		Y21-4HC1	0.5–5.0*	10–140
Y21-BHC2		Y21-4HC2	1.0–10	20–280
Y21-BHC3		Y21-4HC3	1.0–15	20–425
Y21-BHC4		Y21-4HC4	1.0–20	50–575
Y21-BHC5		Y21-4HC5	2.0–30	80–900

*Note: Bold type depicts actual scale reading.

150 mm Gas Proportioner

Proportioner/Multitube

FLOWMETERS

Description: Airgas® gas proportioners are designed for blending bases in an exact ratio. The gases are piped into individual connections and, after passing through the tubes, are mixed in a chamber and exhausted from the unit through a single port.

NOTE: Gas proportioner and two tubes are supplied as one unit. To select tubes, see 150 mm flowmeter section.

Specifications	
Metering Tubes	Borosilicate glass
Floats	316 stainless steel and glass
End Fittings	Brass units—brass
	Stainless steel units—316 stainless steel
O-Rings	Brass units—Buna-N
	Stainless steel units—Viton-A



Ordering Information				
Brass	Product Number	Stainless Steel	Valve	End Fittings
Y22-150MM11		Y22-150MM41	Standard	1/8" FNPT
Y22-B150HA		Y22-4150HA	High Resolution	1/8" FNPT

Available Options	
Product Number	Description
Y29-TP2	Tripod Base

For pipe-to-tube adaptors see tube/pipe fitting section.

FLOWMETERS

Proportioner/Multitube



Multiple-Tube Flowmeter Units

Description: Multiple-tube flowmeter units permit the separate measurement of different flows in a single housing. Three- and four-tube units are listed here. Units housing up to six tubes are available upon request.

NOTE: Flowmeter tubes are supplied as one unit. To select tubes, see 150 mm flowmeter section.

Specifications	
Metering Tubes	Borosilicate glass
Floats	316 stainless steel and glass
End Fittings	Brass units—brass
	Stainless steel units—316 stainless steel
O-Rings	Brass units—Buna-N
	Stainless steel units—Viton-A

Ordering Information

3-Tube Brass	Product Number 4-Tube Brass	4-Tube Stainless Steel	Valve	End Fittings
Y23-150MM11	Y24-150MM11	Y24-150MM41	Standard	1/8" FNPT
Y23-B150HA	Y24-B150HA	Y24-4150HA	High Resolution	1/8" FNPT

Available Options

Product Number	Description
Y29-TP3	Tripod Base for 3-tube meter
Y29-TP4	Tripod Base for 4-tube meter

For pipe-to-tube adaptors see tube/pipe fitting section.

Model 964, Mass Flowmeter

Mass Flow Controllers

FLOWMETERS

Description: The Airgas® Model 964 mass flowmeter is a convenient, economical closed loop control system for metering gas flowrates. The unit is designed with an optimal 90 degree tilted LCD readout. The readout is also readily removable for remote reading installations, a feature especially useful in instrument panel designs.

The Model 964 is available in aluminum or stainless steel. LCD readouts are provided in direct reading units (standard) or in 0-100% displays. Calibration adjustment is conveniently accessible from the outside of the meter.

A 110v/12vdc power supply is provided.



Specifications	
Accuracy	±1.5% of full scale, including linearity for gas temperatures of 59° F to 77° F and pressures of 5 to 60 psia.
Repeatability	±0.5% of full scale
Response Time	Generally 2 seconds to within ±2% of actual flow rate over 25 to 100% of full scale
Gas Pressures	Glass filled nylon 150 psig SS 1000 psig up to 15 SLPM SS 500 psig over 15 SLPM 500 psig maximum (20 psig optimum)
Gas & Ambient Temperature	32 to 120° F
Wetted Parts	Aluminum models: anodized aluminum, 316 SS, brass and Viton® O-rings SS models: 316 SS and Viton® O-rings
Connections	¼" NPT female
Input Power	+12 Vdc; 200 mA maximum (provided)
Output Signal	Linear 0-5 Vdc. (1000 Ω min. load impedance) or 4 - 20 mA (50 - 250 Ω loop resistance)
Tilttable Display	3½ digit LCD, 0.5 inch high characters

Please Call 1-800-939-5711 For Ordering Information

Model	Maximum Flow	Body Type	Options
	1 - 0-10 ml/min.	S. Stainless Steel	With LCD
	2 - 0-20 ml/min.	A. 10% glass filled nylon	Without LCD
	3 - 0-50 ml/min.		Neoprene® O-Rings
	4 - 0-100 ml/min.		Kalrez® O-Rings
	5 - 0-200 ml/min.		VRC® Compression Fitting
	6 - 0-500 ml/min.		½" Compression Fitting
	7 - 0-1 L/min.		¾" Compression Fitting
	8 - 0-2 L/min.		0-5 VDC output
	9 - 0-5 L/min.		4-20 MA output
	10 - 0-10 L/min.		Cable with 9-pin O-connector, (4-20 mA)
	11 - 0-20 L/min.		Cable with 9-pin O-connector, (0-5 Vdc)
	12 - 0-30 L/min.		Remote cable, 3 ft. long
	13 - 0-40 L/min.		Remove LDC readout with 3 ft. long cable

Ordering 964-1-S-With LCD

Example: 964 Mass Flowmeter with 0-10 ml/min. range; Stainless steel body; LCD option selected. Specify gas and operating parameters for calibration.

Model 965, Mass Flow Controller

Mass Flow Controller

FLOWMETERS

Description: The model 965 is designed to control the flow of non-corrosive gases. The instruments built-in display and set-point control eliminate the need for separate power supply and readout electronics, standard on most mass flow controllers. A straight, large diameter sensor tube prevents clogging and contamination. The fast response valve provides precise one-step control of critical gas flows. You simply, set it and forget it.

Available in flow ranges from 0–10 sccm to 0–50 slpm. The standard unit accepts 0–5 VDC or 4–20 mA command signals for applications that require remote set point control.



Specifications	
Accuracy	±1.5% of full scale
Repeatability	±0.25% of full scale
Response Time	1 second
Gas Pressures	150 psig maximum (25 psig optimum)
Gas & Ambient Temperature	32 to 120° F
Wetted Parts	Viton® O-rings
Connections	¼" or ⅜" compression fittings ¼" NPT female
Input Power	+12 Vdc; 200 mA maximum (provided) (+24 Vdc optional)
Output Signal	Linear 0–5 Vdc. (1000 Ω min. load impedance) or 4 - 20 mA (50 - 500 Ω loop resistance) maximum noise ±20 mV
Tilttable Display	3½ digit LCD, 0.5 inch high characters

Please Call 1-800-939-5711 For Ordering Information*

Series 965	Maximum Flow	Body Type	Options
	1 - 0-10 ml/min.	A. Glass-filled nylon	With LCD
	2 - 0-20 ml/min.	S. 316 Stainless Steel	Without LCD
	3 - 0-50 ml/min.		VRC® Compression Fitting
	4 - 0-100 ml/min.		⅜" Compression Fitting
	5 - 0-200 ml/min.		⅝" Compression Fitting
	6 - 0-500 ml/min.		
	7 - 0-1 L/min.		
	8 - 0-2 L/min.		
	9 - 0-5 L/min.		
	10 - 0-10 L/min.		
	11 - 0-20 L/min.		
	12 - 0-50 L/min.		

Ordering 965-1-S-With LCD

Example: 965 Mass Flow Controller; 0-10 ml/min. Maximum Flow; Stainless Steel Body; LCD option selected.

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Purifiers Nano/Semiconductor

Engineering the Right Solutions



Airgas WeldPur Series Gas Welding Purifiers

Airgas WeldPur gas purifiers are designed to provide the high-quality purified purge and shielding gases for use in high-purity welding applications. These purifiers are ideal for semiconductor, LED, pharmaceutical, and medical applications requiring the highest levels of gas purity in welding processes. Bad welds caused by impure gases compromise the overall cleanliness of the process, effecting product yield.

Constructed using 316L electro-polished stainless steel with standard 0.1µm filtration, Airgas WeldPur purifiers deliver an ultra-high purity grade of gas by removing moisture, oxygen, and hydrocarbons to sub ppb levels.

Specifications	
Gases for purification	Argon, Helium, Neon, Krypton, Xeon and Nitrogen
Outlet purity	Impurities removed to <1ppb CO, CO ₂ , H ₂ , H ₂ O, O ₂ and NMHC
Flows	Accommodate flows up to 150 slpm (max)
Maximum operating pressure	250 psig
Inlet/Outlet Connections	¼" MVCR
Internal Surface Finish	Less than 10 ra
Life	Factory regenerable for up to 10 year life

Welding Purge Gas Purifiers

GAS PURIFIER



Design Features

- Enhances weld quality, strength and appearance
- Reduces weld porosity and oxidation
- Factory Regeneration for lower cost of ownership
- Ambient Temperature Operation
- 316L Stainless Steel construction for ultimate outlet purity
- Available with inlet isolation valve for easy installation
- Suitable for single or multiple weld heads
- Suitable for use with weld gas mixtures (Consult your local Airgas sales office)
- Leak checked 2x10⁻⁹ atm cc/sec
- Shipped Activated ready for use
- Available options mounting plate, manual isolation and bypass valves

Ordering Information

Product Number	Flows (150 psig)	Inlet/Outlet Connections
Y40-01KC (*Gas)	Nominal: 10 slpm Max: 150 slpm	¼" MVCR
Y40-975C (*Gas)**		¼" MVCR

(*) designates gas

Ar = Argon

He = Helium

N₂ = Nitrogen

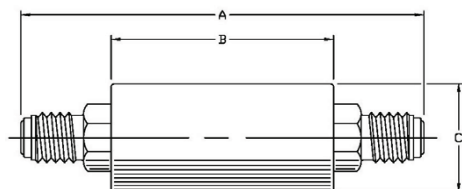
Kr = Krypton

Xe = Xenon

Ne = Neon

(Nominal flow offers one year life based on inlet gas purity of 99.9995% and 24 hours operation)

**Equivalent to the Entegris® Model 500 and SAES® Facilitorr® FT400



MODEL	A in (mm)	B in (mm)	C in (mm)	Nominal Flow Rate	Max Flow Rate
Y40-01KC	8.8"(224)	7.0"(178)	2"(51)	10 slpm	150 slpm
Y40-975C	7.94"(202)	5.7" (145)	3.0"(76)	7.0 slpm	100 slpm

For additional flow rates and options please call 1 – 800-939-5711

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

www.airgas.com

Airgas MaxPur Series Gas Purifiers

Flow rates up to 150 SLPM

The Airgas MaxPur Series Gas Purifier is an easy-to-install gas purification system offering guaranteed maximum performance and extended life. With a choice of five different vessel sizes, this purifier can be a single point of use or it can accommodate flows that support multi-point applications.

Airgas MaxPur can purify nitrogen and all inert gases at flow rates up to 150 slpm while still maintaining the published purity. The purifier vessel's media will last for 12 months with a 24hr/day operation flow at the indicated nominal flow rates*.

Constructed using 316L electro-polished stainless steel with standard 0.1µm filtration, Airgas MaxPur purifiers deliver an ultra-high purity outlet performance ideal for many demanding applications in a variety of industries, including analytical, semiconductor, LED, pharmaceutical and medical.

Design Features

- Compact, sturdy, vented, steel enclosure incorporating all components for ultimate safety
- Easy to install – Wall mounted
- Simple to operate
- Front panel status indicators
- Integral preset temperature controller
- Simple vessel change-out
- Standard Stainless Steel fittings for ultimate outlet purity
- Standard 0.1µm filter (available 0.003µm)
- Complete system leak checked 2×10^{-9} atm cc/sec
- Shipped Activated ready for use

Airgas MaxPur Series

GAS PURIFIER



Specifications	
Gases	Argon, Helium, Neon, Krypton, Xenon and Nitrogen
Outlet gas purity	Impurities removed to <1ppb CO, CO ₂ , H ₂ , H ₂ O, N ₂ , O ₂ and THC Optional H ₂ removal available stage (H)
Flows	Five models to accommodate flows from 0.1 slpm – 150 slpm (max)
Maximum operating pressure	250 psig
Input power	110VAC standard, 220 VAC optional
Inlet/Outlet Connections	¼" MVCR standard; ¼" Swagelok (S04)

Available options

- 220 power VAC
- ¼" compression fittings on inlet and outlet
- Added Hydrogen removal stage
- Available panel mounted with manual isolation and bypass valves
- Please call 1-800- 939-5711 for all options and pricing

Ordering Information

Product Number	Flows (250 psig inlet)		Inlet/Outlet Connections
	Nominal*	Max	
Y40-N050(*Gas)	0.3 slpm	4.5 slpm	¼" MVCR
Y40-N125(*Gas)	1.0 slpm	15 slpm	¼" MVCR
Y40-N250(*Gas)	2.0 slpm	30 slpm	¼" MVCR
Y40-N600(*Gas)	6.0 slpm	90 slpm	¼" MVCR
Y40-N01K(*Gas)	10 slpm	150 slpm	¼" MVCR

*Gas

Ar = Argon

He = Helium

Ne = Neon

Kr = Krypton

N₂ = Nitrogen

Airgas MaxPur Series purifiers can be used for Oxygen Service – Please call 1 – 800-939-5711 for technical support
(Nominal flow offers one year life based on source gas being 99.9995% pure, and 24 hours operation)

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Airgas Ultra Pur Series Gas Purifiers (300 slpm Max)

When higher flows and more system automation are required the Airgas UltraPur Series of purifiers offers the best in guaranteed performance and extended life. Airgas UltraPur purifiers are ideal for multi-point installations or single high-flow applications. These types of flows are supplied from cylinder packs, MicroBulk or bulk supply modes and these purifiers have the capacity to maintain the purity at these flow rates.

Constructed using 316L electro-polished stainless steel with standard 0.1µm filtration, Airgas UltraPur purifiers deliver an ultra-high purity outlet performance ideal for demanding applications in analytical, semiconductor, LED, pharmaceutical, medical, and many other applications.

Airgas UltraPur Gas Purifier

GAS PURIFIER



Design Features

- Compact, sturdy, vented, steel enclosure incorporating all components for ultimate safety
- Easy to install – Wall mounted
- Simple to operate
- Front panel status indicators
- PID heat control with high temperature limits
- Alarm contacts for plant monitoring integration
- Simple vessel change-out
- 316L Stainless Steel construction for ultimate outlet purity
- Standard 0.1µm filter (available 0.003µm)
- Complete system leak checked 2×10^{-9} atm cc/sec
- Shipped Activated ready for use
- Standard Air Operated Inlet/Outlet valves with manual bypass valve

Specifications

Gases	Argon, Helium, Neon, Krypton, Xenon and Nitrogen
Outlet gas purity	Impurities removed to <1ppb CO, CO ₂ , H ₂ , H ₂ O, O ₂ , N ₂ and THC optional H ₂ removal
Flows	2 - 300 slpm (max)
Maximum operating pressure	250 psig
Input power	100/120 VAC optional 220/240VAC
Inlet/Outlet Connections	1/4" MVCR or 1/4" Compression

Ordering Information

Product Number	Flows (250 psig inlet)		Inlet/Outlet Connections
	Nominal	Max	
Y40-N250(*GAS)	2.0 slpm	30 slpm	1/4" MVCR
Y40-N600(*GAS)	6.0 slpm	90 slpm	1/4" MVCR
Y40-N01K(*GAS)	10 slpm	150 slpm	1/4" MVCR
Y40-N02K(*GAS)	20 slpm	300 slpm	1/4" MVCR

*Gas

Ar = Argon

He = Helium

Ne = Neon

Kr = Krypton

N2 = Nitrogen

Airgas UltraPur Series purifiers can be used for Oxygen Service Please call 1 - 800-939-5711 for technical support
(Nominal flow offers one year life based on 99.9995% inlet gas and 24 hours operation)

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

www.airgas.com

Advanced Filter System I (AFS I)

Description: The Advance Filter System I (AFS I) is a high capacity gas purifier that removes O₂, H₂O, and Hydrocarbons with (5 or more carbons) from inert gases, hydrogen, and nitrogen to low ppb levels. Common applications include gas chromatography (GC) and inductively-coupled plasma spectroscopy (ICP).

Because of its features of high capacity and robust construction, the AFS is suitable for installations requiring multiple instruments. AFS features a double sealing system that serves as a safeguard against gas leaks, keeping hazardous gases from escaping into the laboratory.

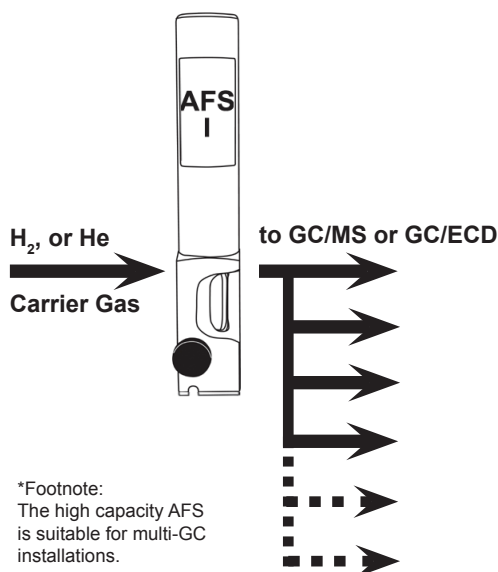
The AFS system requires installation of a stainless steel manifold to the gas line (options are ¼" or ½" standard compression fittings). Brackets and hardware are included to mount the manifold to the bench or wall. Once the manifold is installed the easily replaceable cartridge is attached to the manifold with a clamping knob.

The AFS I is not suitable for use with O₂ or air. The AFS I is strongly recommended for GC/MS testing platforms and for the carrier gas line of GC/FID systems.

Applications

- Point of use purification of carrier gases used with the operation of GC/FID platforms
- Point of use purification of carrier gases used with the operation of GC/MS platforms
- Carrier gas and make-up gas for GC/ECD
- Removal of O₂, H₂O and Hydrocarbons (5 or more carbons)

GC Carrier Gas



CRS

PURIFIERS



Design Features/Components

- Dual Sealing System (Safety)
- Assembled with Heavy Duty Components (Safety)
- Sensitive Visual Indicators (O₂ & H₂O)
- Simple Cartridge Replacement
- Stainless Steel Manifold Fittings
- 10 micron frits on cartridge
- 100% Helium leak tested
- Shipped filled with Helium

Specifications

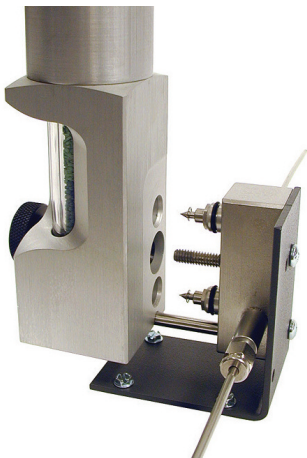
Maximum Operating Pressure:	200 psi
Recommended Maximum Flow:	2 slpm
Source Gas:	He, Ar, N ₂ , H ₂
Maximum Operating Temperature:	35°C
Efficiency:	O ₂ - 5 ppb H ₂ O - 20 ppb HC - 5 ppb (>C4)
O ₂ Capacity:	850 cc
H ₂ O Capacity:	12 g
HC Capacity:	8 g
Dimensions:	12 in. x 2 in. x 2 in.
Approximate Weight:	5.9 lbs.

PURIFIERS

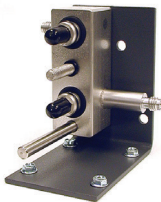
CRS

Advanced Filter System I (AFS I) Cont.

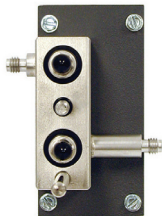
Materials of Constructions		
	Manifold	Purifier Cartridge
Body:	Stainless Steel	Internal Structure: Stainless Steel inner tube, Borosilicate Glass, and Polycarbonate plastic
		External Structure: Aluminim (Anodized)
Fittings:	¼" & ⅝" Stainless Steel Fittings	N/A
O-Ring Seal	Fluoroelastomer	Fluoroelastomer



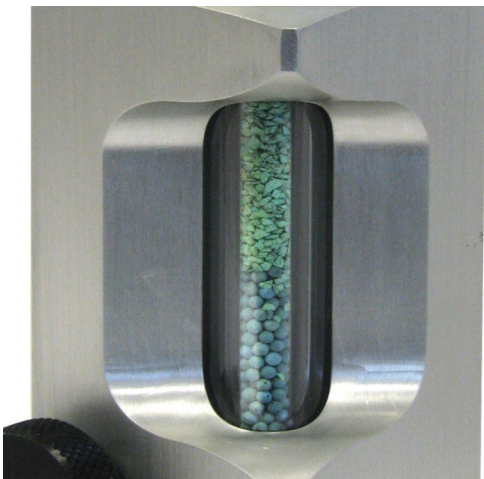
AFS Cartridge and Bench Mount Manifold
Easy to change cartridge. No tools required.



Bench Mount Manifold



Wall Mount Manifold



AFS I indicator, Oxygen is the green indicator that changes to gray when depilated. Moisture is the blue indicator that changes to light brown when depilated.

Ordering Information		
Product Number	Description	Compression Fittings
Y40-AFS18	Advanced Filter System I, Complete Kit	⅝" Fittings
Y40-AFS14	Advanced Filter System I, Complete Kit	¼" Fittings
Y40-AFSRC1	Replacement Cartridge, Advanced Filter System I	
Y40-AFSFSM8	⅝" Advanced Filter System Manifold	
Y40-AFSFSM4	¼" Advanced Filter System Manifold	

Advanced Filter System II (AFS II)

CRS

PURIFIERS

Description: The Advance Filter System II (AFS II) is a high capacity gas purifier that removes H₂O, and Hydrocarbons with (5 or more carbons) from inert gases, hydrogen, and dry air to low ppb levels. Common applications include gas chromatography (GC) and inductively-coupled plasma spectroscopy (ICP).

Because of its features of high capacity and robust construction, the AFS is suitable for installations requiring multiple instruments. AFS features a double sealing system that serves as a safeguard against gas leaks, keeping hazardous gases from escaping into the laboratory.

The AFS system requires installation of a stainless steel manifold to the gas line (options are ¼" or ½" standard compression fittings). Brackets and hardware are included to mount the manifold to the bench or wall. Once the manifold is installed the easily replaceable cartridge is attached to the manifold with a clamping knob.

The AFS II is strongly recommended for GC/FID testing platforms, for the dry air and hydrogen detector gas used for the FID detectors.



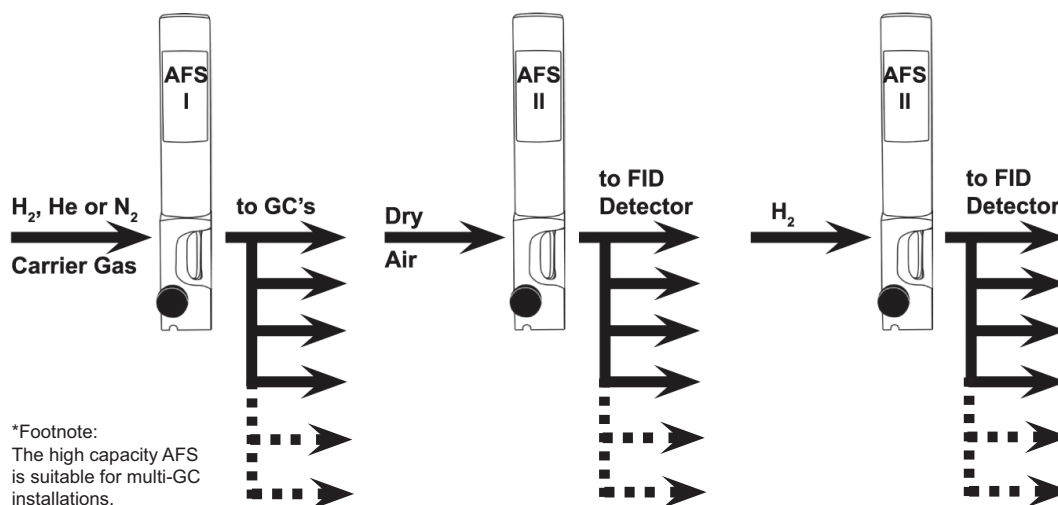
Design Features/Components

- Dual Sealing System (Safety)
- Assembled with Heavy Duty Components (Safety)
- Sensitive Visual Indicators (O₂ & H₂O)
- Simple Cartridge Replacement
- Stainless Steel Manifold Fittings
- 10 micron frits on cartridge
- 100% Helium leak tested
- Shipped filled with Helium

Applications

- Point of use purification Hydrogen FID gas used with the operation of GC/FID platforms
- Point of use purification of dry air FID gas used with the operation of GC/FID platforms
- Removal of H₂O and Hydrocarbons (5 or more carbons)

GC / FID



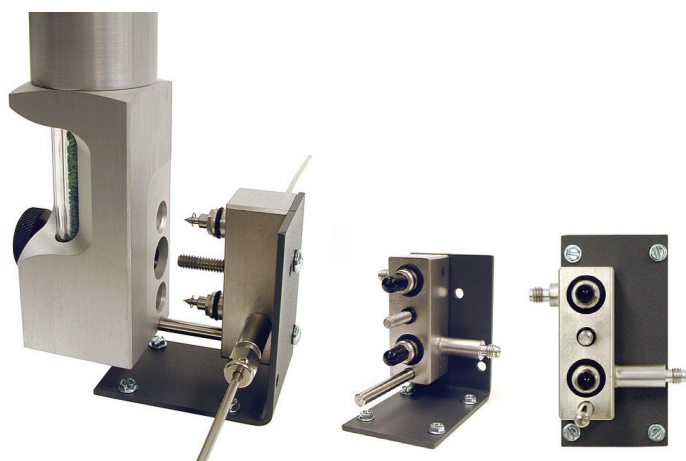
PURIFIERS

CRS

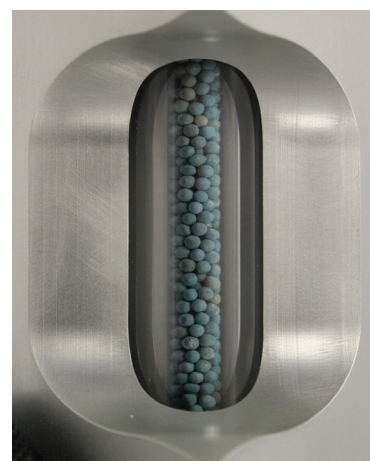
Advanced Filter System II (AFS II) Cont.

Materials of Constructions

	Manifold	Purifier Cartridge
Body:	Stainless Steel	Internal Structure: Stainless Steel inner tube, Borosilicate Glass, and Polycarbonate plastic
		External Structure: Aluminum (Anodized)
Fittings:	¼" & ½" Stainless Steel Fittings	N/A
O-Ring Seal	Fluoroelastomer	Fluoroelastomer



AFS Cartridge and Bench Mount Manifold Bench Mount Manifold Wall Mount Manifold
Easy to change cartridge. No tools required.



AFS II indicator, Moisture is the blue indicator that changes to light brown when depilated.

Specifications

Maximum Operating Pressure:	200 psi
Recommended Maximum Flow:	2 slpm
Source Gas:	H ₂ , Ar, N ₂ , He, O ₂ , dry air
Maximum Operating Temperature:	35°C
Efficiency:	H ₂ O - 20 ppb HC - 5 ppb (>C4)
H₂O Capacity:	12 g
HC Capacity:	8 g
Dimensions:	12 in. x 2 in. x 2 in.
Approximate Weight:	5.9 lbs.

Ordering Information

Product Number	Description	Compression Fittings
Y40-AFS28	Advanced Filter System II, Complete Kit	¼" Fittings
Y40-AFS24	Advanced Filter System II, Complete Kit	¼" Fittings
Y40-AFSRC2	Replacement Cartridge, Advanced Filter System II	
Y40-AFSFSM8	¼" Advanced Filter System Manifold	
Y40-AFSFSM4	¼" Advanced Filter System Manifold	

High Capacity High Flow Purifier

Description: The Airgas high capacity high flow purifier is constructed of a machined aluminum shell that accepts a large capacity cartridge. The aluminum shell can be permanently mounted when installed in the gas line and can be serviced without disturbing the line connections. Spring pressure holds the cartridge tightly against the bottom gasket to prevent the gas to be purified from bypassing the cartridge. The inlet is located at the bottom side of the purifier and the outlet is located at the top.

This Airgas purifier shell must be used in conjunction with specially designed replacement cartridges. These cartridges are supplied in a hermetically sealed can with convenient pull-tab ends for easy opening.

Specifications	
Maximum Operating Pressure	1500 psig
Operating Temperature	-40°F to 200°F
Inlet and Outlet Ports	¼" NPT female
Dimensions	4-1/2" dia x 15-9/16" long
Dew Point Achievable	-100°F
Weight with Cartridge	12.6 lbs

Materials	
Shell Body	Aluminum
Gasket	Buna-N
Cartridges	See below

High Capacity High Flow

PURIFIER



Design Features

- Handles large flow rates up to 15 SCFM
- Hermetically sealed replacement materials

Ordering Information			
Product Number	Description	Absorption Capacity	Application
Y40-HFPS8000	Purifier Shell Only		
Y40-HF13X8001	Molecular Sieve 13X	126 grams of water	Removal of oil & water from inert gases and saturated hydrocarbons
Y40-HF4A8002	Molecular Sieve 4A	134 grams of water	Removal of water
Y40-HFAC8003	Activated Charcoal (Do not use with oxygen concentrations in excess of 21%)		Removal of heavy hydrocarbons acetone level control in acetylene used for atomic absorption
Y40-HF3A8004	Molecular Sieve 3A		Removal of water from unsaturated hydrocarbons such as acetylene
Y40-HF5A8002	Molecular Sieve 5A		

This purifier is not suitable for oxygen service

Gas-Specific Purifiers/Traps

Description: Airgas® line of gas purifiers combines new synthetic zeolite adsorbent materials technology with a unified gas purifier approach to produce a new generation of gas purification products. Instead of installing three purifiers to remove the three common classes of contaminants (oxygen, moisture and hydrocarbons), these Gas-Specific Purifier Modules combine these capabilities into a single gas-specific purifier module. These modules preferentially remove selected contaminants from the gas.

These modules reduce contaminant levels (from higher than fifty parts per million to less than twenty-five parts per billion) and adsorb a larger number of contaminants than the commonly used adsorbent materials. Their performance is further enhanced by incorporating multiple beds of proprietary adsorbent materials so that each successive bed functions to lower the levels of contaminants in a step function. When these technical features are combined with advanced zeolite adsorbent materials technology, vastly more efficient purifiers are the result.

This new gas-specific purifier technology is so efficient and effective that it is supplied with or recommended by every major mass spectrometer manufacturer to enhance baseline stability and lower the noise of baseline. Capillary column life and performance are improved by preventing contamination of the column with water, oxygen or hydrocarbons.



Design Features

- Reduce carrier gas impurities.
- Decrease GC background noise.
- One purifier removes all three classes of contaminants (oxygen, moisture, and hydrocarbons).
- Increase GC/MS sensitivity and dynamic range.

Specifications

Dimensions	400 cc, 22.5" x 1.5" aluminum tube (50.8 cm x 3.8 cm)
Maximum Pressure	1000 psig
Maximum Temperature	80°C
Packing	Proprietary synthetic zeolite adsorbent
Additional Information	Purifier must be mounted in vertical position

Contaminant Selectivity/Contaminant Outlet Level in ppb (1)

Module	CO	CO ₂	O ₂	N ₂	H ₂ O	THC
Module Selectivity and Purity Specifications						
Helium Purifier	High/<20	High/<10	High/<10	N/A	High/<25	High/<10
Hydrogen Purifier	High/<20	High/<10	High/<10	N/A	High/<25	High/<10
Nitrogen Purifier	High/<20	High/<10	High/<10	N/A	High/<25	High/<10
Air Purifier (2)	High/<20	High/<10	N/A	N/A	High/<25	High/<10
Moisture Trap (3)	High/<20	High/<10	N/A	N/A	High/<25	Moderate/*
Hydrocarbon Trap (3, 4)	N/A	N/A	N/A	N/A	High/<25	N/A
Oxygen Trap (3, 5)	Slight/*	Slight/*	High/<10	High/<25	Moderate/*	N/A

(1) All of the output concentrations are based on a flow rate of 150 mL/minute. (2) Based on vehicle emission zero air. (3) The performance of the trap depends on the gas used; output levels are referenced to 99.995% helium. (4) Do not use for oxygen purification. (5) Do not use if inlet gas has more than 100 ppm hydrocarbons.

* Not detectable.

GAS PURIFIERS

Gas-Specific

Gas-Specific Purifiers/Traps Cont.

Ordering Information		
Product Number	Gas Service	Description
Purifiers		
Y40-P1001	Helium	1/8" Fitting
Y40-P1002		1/4" Fitting
Y40-P2001	Hydrogen	1/8" Fitting
Y40-P2002		1/4" Fitting
Y40-P3001	Nitrogen	1/8" Fitting
Y40-P3002		1/4" Fitting
Y40-P4001	Air	1/8" Fitting
Y40-P4002		1/4" Fitting
Traps		
Y40-T1001	Moisture	1/8" Fitting
Y40-T1002		1/4" Fitting
Y40-T2001	Hydrocarbon	1/8" Fitting
Y40-T2002		1/4" Fitting
Y40-T3001	Oxygen	1/8" Fitting
Y40-T3002		1/4" Fitting

OMI-2 Indicating Purifier

OMI-2

GAS PURIFIERS

Description: The OMI-2 Indicating Purifier irreversibly removes contaminants from carrier gases.

Use this indicating purifier for point-of-use gas polishing and final visual quality assurance before gas enters the GC. As little as 1 ppm of oxygen or moisture will change the indicating resin from black to brown. The tube contains Nanochem® resin, developed for the demanding gas purity needs of today's analytical laboratory.

NOTE: The OMI-2 Purifier represents an improved version of its predecessor, the OMI-1, which is no longer available. Current owners of the OMI-1 will still be able to purchase replacement tubes for the OMI-1 tube holders.



Design Features

New design for easier replacement of tubes.

Simultaneously removes oxygen, water vapor, carbon monoxide, carbon dioxide, most sulfur compounds, most halogen compounds, alcohols, and phenols to less than 109 ppb.

Effectively purifies helium, hydrogen, nitrogen, argon/methane, and ammonia.

Glass body does not diffuse air or off-gas.

Ideal for Hall®, ECD, and GC/MS detection systems.

Color change provides positive indication of purifier exhaustion.

Improved design prevents air from entering the new tube, preserving the resin.

Ordering Information

Product Number	Description
Y40-23921	OMI-2 Tube Holder
Y40-23906	OMI-2 Packed Tube
Y40-23917	Seal Kit for OMI-2 Tube Holder (includes two PTFE® seals)

OMI purifiers contain Nanochem resin, licensed to Supelco, Inc. for use in chromatographic applications. Nanochem is a registered trademark of Hercules, Inc.

Gas Drying Tube (Refillable)

Gas Drying Tube

GAS PURIFIERS

Description: This molecular sieve drying tube is designed for the removal of excessive moisture and heavy hydrocarbons such as pump oils. It may be used in a variety of applications such as compressor delivered gases, electrolytic hydrogen, in-house gas lines or anywhere where moisture and oil may be a problem. This trap may also be used as additional protection on high-purity gas systems where even routine cylinder



changes may introduce moisture. The trap consists of a 24" metal tube filled with ½ pound of molecular sieve 5A and is capable of reducing water concentration to less than 0.1 ppm.

Ordering Information

Product Number	Description
Y40-20618	Gas Drying Tube ¼" Compression
Y40-20619	Gas Drying Tube ⅜" Compression
Y40-20298	Molecular Sieve 5A, ½ lb.

Click-On Inline Super-Clean® Purifiers

SGT™

PURIFIERS

Description: The Airgas® Click-On Inline Super-Clean® purifiers are the latest in in-line gas filtration. Click-On adaptor connectors allow purifiers to be exchanged without introducing oxygen. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no need for loosening and tightening fittings every time a purifier is changed, and your system will not become contaminated during the process.

The Triple Click-On Purifier is ideal for purifying carrier gas-it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.

The Fuel Gas Click-On Purifier is ideal for purifying flame ionization detector (FIC) fuel gases, removing both moisture and hydrocarbons.

The Helium-Specific Triple Click-On Purifier is ideal for purifying helium in GC/MS systems. This Click-On purifier under helium contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge, and is packed and purged.

Click-On purifier replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a purifier to indicate when the purifier should be replaced.



*Quick
changeout*

*World-class
performance*

*Ideal for purifying
gases*

Design Features/Components

- High-purity output ensures 99.9999% pure gas
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel, 1/4" or 1/2"
- Helium-Specific Triple Purifier is ideal for GC/MS

Inline Super-Clean® Specifications

Type	Output Quality	Max Pressure	Max Flow	Used For	Capacity	Estimated Lifetime (years)
Moisture	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier, Helium, Air, H ₂	21 g H ₂ O	>3
Oxygen	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier	3000 mL	>3
Hydrocarbon	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier, Helium, Air, H ₂	36 g HCs ³	>3
Fuel Gas ¹	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier, Helium, Air, H ₂	10 g H ₂ O; 18 g HCs ³	>2
Triple ²	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier	6 g H ₂ O; 12 g HCs ³	>2

¹Removes hydrocarbons, moisture.

²Removes hydrocarbons, moisture, oxygen

³As n-butane.

Note: Super-Clean® Gas Filters are recommended for purifying non-corrosive gases with low concentration of contaminants. The maximum concentration of O₂ in the incoming gas stream for oxygen purifiers is 0.5%.

PURIFIERS

SGT™

Click-On Inline Super-Clean® Purifiers® Cont.

Ordering Information—Click-On Inline Super-Clean® Purifier and Connector Kits

Product Number	Description	Quantity
Y40-CO1005KS8	Carrier Gas Purification Kit, 1/8" Stainless Steel Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	kit
Y40-CO1005KB8	Carrier Gas Purification Kit, 1/8" Brass Includes (2) 1/8" Brass connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	kit
Y40-CO1005KS4	Carrier Gas Purification Kit, 1/4" Stainless Steel Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	kit
Y40-CO1005KB4	Carrier Gas Purification Kit, 1/4" Brass Includes (2) 1/4" Brass connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	kit
Y40-CO1007KS8	Fuel Gas Purification Kit, 1/8" Stainless Steel Includes (4) 1/8" SS connectors and (2) hydrocarbon/moisture purifiers	kit
Y40-CO1007KB8	Fuel Gas Purification Kit, 1/8" Brass Includes (4) 1/8" Brass connectors and (2) hydrocarbon/moisture purifiers	kit
Y40-CO1007KS4	Fuel Gas Purification Kit, 1/4" Stainless Steel Includes (4) 1/4" SS connectors and (2) hydrocarbon/moisture purifiers	kit
Y40-CO1007KB4	Fuel Gas Purification Kit, 1/4" Brass Includes (4) 1/4" Brass connectors and (2) hydrocarbon/moisture purifiers	kit



Ordering Information—Replacement Click-On Inline Super-Clean® Purifiers

Product Number	Description	Quantity
Y40-CO1005	Replacement Click-On Super-Clean® Triple Purifier (removes oxygen, moisture and hydrocarbons)	ea.
Y40-CO1007	Replacement Click-On Super-Clean® Fuel Gas Purifier (removes moisture and hydrocarbons)	ea.

Ordering Information—Click-On Inline Super-Clean® Ultra-High Capacity Purifiers

Product Number	Description	Quantity
Y40-CO1001	Ultra-High Capacity Moisture Purifier	ea.
Y40-CO1002	Ultra-High Capacity Oxygen Purifier	ea.
Y40-CO1003	Ultra-High Capacity Hydrocarbon Purifier	ea.

Ordering Information—Helium-Specific Click-On Inline Super-Clean® Purifier and Kits

Product Number	Description	Quantity
Kits		
Y40-CO1061KS8	Helium-Specific Carrier Gas Cleaning Kit, 1/8" Stainless Steel - Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon Helium-Specific Triple Purifier	kit
Y40-CO1061KB8	Helium-Specific Carrier Gas Cleaning Kit, 1/8" Brass - Includes (2) 1/8" Brass connectors and (1) oxygen/moisture/hydrocarbon Helium-Specific Triple Purifier	kit
Y40-CO1061KS4	Helium-Specific Carrier Gas Cleaning Kit, 1/4" Stainless Steel - Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon Helium-Specific Triple Purifier	kit
Y40-CO1061KB4	Helium-Specific Carrier Gas Cleaning Kit, 1/4" Brass - Includes (2) 1/4" Brass connectors and (1) oxygen/moisture/hydrocarbon Helium-Specific Triple Purifier	kit
Replacement Purifier		
Y40-CO1061	Replacement Helium-Specific Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.

Click-On Inline Super-Clean® Purifiers Cont.

SGT™

PURIFIERS



World-class
performance

Ordering Information—Click-On Inline Super-Clean® Indicator

Product Number	Description	Quantity
	Click-On Inline Super-Clean® Indicator (oxygen, moisture plus adsorbents and hydrocarbons)	ea.
	° Indicator color change: Oxygen: green to gray; Moisture: beige to clear	



Ordering Information—Replacement Click-On Inline Super-Clean® Purifiers

Product Number	Description	Quantity
Y40-C02011	Carrier Gas Purification Kit, 1/8" Stainless Steel Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	2-pk.
Y40-C02002	Carrier Gas Purification Kit, 1/8" Brass Includes (2) 1/8" Brass connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	2-pk.
Y40-C02010	Carrier Gas Purification Kit, 1/4" Stainless Steel Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	2-pk.
Y40-C02001	Carrier Gas Purification Kit, 1/4" Brass Includes (2) 1/4" Brass connectors and (1) oxygen/moisture/hydrocarbon Triple Purifier	2-pk.



Ordering Information—Click-On Inline Super-Clean® Double Connector

Product Number	Description	Quantity
Y40-C02020	Click-On Inline Super-Clean® Double Connector (stainless steel purifier and indicator connector)	ea.
	° Connects any Click-On purifier to an indicator.	

Ordering Information—Wall-Mounting Clamps for Click-On Inline Super-Clean® Purifiers

Product Number	Description	Quantity
Y40-C03002	Wall-mounting Clamps for Click-On Inline Super-Clean® Purifiers	4-pk.

Ordering Information—Replacement O-Rings for Click-On Inline Super-Clean® Connectors

Product Number	Description	Quantity
Y40-C03001	Replacement O-Rings for Click-On Inline Super-Clean® Connectors	10-pk.

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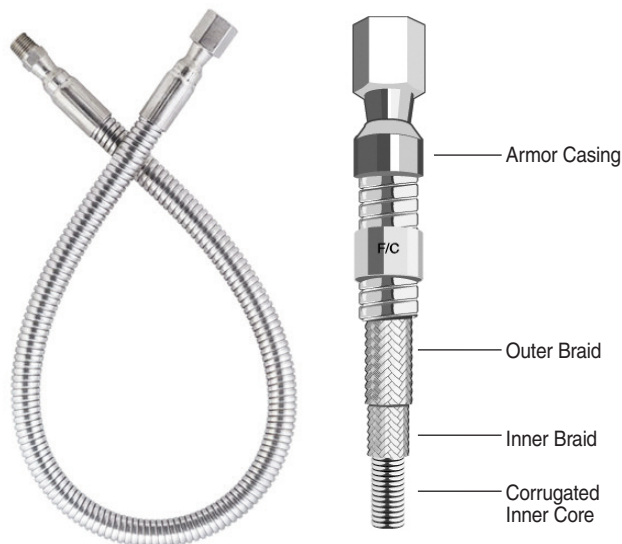


Airgas.
You'll find it with us.™

PIGTAILS AND HOSES

Hoses

Flexible Metal Hoses



Description: These flexible metal hoses are fabricated from 316L stainless steel corrugated bellows and feature an inner core reinforced with two stainless steel braids. The inner core and double braids are welded to the end fittings and a protective armor casing is attached to the exterior. These hoses are ideal for high-pressure and low-pressure plumbing connections. With the additions of CGA connectors, they make very usable flexible pigtails.

These hoses are specially cleaned for all analytical applications. They are extremely flexible. The outer anti-kink armour protects the hose and prevents kinking.

Design Features

Stainless Steel Construction
provides excellent diffusion and corrosion resistance.

High Convolution Count
provides excellent flexibility.

Cleaned for Oxygen and Analytical Service
allows high-purity gas handling without costly pre-cleaning.

Specifications/Materials

Maximum Rated Inlet Pressure	3,000 psig
Proof Pressure	4,800 psig
Burst Pressure	13,000 psig
Internal Diameter	1/4" Minimum
Materials	316L and 321 (braids) Stainless Steel
End Connections	316 Stainless Steel

Ordering Information

Product Number	End Connections	Length (inches)
Y15-4PFLX24FF	1/4" FNPT x 1/4" FNPT	24
Y15-4PFLX24FM	1/4" FNPT x 1/4" MNPT	24
Y15-4PFLX30FF	1/4" FNPT x 1/4" FNPT	30
Y15-4PFLX30FM	1/4" FNPT x 1/4" MNPT	30
Y15-4PFLX36FF	1/4" FNPT x 1/4" FNPT	36
Y15-4PFLX36FM	1/4" FNPT x 1/4" MNPT	36
Y15-4PFLX48FF	1/4" FNPT x 1/4" FNPT	48
Y15-4PFLX48FM	1/4" FNPT x 1/4" MNPT	48
Y15-4PFLX72FF	1/4" FNPT x 1/4" FNPT	72
Y15-4PFLX72FM	1/4" FNPT x 1/4" MNPT	72
Y15-4PFLX120FM	1/4" FNPT x 1/4" MNPT	120

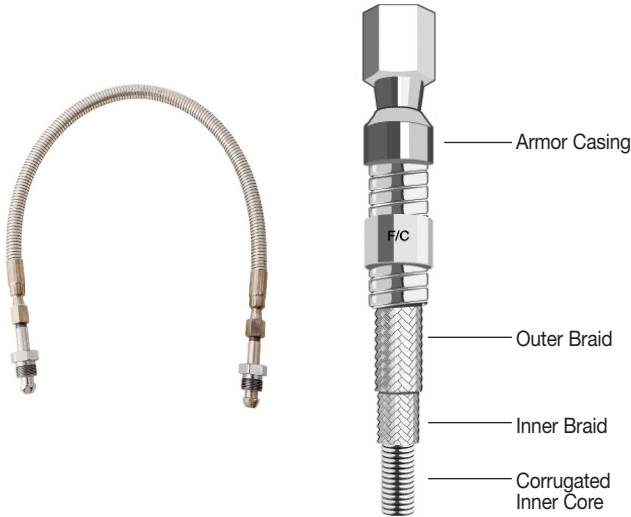
Flexible Metal Pigtails

Pigtails

PIGTAILS AND HOSES

Description: These 30" flexible pigtails have a standard CGA on one end and a check valve CGA on the other end.

The flexible metal hoses are fabricated from 316L stainless steel corrugated bellows and feature an inner core reinforced with two stainless steel braids. The inner core and double braids are welded to the end fittings and a protective armor casing is attached to the exterior. These pigtails are cleaned for all analytical applications.



Design Features

Stainless Steel Construction
provides excellent diffusion and corrosion resistance.

High Convolution Count
provides excellent flexibility.

Cleaned for Oxygen Service
allows high-purity gas handling without costly pre-cleaning.

Specifications/Materials

Maximum Rated Inlet Pressure	3,000 psig
Proof Pressure	4,800 psig
Burst Pressure	13,000 psig
Internal Diameter	1/4" Minimum
Materials	316L and 321 (braids) Stainless Steel

Ordering Information

Product Number	Description	MAWP (psi)	CGA Material	Check Valve CGA
Y15-1P30CK(CGA)	30" Flexible Stainless Steel Pigtail	3,000	Nickel-Plated Brass	Yes
Y15-4P30SS(CGA)	30" Flexible Stainless Steel Pigtail	3,000	316L SS	Yes

PIGTAILS AND HOSES

Hoses

Synflex® Hoses



Description: These flexible hoses are for general-purpose or industrial applications only. Constructed of nylon Synflex® material, they are ideal for a wide range of general-purpose applications.

Note: These hoses are not approved for oxygen or chromatography service.

Specifications/Materials

Maximum Rated Inlet Pressure	3,000 psig
End Connections	Steel

Ordering Information

Product Number	End Fittings	Length (inches)
Y15-4SYN30FF	1/4" FNPT x 1/4" FNPT	30
Y15-4SYN30FM	1/4" FNPT x 1/4" MNPT	30
Y15-4SYN48FM	1/4" FNPT x 1/4" MNPT	48
Y15-4SYN72FM	1/4" FNPT x 1/4" MNPT	72

PIGTAILS AND HOSES

Pigtails

Synflex® Pigtails



Description: These flexible pigtails are for general- or industrial-purpose use. The pigtail consists of a 30" nylon Synflex hose, a brass nickel plated check valve CGA on the cylinder end and a standard CGA on the other end.

Note: These pigtails are not approved for oxygen or chromatography service.

Specifications/Materials

Maximum Rated Inlet Pressure	3,000 psig
End Connections	Steel

Ordering Information

Product Number	Description	MAWP (psi)	CGA Material
Y15-1S30CK(CGA)	30" Flexible Stainless Synflex® Pigtail	3,000	Nickel-Plated Bras

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Pressure Gauges 2½"

Pressure Gauges

GAUGES



Description: Airgas® offers a wide selection of industry standard pressure gauges. These nickel-plated brass, stainless steel and monel gauges feature a single psig scale. All gauges are cleaned to analytical and oxygen service standards.

The large, bold font makes valves very easy to read.

Rated accuracy is stated as a percentage of full-scale reading of the gauge. Brass and Monel gauges are accurate to ±3% for the first third of the scale, ±2% of the second third, and ±3% of the last third of the scale. All stainless steel gauges are accurate to ±1% full scale.

All gauges meet ASTM standards for safety and have a ¼" MNPT lower-mount design (except where noted).

Specifications

Bourdon Tube	Brass — phosphor bronze up to 1,000 psig; beryllium copper above 1,000 psig Stainless Steel — 316 stainless steel Monel — Monel
Connections	¼" MNPT lower mount except where noted
Safety	Oversized case cutout for socket
Ambient Operating Temperature	–40° F to +150° F
Accuracy	See Description
Shipping Weight	1 lb

Ordering Information

Product Number	Material	Range	Graduations
* Y19-115A03	Brass	0-30	1
* Y19-115C10	Brass	0-100	2
**Y19-115D40	Brass	0-4,000	100
Y19-125A015	Brass	0-15	0.5
Y19-125A0303	Brass	30" Hg-0-30	1
Y19-125A03	Brass	0-30	1
Y19-125A06	Brass	0-60	2
Y19-125C10	Brass	0-100	2
Y19-125C20	Brass	0-200	5
Y19-125C40	Brass	0-400	10
Y19-125C50	Brass	0-500	10
Y19-125D10	Brass	0-1,000	20
Y19-125D40	Brass	0-4,000	100
Y19-125D60	Brass	0-6,000	100
Y19-125D00	Brass	0-10,000	200
Y19-325A03	Monel	0-30	1
Y19-325C10	Monel	0-100	2
Y19-325C30	Monel	0-300	5
Y19-325C50	Monel	0-500	10
Y19-325D10	Monel	0-1,000	20
Y19-325D30	Monel	0-3,000	50
Y19-425A0303	Stainless Steel	30" Hg-0-30	1
Y19-425A03	Stainless Steel	0-30	1
Y19-425A06	Stainless Steel	0-60	2
Y19-425C10	Stainless Steel	0-100	2
Y19-425C20	Stainless Steel	0-200	5
Y19-425C40	Stainless Steel	0-400	10
Y19-425C50	Stainless Steel	0-500	10
Y19-425D10	Stainless Steel	0-1,000	20
Y19-425D30	Stainless Steel	0-3,000	50
Y19-425D40	Stainless Steel	0-4,000	50
Y19-425D60	Stainless Steel	0-6,000	100
Y19-425D00	Stainless Steel	0-10,000	200

* 1/8" MNPT rear mount 2" Dia.

** 1/4" MNPT bottom mount 2" Dia.

GAUGES

Pressure Gauges VCR

VCR Connection Gauges 2" Diameter



Ordering Information		2" female VCR® models	
Product Number	Material	Range	Graduations
Y19-413937	Stainless Steel	0-4,000	100
Y19-413938	Stainless Steel	0-3,000	50
Y19-413939	Stainless Steel	0-1,000	20
Y19-413940	Stainless Steel	0-200	5
Y19-413941	Stainless Steel	0-100	2
Y19-413942	Stainless Steel	30" Hg-0-30	1
Y19-413943	Stainless Steel	0-30	1
Y19-415125	Stainless Steel	0-60	2

Pressure Switch Gauges with Reed Switch

Description: These indicating pressure switch gauges with reed contact assemblies are designed to provide economical pressure monitoring, set-point indication, and fast switching for low-power electrical signals. These gauges incorporate a magnetically actuated reed switch capable of operating low-voltage annunciators, lights or relays. These gauges are typically installed on regulators and changeover manifolds to activate an external alarm when a certain predetermined pressure is reached.

The switch set point can be adjusted to any pressure between 2% and 90% of the full scale value by moving the red indicator pin on the front of the gauge dial to the desired set point. These gauges are designed to work on decreasing pressure only. The magnetic indicating pointer “opens” the switch when contact is made with the index. The gauge is designed to move further on the scale while permitting the switch to remain “open”.

Design Features

- Visual pressure indication
- Switch closure for remote alarming

Materials

Socket	316 Stainless Steel / Brass
Bourdon Tube	316 Stainless Steel / Brass
Case and Bayonet Ring	304 Stainless Steel

Pressure Switches

INDICATING PRESSURE SWITCH GAUGES



Specifications

Indication Accuracy	+/- 2% of Span
Operating Temperature Range	- 20°F to 165°F
Dial Face Size	2 1/2" Diameter
Connection Size	1/4" NPT male
Maximum Switching	Capacity: 10 watts , 10 VA (AC) Current: 0.5 amps DC or AC with resistive load Voltage: 75 Volts DC or 50 Volts AC
Dead Band	2.5% maximum
Connection	39" lead connection cable with 2 wires
Safety Feature	Solid front and full blow-out safety back

Ordering Information

Product Number	Material	Delivery Pressure Range	Case Configuration	Connection Location	Adjustment Set-point	
					Min (psig)	Max (psig)
Y19-125C20PS	Brass	0-200 psig	Radial	Bottom	4	180
Y19-125C60PS	Brass	0-600 psig	Radial	Bottom	12	540
Y19-125D30PS	Brass	0-3000 psig	Radial	Bottom	60	2700
Y19-125C60PMPS	Brass	0-600 psig	Panel Mount	Lower Back	12	540
Y19-125D30PMPS	Brass	0-3000 psig	Panel Mount	Lower Back	60	2700
Y19-425C20PS	Stainless Steel	0-200 psig	Radial	Bottom	4	180
Y19-425C60PS	Stainless Steel	0-600 psig	Radial	Bottom	12	540
Y19-425D30PS	Stainless Steel	0-3000 psig	Radial	Bottom	60	2700
Y19-425C60PMPS	Stainless Steel	0-600 psig	Panel Mount	Lower Back	12	540
Y19-425D30PMPS	Stainless Steel	0-3000 psig	Panel Mount	Lower Back	60	2700

Warning: Not for use with flammable gases without an intrinsically safe barrier

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Airgas.
You'll find it with us.™

Gas Grade Selection Table for Gas Chromatography (GC)

Detector	Minimum Gas Grade Recommended for Your Limit of Detection			
	Trace (0–1 ppm)	1–1,000 ppm	1,000 ppm–1%	1%–100%
FID (Flame Ionization Detector)				
Helium	Research	UPC	UPC	UHP
Nitrogen	Research	UPC	UPC	UHP
Hydrogen	Research	UPC	UPC	UHP
Air	Ultra Zero	Ultra Zero	Zero	Zero
Carbon Dioxide	SFC/SFE	SFC/SFE	SFC/SFE	SFC/SFE
ECD (Electron Capture Detector)				
Carbon Dioxide	SFC/SFE	SFC/SFE	SFC/SFE	SFC/SFE
P5	ECD	ECD	ECD	N/A
Nitrogen	Research	Research	UPC	N/A
Helium	Research	Research	UPC	N/A
TCD (Thermal Conductivity Detector)				
Helium	Research	Research	UPC	UHP
Nitrogen	Research	UPC	UPC	UHP
Argon	Research	UPC	UHP	UHP
Hydrogen	Research	UPC	UHP	UHP
FPD (Flame Photometric Detector)				
Nitrogen	Research	UPC	N/A	N/A
Helium	Research	UPC	N/A	N/A
Hydrogen	Research	UPC	N/A	N/A
Air	Ultra Zero	Ultra Zero	N/A	N/A
PID (Photoionization Detector)				
Argon	UPC	UPC	UPC	N/A
Nitrogen	UPC	UPC	UPC	N/A
Helium	UPC	UPC	UPC	N/A
Hall® (Electrolytic Conductivity Detector)				
Helium	Research	UPC	N/A	N/A
Hydrogen	Research	UPC	N/A	N/A
Nitrogen	Research	UPC	N/A	N/A
Air	UPC	UPC	N/A	N/A
MSD (Mass Selective Detector)				
Helium	Research	UPC	UPC	UHP
Nitrogen	Research	UPC	UPC	UHP
Hydrogen	Research	UPC	UPC	UHP
Argon	Research	UPC	UHP	UHP
HID (Helium Ionization Detector)				
Helium	Research	Research	N/A	N/A
Helium Purge	UPC	UPC	N/A	N/A
DID (Discharge Ionization Detector)				
Helium	Research	Research	Research	N/A
Helium Purge	UPC	UHP	UHP	N/A
USD (Ultrasonic Detector)				
Argon	Research	Research	UPC	UHP
Helium	Research	Research	UPC	UHP
SCD (Sulfur Chemiluminescent Detector)				
Hydrogen	UPC	UPC	UHP	N/A
Air	Ultra Zero	Ultra Zero	Zero	N/A
PFPD (Pulsed Flame Photometric Detector)				
Hydrogen	Research	UPC	N/A	N/A
Air	Ultra Zero	Ultra Zero	N/A	N/A
Nitrogen	Research	UPC	N/A	N/A
Helium	Research	UPC	N/A	N/A
PDD (Pulsed Discharge Detector)				
Helium	Research	Research	UPC	N/A
He Purge	UPC	UHP	UHP	N/A
2% Argon/Helium	Research	Research	UPC	N/A
2% Krypton/Helium	Research	Research	UPC	N/A
2% Xenon/Helium	Research	Research	UPC	N/A

BIP® technology (an Air Products innovation) gases are available for argon, helium and nitrogen. For gas chromatography, *BIP* technology represents the best choice for purity. See the Special Applications section for more details.

Hydrogen Generators for Fuel and Carrier Gas

Description: The Airgas H2PEMPD Series of Hydrogen Generators are an excellent source of ultra pure, dry hydrogen for a wide range of laboratory uses. The generators are used extensively with Gas Chromatographs, as a fuel gas for Flame Ionization Detectors (FID), as a reaction gas for Hall Detectors, and as a carrier gas to ensure absolute repeatability of retention times. In high sensitivity trace hydrocarbon analyzers and air pollution monitors, the hydrogen produced ensures the lowest possible background noise.

Other applications include using hydrogen for hydrogenation reactions and for FIDs used in the analysis of engine gas emissions in the automobile industry.

With an output capacity of up to 1,300 cc/minute, one generator can supply 99.99999+% pure carrier gas at up to 175 psig to multiple GCs, and fuel gas up to 45 FIDs. The Airgas H2PEMPD series of Hydrogen generators use a Proton Exchange Membrane (PEM) to produce hydrogen on demand. Each generator incorporates a maintenance free palladium purifier module to remove oxygen down to <0.01 ppm and moisture down to <1.0 ppm. Only 100 mL of hydrogen gas is stored in the system at any time. Based on cylinder gas savings alone, a Airgas hydrogen generator pays for itself in less than one year.

The H2PEMPD series of hydrogen generators incorporate breakthrough software and microprocessor controls to provide many new features. Up to 32 hydrogen generators can be connected together using Parkers' cascading, load balancing software to supply gas to a large gas delivery system. Built in remote monitoring capability enables users to view system performance from a PC; multiple systems can be monitored at one time. Data logging of gas gener-

Hydrogen

GENERATORS



Model Y80 -H2PEMPD Hydrogen Generator



ator performance is incorporated into the H2PEMPD series for use in regulated environments where system validation may be required.

Airgas hydrogen generators meet the strict safety guidelines of the National Fire Protection Agency (NFPA) and the regulations of the Occupational Safety and Health Association (OSHA). Airgas hydrogen generators are certified for laboratory use by CSA, IEC 1010, and CE. Proven in over 40,000 GC installations worldwide, Airgas generators are the most reliable hydrogen generators on the market. Maintenance requires only a few moments per year - no inconvenient, extended downtime. Simply change the deionizer cartridge every six months. In all applications the Airgas Hydrogen Generator sets the standard for safety, operational performance and dependability.

Design Features

- Flow capacity up to 1,300 cc/min
- Delivery pressure of up to 175 PSIG; ideal for high speed and fast GC applications
- Eliminates dangerous and expensive helium and hydrogen gas cylinders
- Safe - produces only as much gas as you need
- Produces a continuous supply of 99.99999+% pure hydrogen gas; palladium membrane prevents baseline drift unlike auto-drying technologies
- Compact and reliable - only one square foot of bench space required
- Automatic water feed for continuous operation, 24/7
- Cascading feature enables users to connect as many as 32 hydrogen generators together to supply a large number of instruments
- Remote PC monitoring features
- Advanced PEM electrochemical cell protection system with micro-processor controls
- Simple maintenance, without Snap-on downstream purifiers
- Certified for laboratory use by CSA, IEC 1010, and CE Mark

Hydrogen Generators for Fuel and Carrier Gas Cont.

Hydrogen

GENERATORS

Simple Experimental: The two merged baselines in the right chromatogram were created using a Gow-Mac Gas Chromatograph Series 590 equipped with a (DID) discharge ionization detector with hydrogen separator. In creating both baselines (black and red) the gas sample is hydrogen from a hydrogen generator. Both generators are the same - as hydrogen gas is produced from water via electrolytic disassociation, but differ slightly as one generator incorporates a desiccant drying tube as a final purifier while the second generator has a palladium membrane as the final purifier.

The large black peak represents a combined 12 ppm concentration of oxygen and nitrogen, suitable for hydrogen fuel gas while the corresponding point in the red baseline represents a combined 12 ppb concentration of oxygen and nitrogen, suitable for either fuel or carrier gas.

Principal Specifications					
Description	Y80-H2PEMPD510	Y80-H2PEMPD650	Y80-H2PEMPD850	Y80-H2PEMPD1100	Y80-H2PEMPD1300
Hydrogen Purity	99.99999+%	99.99999+%	99.99999+%	99.99999+%	99.99999+%
Max Hydrogen Flow Rate	510 cc/min	650 cc/min	850 cc/min	1100 cc/min	1300 cc/min
Oxygen Content	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm
Water Content	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm
Max Outlet Pressure (1)	100 or 175 PSIG (6.8 or 11.9 Bar)	100 or 175 PSIG (6.8 or 11.9 Bar)	100 or 175 PSIG (6.8 or 11.9 Bar) (100 or 175 PSIG (6.8 or 11.9 Bar)	100 or 175 PSIG (6.8 or 11.9 Bar)
Electrical Requirements	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz
Outlet Connection	¼" Compression	¼" Compression	¼" Compression	¼" Compression	¼" Compression
Dimensions	17.1"h x 13.5"w x 21"d (43.5cm x 34cm x 53cm) for all models				
Shipping Weight	60 lb (27.4 kg) for all models				

NOTES: 1 H2PEMPD Hydrogen generators are available with maximum pressure of either 100 or 175 PSIG. See Ordering Information for pressure selection

Ordering Information					
For technical support of this product call 1-800-939-5711 between 8 AM – 7 PM EST					
	Y80-H2PEMPD510	Y80-H2PEMPD650	Y80-H2PEMPD850	Y80-H2PEMPD1100	Y80-H2PEMPD1300
Max Outlet Pressure to 100 PSIG (6.8 bar)	Y80-H2PEMPD510100	Y80-H2PEMPD650100	Y80-H2PEMPD850100	Y80-H2PEMPD1100100	Y80-H2PEMPD1300100
Max Outlet Pressure to 175 PSIG (11.9 bar)	Y80-H2PEMPD510175	Y80-H2PEMPD650175	Y80-H2PEMPD850175	Y80-H2PEMPD1100175	Y80-H2PEMPD1300175
Six Month Preventative Maintenance*	Y80-H2PEMPDPM	Y80-H2PEMPDPM	Y80-H2PEMPDPM	Y80-H2PEMPDPM	Y80-H2PEMPDPM
Two Year Preventative Maintenance*	Y80-H2PEMPDPMPL	Y80-H2PEMPDPMPL	Y80-H2PEMPDPMPL	Y80-H2PEMPDPMPL	Y80-H2PEMPDPMPL

* Include field service

Fuel Grade Hydrogen Generators

Hydrogen

GENERATORS

Description: Airgas fuel gas hydrogen generators utilize proton exchange membrane, which eliminates the use of liquid electrolytes with hydrogen generators.

Airgas generators are the most reliable hydrogen generators on the market. Maintenance requires only a few moments per year—no inconvenient, extended downtime. Simply change the filters every six months and the desiccant cartridge whenever it turns dark brown.

Deionized water is all that is required to generate hydrogen for weeks of continuous operation.

Automatic water filling is available for all fuel gas hydrogen generators.

Simply connect your in-house supply of deionized water to the nitrogen generator for virtually hands-free operation.

With an output capacity of up to 510 cc/minute, one generator can supply 99.9995% pure hydrogen for up to several FID's. Based on cylinder gas savings alone, a Airgas® hydrogen generator pays for itself in less than a year.

All Airgas hydrogen generators meet NFPA requirements and OSHA 1910.103 regulations governing the storage of hydrogen.

Produced and supported by an ISO 9001 registered organization, Airgas hydrogen generators are the first built to meet the toughest laboratory standards in the world: CSA, UL, CE and IEC 1010.



Design Features

- Ideal for fuel gas for up to 14 FID's
- Eliminates dangerous and expensive hydrogen gas cylinders from the laboratory
- Exclusive water management system and control circuitry maximize uptime
- Unique display lighting changes color for easy status checks and water level indication
- Remote control and remote monitoring capable by adding USB options bay controller
- Compact and reliable - only one square foot of bench space required
- Includes 2 year cell warranty
- No liquid caustics required

Equipment

Specifications				
Description	Y80-DS100	Y80-DS165	Y80-DS260	Y80-DS510
Purity	99.9995%	99.9995%	99.9995%	99.9995%
Flow Rates	100 cc/min	165 cc/min	260 cc/min	510 cc/min
Outlet Port	1/8" compression	1/8" compression	1/8" compression	1/8" compression
Electrical	100 Vac/230 Vac	100 Vac/230 Vac	100 Vac/230 Vac	100 Vac/230 Vac
Delivery Pressure	5-100 psig ± 0.5 psig	5-100 psig ± 0.5 psig	5-100 psig ± 0.5 psig	5-100 psig ± 0.5 psig
Shipping Weight	59 lb (27 kg) dry	59 lb (27 kg) dry	59 lb (27 kg) dry	59 lb (27 kg) dry
Dimensions	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)

Fuel Grade Hydrogen Generators Cont.

Hydrogen

GENERATORS

Ordering Information		
For technical support of this product call 1-800-939-5711 between 8 AM – 7 PM EST		
Type of Product	Product Number	Description
Dessicant Cartridge (1 each)	Y80-MKH2PEMD	Dessicant Cartridge for fuel grade generators 1 per kit
6 Month Service Kit	Y80-MKH2PEM6M	6 month Service kit for fuel grade generators
24 Month Service Kit	Y80-MKH2PEM24M	24 month Service kit for fuel grade generators
Preventive Maintenance Plan	Y80-H2PEM100PM	Preventive Maintenance Plan for Y80-DS100 generator
	Y80-H2PEM165PM	Preventive Maintenance Plan for Y80-DS165 generator
	Y80-H2PEM510PM	Preventive Maintenance Plan for Y80-DS510 generator
Installation Service	Y80-H2PEM100INST	Installation service to install one Y80-DS100 generator
	Y80-H2PEM165INST	Installation service to install one Y80-DS165 generator
	Y80-H2PEM260INST	Installation service to install one Y80-DS260 generator
	Y80-H2PEM510INST	Installation service to install one Y80-DS510 generator
USB Remote Control Accessory	Y80-604970894	USB Remote Control Accessory

GENERATORS

Zero Air

Chromatographic Zero Air



Description: Airgas® zero air generators produce a continuous flow of air from an existing compressed air supply. In conjunction with our hydrogen generators, these units help gas chromatographers automate GC-FID sampling with reliable, unattended gas supply.

Our zero air generators reduce the total hydrocarbon content (THC) to less than 0.1 ppm (measured as methane) and produce stable baselines for reproducible GC-FID analysis.

An inlet 0.5-micron coalescing filter removes particles, oil, and water from the air supply. Hydrocarbons are removed when the compressed air is passed over a converter containing a heated catalyst. After the air is cooled, a 0.01-micron cellulose filter removes any residual particles from the stream.

Specifications

Voltage	117 AC
Gas Characteristics	THC = < 0.1 ppm
Delivery Pressure Range	2-125 psig
Flow Rate	see ordering info
Dimensions (W x H x D)	6 3/4" x 12" x 15"
Weight	20 lbs

Design Features

Compact Design

requires just over one square foot of bench space.

Safe Operation

complies with all government regulatory safety standards, UL-CSA, and IEC 1010 approved.

High-Performance

yields optimum baseline performance for GC-FID analysis.

Ordering Information

Product Number	Flow Rate (cc/min)	
Y80-7583NA	1,000	
Y80-XA3500	3,500	
Y80-XA7000	7,000	
Y80-XA18	18,000	
Y80-XA30	30,000	
Y80-14000	14,000	
Y80-28000	280,000	

Available Options

Product Number	Description
Y80-1647731	Replacement Inlet Filter

FID Gas Station H₂/Air

FID

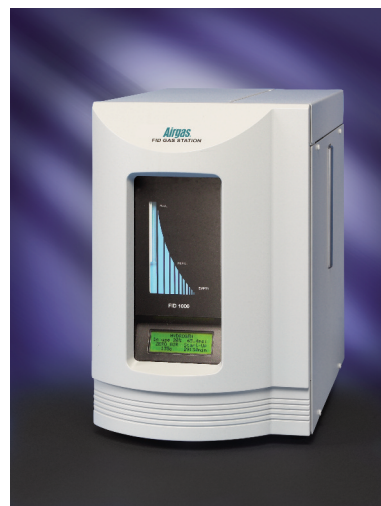
GENERATORS

Description: The Airgas® FID Gas Station provides both hydrogen gas and zero grade air for FID detectors on gas chromatographs. This system is specifically designed to provide fuel gas to 1-2 Flame Ionization Detectors and support Flame Thermionic and Photometric Detectors.

Hydrogen Technology: Hydrogen gas is produced from deionized water using a Proton Exchange Membrane Cell. The hydrogen generator utilizes the principle of electrolytic dissociation of water and hydrogen proton conduction through the membrane. The hydrogen supply produces 250 cc/min of UHP grade hydrogen with pressures up to 90 psig.

Zero Air Technology: Zero air is produced by purifying on-site compressed air to a total hydrocarbon concentration of less than 0.1 ppm (measured as methane). The generator produces up to 1000 cc/min of zero grade air.

Gas Generator Benefits: The Airgas Gas Station is a complete system with state-of-the-art, highly reliable components engineered for the easy installation, operation, and long-term performance. The Airgas® Gas Station eliminates the need for zero air and hydrogen cylinders. With the Airgas Gas Station Gas Generator, you control your gas supply. All Airgas gas generators meet NFPA 50A and OSHA 1910.103 regulations governing the storage of hydrogen.



Design Features

Produces UHP Zero Air

from house compressed air <0.1 ppm THC and 99.9995% pure hydrogen in one enclosure.

Increased Accuracy of Analysis

reduces cleaning requirements of the detector.

Recommended and used by many GC and column manufacturers.

Cost Effective

payback typically less than one year.

Automatic water fill standard

Silent operation and minimal operator attention required

Specifications for Hydrogen	
Max Outlet Air Pressure	0-90 psig
Flow Capacity	90 ccm
Product Purity	99.9995% pure hydrogen
Outlet	1/8" Compression
Electrical Requirements	120VAC/amp
Dimensions (HxWxD)	16.5" H x 10.5" W x 17" D (42cm x 27cm x 43cm)
Weight	46 Lbs. /21 kg

Specifications for Zero Air	
Min Inlet Pressure	40 psig
Max Outlet Air Pressure	40-125 psig
Flow Capacity	1,000 ccm/2,500 cc
Product Purity	< 0.1 ppm THC (measured as methane)
Outlet	1/8" Compression
Inlet	1/4" FNPT
Ambient Air Temperature	60° F to 90° F (16° C to 32° C)

Ordering Information

Product Number	Flow Capacity (cc/min)	
Y80-FID1000	90 H ₂ / 1000 Air	99.9995% (hydrogen) < 0.1 ppm THC
Y80-FID3500	250 H ₂ /3500 Air	99.9995% (hydrogen) < 0.1 ppm THC

Generator / Micro Bulk Back-up Panel

Description: The Airgas® 540 Series Generator / Micro Bulk Back-up Panel System is designed to provide a reserve supply to a gas generator / Micro Bulk or other critical gas supply system. If there is loss of electrical power or the generator cannot provide sufficient gas to the system, the reserve supply will automatically activate and supply gas without interruption. When the generator / Micro Bulk is capable of supplying the system again the reserve automatically shuts down. Panels are available for Nitrogen, Air, Hydrogen, and other inert gases. The panels will automatically supply a continuous supply of high purity, non-corrosive gas. The user can select at which pressure between 0-150 psig that they desire the system to engage. The pigtails are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves.

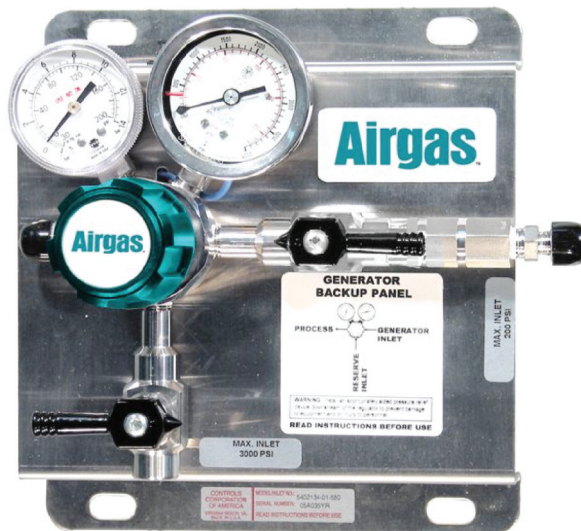
**There are high purity quarter turn diaphragm shut off and check valves on both the generator and reserve supply side to prevent backflow and allow isolation and disconnection of either line for service.

***Remote alarm models are available to notify users of low reserve pressure.

Specifications	
Maximum Rated Inlet Pressure	3000 PSIG
Maximum Outlet Pressure	0-150
Flow Capacity	Cv = 0.1
Ambient Operating Temperature	-40°F to 140°F (-38°C to 60°C)
Designed Leak Rate	1 x 10 ⁻⁹ scc/sec
Weight	6.5 lbs. Brass 7.25 lbs. Stainless Steel
Ports	1/4" FNPT
Inlet	1/4" Tube fitting (compression)
Outlet	1/4" Tube fitting (compression)
Gauge	2" diameter

540 Series

BACK-UP PANEL



Design Features

Available in Brass or Stainless Steel Models

Choice of high purity materials

Metal-to-metal diaphragm seal

No possibility of gas contamination

User-selectable activation pressure

Allows for nominal generator changes without use of reserve

Check valves on generator and reserve supply line and in CGA nipples

Prevents contamination and back flow

Quarter turn diaphragm valves on generator and reserve supply line

Allows for isolation and disconnection of either side for service

Materials

Body	Brass barstock, 316 Stainless Steel
Seat	PTFE
Diaphragm	316L Stainless Steel
Gauges	Brass, 316L Stainless Steel
Filter	10 micron Sintered Bronze or 316L Stainless Steel Mesh
Seals	Metal to metal diaphragm seal

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-GBP120(CGA)	2	Brass	3000	10-150	600	0-4000
Y11-GBP140(CGA)	4	Brass	3000	10-150	600	0-4000
Y11-GBP160(CGA)	6	Brass	3000	10-150	600	0-4000
Y11-GBP180(CGA)	8	Brass	3000	10-150	600	0-4000
Y11-GBP420(CGA)	2	316 Stainless Steel	3000	10-150	600	0-4000
Y11-GBP440(CGA)	4	316 Stainless Steel	3000	10-150	600	0-4000
Y11-GBP460(CGA)	6	316 Stainless Steel	3000	10-150	600	0-4000
Y11-GBP480(CGA)	8	316 Stainless Steel	3000	10-150	600	0-4000

*Other configurations available upon request.

Available Options

Product Number	Description
Y99-4CYLRACK	4 Cylinder Rack
Y78-820ALPK*	Non-Flammable Alarm Package

Remote Alarm Capability: Must be ordered at time of original order

Flammable Gas Service Provided with Intrinsic Safety Barriers to ensure safe operation

*Alarm Systems available by special request. Call 1-800-939-5711 for pricing.

GENERATORS

Zero Air



TOC-1250 Air

Description: The Airgas® Zero Air TOC-1250 Gas Generator produces carrier/combustion gas, from an existing compressed air supply, for TOC instruments, eliminating the need for high pressure cylinders of air, nitrogen, or oxygen.

The Airgas Zero Air TOC-1250 Gas Generator utilizes catalytic oxidation and pressure swing absorption technologies to remove hydrocarbons to 0.1 ppm, and water vapor to 1 ppm (-100° F/-73° C dewpoint).

The TOC-1250 Gas Generator is a complete system with carefully matched components engineered for easy installation, operation, and long-term reliability. Installation consists of connecting the outlet to the TOC gas supply line. Plug the generator into a standard electrical wall outlet and within minutes high purity carrier/combustion gas is supplied.

Specifications

Inlet Pressure Range	65–125 psig
Max Outlet Pressure	100 psig
Flow Capacity	1.25 lpm (1,250 ccm)
Outlet Hydrocarbon Concentration (as methane)	0.1 ppm
Outlet CO ₂ Concentration	< 1 ppm
Flow Capacity	1.25 lpm (1,250 ccm)
Dewpoint	<-100° F (-73° C)
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Min Required Inlet Air Flow at 100 psig	2.5 lpm (2,500 ccm)
Max Inlet Hydrocarbon Concentration (as methane)	100 ppm
Pressure Drop at Maximum Flow Rate	7 psig
Warm-up Time	40 minutes
Power Requirement	120VAC/60 Hz, 2.0 Amps.
Dimensions (WxHxD)	11" W x 17" H x 17" D (28 cm x 43 cm x 43 cm)
Weight	48 lbs. (22 kg)

Design Features

Replaces High-Pressure Oxygen or Nitrogen Gas Cylinders
hydrocarbon-free, CO₂-free compressed gas for TOC Analyzers.

Ensures Consistent, Reliable, TOC Operation
significantly reduces instrument service and maintenance costs.

Compact Design
frees up valuable laboratory floor space.

High-Purity Carrier/Combustion Gas within Minutes
meets or exceeds all TOC manufacturers' gas purity requirement.

Ordering Information

Product Number	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Flow Rate (ccm)	Inlet Gauge Range (psig)
Y80-TOC1250	125	100	1,250	65–125

Available Options

Product Number	Description
Y80-MK7840	Annual Maintenance Kit
Y80-LK76803	Installation Kit

FT-IR Purge Gas

Description: The Airgas® FT-IR Purge Gas Generator is specifically designed for use with FT-IR Spectrometers to provide a purified purge gas and air bearing gas from compressed air. The Generators supply carbon dioxide-free air at less than -100° F (-73° C) dew point with no suspended impurities larger than 0.01 µm. The units are designed to operate continuously 24 hours/day, 7 days/week. The Airgas® FT-IR Purge Gas Generator eliminates the need for nitrogen cylinders and dewars, and significantly reduces the costs of operating all FT-IR instrumentation. Each system offers cleaner background spectra in a shorter period of time and more accurate analysis by improving the signal-to-noise ratio. The typical payback period is less than one year. The Generators are also ideally suited for use with CO₂ Analyzers in addition to supplying other laboratory instruments.

Each Generator is quiet, reliable, and easy to install - simply attach the inlet air and outlet purge lines, plug the power cord into a wall outlet, and enjoy trouble-free operation.

FT-IR Purge Gas Generators

GENERATORS



The Airgas® Self Contained FT-IR Purge Gas Generator includes a state-of-the-art compressor on Model Y80-745041NA.

Design Features

Improve Instrument Accuracy, Sensitivity, and Performance
system offers cleaner background Spectra.

State-of-the-Art

includes oil-less compressor (on Model Y80-745041NA) only.

Safe and Trouble-Free

reliable, easy to install and operates at low pressure.

Cost Effective

payback typically less than one year.

Compact Design

frees up valuable laboratory floor space.

Ordering Information

Product Number	Flow Capacity (lpm/lpm)	Max Outlet Pressure (psig)
Y80-7545NA	9 lpm/ 17 lpm	125
Y80-7552NA	17 lpm/ 34 lpm	125
Y80-7562NA	57 lpm/ 102 lpm	125
Y80-745041NA	28 lpm	80

Specifications

Inlet Air Pressure Range	60–125 psig								
Max Outlet Air Pressure 7545NA, 7552NA, 7562NA 745041NA	125 psig 80 psig								
Flow Rate for Specified Dew Point	<table> <tr> <td>7545NA</td><td>36 scfh (17 lpm) Inlet Pressure 125 psig 18 scfh (9 lpm) Inlet Pressure 60 psig</td></tr> <tr> <td>7552NA</td><td>72 scfh (34 lpm) Inlet Pressure 125 psig 36 scfh (17 lpm) Inlet Pressure 60 psig</td></tr> <tr> <td>7562NA</td><td>216 scfh (102 lpm) Inlet Pressure 125 psig 120 scfh (57 lpm) Inlet Pressure 60 psig</td></tr> <tr> <td>745041NA</td><td>60 scfh (28 lpm) Max Flow Rate at 80 psig</td></tr> </table>	7545NA	36 scfh (17 lpm) Inlet Pressure 125 psig 18 scfh (9 lpm) Inlet Pressure 60 psig	7552NA	72 scfh (34 lpm) Inlet Pressure 125 psig 36 scfh (17 lpm) Inlet Pressure 60 psig	7562NA	216 scfh (102 lpm) Inlet Pressure 125 psig 120 scfh (57 lpm) Inlet Pressure 60 psig	745041NA	60 scfh (28 lpm) Max Flow Rate at 80 psig
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745041NA	60 scfh (28 lpm) Max Flow Rate at 80 psig								
CO ₂ Concentration	< 1 ppm								
Dew Point Down To	-100° F (-73° C)*								
Max Inlet Air Temperature (1) 7545NA, 7552NA, 7562NA 745041NA (Ambient)	78° F (25° C) 90° F (32° C)								
Air Consumption for regeneration (2) 7545NA 7552NA 7562NA 745041NA	30 scfh (14 lpm) 60 scfh (28 lpm) 120 scfh (57 lpm) N/A								
Nitrogen Outlet Port	1/4" FNPT								
Electrical Requirements	120V/60Hz								
Dimensions (HxWxD)	<table> <tr> <td>7545NA</td><td>13" H x 7" W x 6" D (33cm x 18cm x 15cm)</td></tr> <tr> <td>7552NA</td><td>28" H x 13" W x 9" D (71cm x 32cm x 23cm)</td></tr> <tr> <td>7562NA</td><td>42" H x 13" W x 9" D (71cm x 32cm x 23cm)</td></tr> <tr> <td>745041NA</td><td>31" H x 18" W x 32" D (76cm x 46cm x 81cm)</td></tr> </table>	7545NA	13" H x 7" W x 6" D (33cm x 18cm x 15cm)	7552NA	28" H x 13" W x 9" D (71cm x 32cm x 23cm)	7562NA	42" H x 13" W x 9" D (71cm x 32cm x 23cm)	745041NA	31" H x 18" W x 32" D (76cm x 46cm x 81cm)
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Weight	<table> <tr> <td>7545NA</td><td>25 lbs (11kg)</td></tr> <tr> <td>7552NA</td><td>40 lbs (20kg)</td></tr> <tr> <td>7562NA</td><td>80 lbs (36kg)</td></tr> <tr> <td>745041NA</td><td>250 lbs (114kg)</td></tr> </table>	7545NA	25 lbs (11kg)	7552NA	40 lbs (20kg)	7562NA	80 lbs (36kg)	745041NA	250 lbs (114kg)
7545NA	25 lbs (11kg)								
7552NA	40 lbs (20kg)								
7562NA	80 lbs (36kg)								
745041NA	250 lbs (114kg)								

*at atmospheric pressure

Engineering the Right Solutions



NitroFlow Lab Self Contained LC/MS Membrane Nitrogen Generator

Description: The Airgas® LC/MS NitroFlow Lab is a self-contained membrane nitrogen generator that produces LC/MS-grade nitrogen with output pressure to 116 psig. Nitrogen is produced by utilizing a combination of compressors, carefully matched with filtration, and membrane separation technology components.

Intake ambient air from the laboratory is filtered using an inlet suction breather filter to remove airborne organic and particulate impurities. This purified air is delivered to a long-life, low-pressure air compressor which provides an air stream to hollow fiber membranes which subsequently separate the clean air into a concentrated nitrogen retentate and oxygen enriched permeate, which is then cycled through the system. Prior to exiting the system pure nitrogen retentate is delivered to a nitrogen amplification compressor to assure proper pressure, flow and purity to the LC/MS.

The Airgas LC/MS NitroFlow Lab will deliver a continuous or on-demand supply of pure nitrogen, making it the smart alternative to cylinders. Superior engineering with carefully matched filtration, membrane separation and compression technologies have resulted in a system with the utmost reliability and longevity. Additional applications include: nebulizer gases, chemical and solvent evaporation, instrument supply and purge, evaporative light scattering equipment and sparging.

Design Features

- Flow capacity to 30 LPM
- Less expensive and more convenient than nitrogen cylinders and dewars
- Ideal for all derivatives of ESI and APCI modes
- Includes state-of-the-art, oil-less compressors
- Unlike PSA and Hosmer technologies, membrane will not suppress corona needle discharge
- Special sound insulation design ensures quiet operation

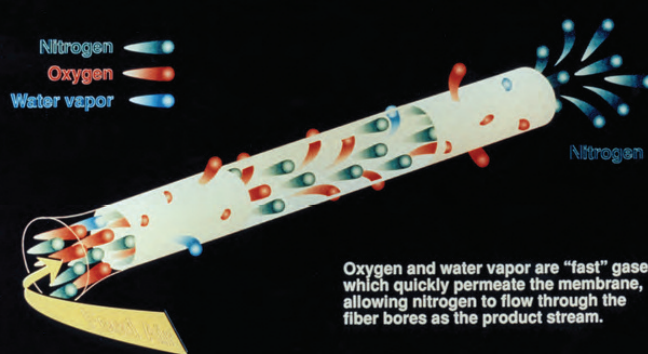
NitroFlowLab

GENERATORS



Principal Specifications	
Model	NitroFlowLab
Nitrogen	Phthalate free with flow to 30 lpm @ sea level
Maximum Outlet Pressure	116 psig (8 barg)
Hydrocarbon Content	< 2ppm (excluding methane)
Atmospheric Dewpoint	-58°F (-50°C)
Outlet Port Female	1/4" NPT
Min/Max Ambient Temperature	50°F/95°F (10°C/35°C)
Electrical Requirements	120Vac/60Hz/20Amp / NEMA 5 - 20 Straight Blade
Dimensions	27.6"h x 12.2"w x 35.4"d (70.1cm x 31cm x 90cm)
Shipping Weight	204 lbs. (92.5 kg)

Membrane Technology



Ordering Information

Product Number	Flow Rate (lpm)	Max Outlet Pressure	Purity
Y80-NITROFLOWLAB	30	116 psig	99.00%

Nitrogen Generators for LC/MS

Electrical-Heated Regulator

PRESSURE REGULATOR

Flow Capacities up to 60 lpm Nitrogen On Demand, Up to 60 slpm

Description: The Airgas NitroFlow 60 is a self contained generator that produces up to 60 slpm of pure LC/MS grade nitrogen at pressures of up to 110 psig. Nitrogen is produced utilizing a combination of a scroll compressor and nitrogen membrane separation technologies. This combination of technologies yields the highest performing, most reliable and quietest integrated nitrogen generation system available.

The NitroFlow 60 is also available with an integrated membrane dryer for use with instruments that require dry air, including the chip cube interface from Agilent Technologies.

Typical applications include LC/MS, nebulizer gases for APCI and ESI, Jet Stream, I Funnel, ELSD, Turbo Vaps and chemical solvent evaporation.



Proven Technology

The unique combination of a rotary scroll compressor and high efficiency membrane ensures that the NitroFlow 60 has many unique advantages over all other existing LC/MS nitrogen generators. Rotary scroll compressors operate at low temperatures, have less moving parts and are significantly quieter than piston compressors used by other Nitrogen Generator manufacturers.

The safe, convenient and cost effective method of providing high purity nitrogen for your LC/MS

Design Features

- Complete “plug and play” system recommended for all major LC/MS instruments
- Phthalate-free, no organic vapors
- Produces a continuous supply of nitrogen for all LC/MS applications
- Eliminate dangerous nitrogen cylinders from the laboratory
- Nearly silent operation; operates at less than 49 dB(A)

Specifications	NitroFlow 60	NitroFlow 60D
Nitrogen	Up to 60 slpm	Up to 60 slpm
Dry Air Flow	N/A	5 slpm
Dry Air Dewpoint	N/A	-40°F (-40°C)
Hydrocarbon Free	Yes	Yes
Phthalate Free	Yes	Yes
Maximum Outlet Pressure	100 psig	100 psig
Atmospheric Dewpoint	-58°F (-50°C)	-58°F (-50°C)
Outlet Port	Female 1/4" NPT	Female 1/4" NPT
Min/Max Ambient Temperature	50°F/95°F (10°C/35°C)	50°F/95°F (10°C/35°C)
Electrical Requirements	230 VAC, 60 Hz, 1 Phase, 14A*† 230 VAC, 50 Hz, 1 Phase, 13A*†	195-254 VAC, 60 Hz, 1 Phase, 14A* 230 VAC, 50 Hz, 1 Phase, 13A*
Dimensions	43"H x 21"W x 34"D (109cm H x 53cm W x 86cm D)	43"H x 21"W x 34"D (109cm H x 53cm W x 86cm D)
Shipping Weight	643 lbs. (292 kg)	643 lbs. (292 kg)

*During operation, 30A at startup

†Main supply voltage fluctuations not to exceed +10%/-15% of nominal voltage.

Ordering Information for assistance, please call 1-800-343-4048 8AM to 5PM Eastern Standard Time

Model Number	Description
Y80-NITROFLOW60	Nitrogen Generator with Integrated Compressor
Y80-NITROFLOW60D	Nitrogen Generator with Dryer Option and Integrated Compressor

SOURCE LC/MS TriGas Generator Series

Model LCMS-5000NA

GENERATORS

Description: The Airgas® SOURCE LCMS-5000NA TriGas Generator is a completely engineered system designed to deliver pure nitrogen for curtain gas, pure zero grade air as gas-1/gas-2 source gases and dry - 40°F dew point air as source exhaust. The system is designed to produce gases which meet and exceed the requirements of any LC/MS requiring three independent gases. The system consists of six functional technologies: Coalescing pre-filtration with timed solenoid drains, self regenerating compressed air dehydration membranes, a proprietary heated catalysis module, elegant self-regenerating nitrogen retentate membranes, high capacity - high sensitivity carbon absorption modules and carefully matched final filtration membrane media. These technologies are integrated to a reliable scroll compressor.

The Airgas SOURCE LCMS-5000NA TriGas Generator will provide enough gas for a single LC/MS instrument on a continual basis.



The generator can be connected easily, be located in the lab, and features independent stainless steel output gas ports carefully matched to the instrument.

With a Airgas SOURCE LCMS-5000NA TriGas Generator, you control all your LC/MS gas supplies.

Design Features

- Generates pure nitrogen, zero air and source exhaust air from compressed air
- Prevents running out of gases during LC/MS instrument operation
- Preserves valuable laboratory space and maximizes LC/MS instrument uptime
- Reliable scroll compressor, quiet 49 dB(A) operation at a safe, low pressure
- Gas purity to 99.999% and no phthalates
- Turnkey system that eliminates stainless steel regulators and gas distribution panels
- Supplies pure nitrogen, zero grade air and source exhaust air
- Produced and manufactured by an ISO 9001 registered organization
- Operates continuously 24 hours a day, 7 days a week
- Minimal annual maintenance
- Easy installation and whisper quiet operation
- Floor standing on movable casters
- Listed to U.S. & Canadian safety standards
- Carries CE Marking/Compliant to WEEE standard

Principal Specifications

Model	LCMS-5000NA
Curtain gas (nitrogen)	to 10 lpm and 80 psi
Source gas (uhp zero grade air)	to 23 lpm and 110 psi
Exhaust gas (dry air)	to 8 lpm and 60 psi
Compressor included	Yes - Scroll
Atmospheric dewpoint	-40°F
Hydrocarbons	<0.1 ppm measured as methane
Particles > 0.01 micron	None
Phthalates	None
Suspended liquids	None
Outlets	1/4" tube - stainless steel - 3 each
Dimensions	26"D x 45"W x 43"H
Pressure gauges	3 each
Electrical requirements	120vac, 60Hz, 15 amp and 230vac, 60Hz, 3 amp*
Noise level	< 49 dB(A)
Weight	564 lbs. (256 kgs)

*Please call 1-800-939-5711 for voltage and plug configurations outside North America.

Ordering Information

Product Number	Description
Y80-LCMS5000NAPM	Source LC/MS Trigas Generator
Y80-IKLCMS5000	Installation Kit
Y80-LCMS5000NAPM	Preventive Maintenance Plan
Y80-A030194	Voltage Booster
Y80-114001 (specify length)	3/8" Plastic Tubing for Remote Compressor Use

SOURCE LC/MS TriGas Generator Series

Model LCMS-5001NTNA

GENERATORS

Description: The Airgas® SOURCE LCMS TriGas Generator is a completely engineered system designed to transform ordinary compressed air into pure nitrogen for curtain gas, pure zero grade air as gas-1/gas-2 source gases and dry -40°F dew point air as source exhaust. The system is designed to produce gases which meet and exceed the requirements of any LC/MS requiring three independent gases. The system consists of six functional technologies: Coalescing pre-filtration with timed solenoid drains, self regenerating compressed air dehydration membranes, a proprietary heated catalysis module, elegant selfregenerating nitrogen retentate membranes, high capacity - high sensitivity carbon absorption modules and carefully matched final filtration membrane media.

The Airgas SOURCE LCMS TriGas Generator will provide enough gas for a single LC/MS instrument on a continual basis. The generator can connect easily to



an existing compressed air supply line and features independent stainless steel output gas ports carefully matched to the instrument.

With a Airgas SOURCE LCMS TriGas Generator, you control all your LC/MS gas supplies.

Design Features

- Generates pure nitrogen, zero air and source exhaust air from compressed air
- Prevents running out of gases during LC/MS instrument operation
- Preserves valuable laboratory space and maximizes LC/MS instrument uptime
- Reliable, silent operation at a safe, low pressure
- Gas purity to 99.999% and no Phthalates
- Turnkey system that eliminates stainless steel regulators and gas distribution panels
- Supplies pure nitrogen, zero grade air and source exhaust air
- Produced and manufactured by an ISO 9001 registered organization
- Operates continuously 24 hours a day, 7 days a week
- Minimal annual maintenance
- Easy installation and silent operation
- Floor standing
- Listed to U.S. & Canadian safety standards
- Carries CE Marking/Compliant to WEEE standard

Principal Specifications

Model	LCMS-5001NTNA
Curtain gas (nitrogen)	to 10 lpm and 80 psi
Source gas (uhp zero grade air)	to 23 lpm and 110 psi
Exhaust gas (dry air)	to 8 lpm and 60 psi
Air pressure required	85-145 psi (> 100 psi suggested)
Pressure dewpoint	-40°F
Hydrocarbons	<0.1 ppm measured as methane
Particles	> 0.01 micron None
Phthalates	None
Suspended Liquids	None
Inlet	3/8" tube (presto)
Outlets	1/4" tube - stainless steel - 3 each
Dimensions	16"D x 23"W x 41"H
Pressure gauges	3 each
Electrical requirements	20vac, 60Hz, 3 amp*
Noise	Silent operation
Weight	110 lbs. (50 kgs)

*Please call 1-800-939-5711 for voltage and plug configurations outside North America.

Ordering Information

Model	Description
Y80-LCMS5001NTNA	Source LC/MS Trigas Generator
Y80-IKLCMS5000	Installation Kit
Y80-LCMS5001NTNAPM	Preventive Maintenance Plan
Y80-LCMS5001NTDN2	Extended Support with 24 Month Warranty

SOURCE LC/MS TriGas Generator Series

Model LCMS-5001TNA

GENERATORS

Description: The Airgas® SOURCE LCMS TriGas Generator is a completely engineered system designed to transform ordinary compressed air into pure nitrogen for curtain gas, pure zero grade air as gas-1/gas-2 source gases and dry -40°F dew point air as source exhaust. The system is designed to produce gases which meet and exceed the requirements of any LC/MS requiring three independent gases. The system consists of six functional technologies: Coalescing pre-filtration with timed solenoid drains, self regenerating compressed air dehydration membranes, a proprietary heated catalysis module, elegant selfregenerating nitrogen retentate membranes, high capacity - high sensitivity carbon absorption modules and carefully matched final filtration membrane media.

The Airgas SOURCE LCMS TriGas Generator will provide enough gas for a single LC/MS instrument on a continual basis.

The generator can connect easily to an existing compressed air supply line and features independent stain-



less steel output gas ports carefully matched to the instrument. Gas distribution, pressure and flow control are integral to each TriGas generator.

With a Airgas SOURCE LCMS TriGas Generator, you control all your LC/MS gas supplies.

Design Features

- Generates pure nitrogen, zero air and source exhaust air from compressed air
- Prevents running out of gases during LC/MS instrument operation
- Preserves valuable laboratory space and maximizes LC/MS instrument uptime
- Reliable, silent operation at a safe, low pressure
- Gas purity to 99.999% and no Phthalates
- Turnkey system that eliminates stainless steel regulators and gas distribution panels
- Supplies pure nitrogen, zero grade air and source exhaust air
- Produced and manufactured by an ISO 9001 registered organization
- Operates continuously 24 hours a day, 7 days a week
- Minimal annual maintenance
- Easy installation and silent operation
- Floor standing, includes internal economizer air receiver system
- Listed to U.S. & Canadian safety standards
- Carries CE Marking/Compliant to WEEE standard

Principal Specifications

Curtain gas (nitrogen)	to 10 lpm and 80 psi
Source gas (uhp zero grade air)	to 23 lpm and 110 psi
Exhaust gas (dry air)	to 8 lpm and 60 psi
Air pressure required	85-145 psi (>100 psi suggested)
Pressure dewpoint	-40°F
Hydrocarbons	<0.1 ppm measured as methane
Particles	> 0.01 micron None
Phthalates	None
Suspended Liquids	None
Inlet	3/8" tubing (presto)
Outlets	1/4" tube - stainless steel - 3 each
Dimensions	25"D x 20"W x 43"H
Pressure gauges	3 each
Electrical requirements	120vac, 60Hz, 3 amp*
Noise	Silent operation
Weight	224 lbs (102 kgs)

*Please call 1-800-939-5711 for voltage and plug configurations outside North America.

Ordering Information

Model	Description
Y80-LCMS5001TNA	Source Trigas Generator
Y80-IKLCMS5000	Installation Kit
Y80-LCMS5001TNAPM	Preventive Maintenance Plan
Y80-LCMS5001TDN2	Extended Support with 24 Month Warranty

NitroFlow Lab Self Contained LC/MS Membrane Nitrogen Generator

Description: The Airgas® LC/MS NitroFlow Lab is a self-contained membrane nitrogen generator that produces LC/MS-grade nitrogen with output pressure to 116 psig. Nitrogen is produced by utilizing a combination of compressors, carefully matched with filtration, and membrane separation technology components.

Intake ambient air from the laboratory is filtered using an inlet suction breather filter to remove airborne organic and particulate impurities. This purified air is delivered to a long-life, low-pressure air compressor which provides an air stream to hollow fiber membranes which subsequently separate the clean air into a concentrated nitrogen retentate and oxygen enriched permeate, which is then cycled through the system. Prior to exiting the system pure nitrogen retentate is delivered to a nitrogen amplification compressor to assure proper pressure, flow and purity to the LC/MS.

The Airgas LC/MS NitroFlow Lab will deliver a continuous or on-demand supply of pure nitrogen, making it the smart alternative to cylinders. Superior engineering with carefully matched filtration, membrane separation and compression technologies have resulted in a system with the utmost reliability and longevity. Additional applications include: nebulizer gases, chemical and solvent evaporation, instrument supply and purge, evaporative light scattering equipment and sparging.

Design Features

- Flow capacity to 30 LPM
- Less expensive and more convenient than nitrogen cylinders and dewars
- Ideal for all derivatives of ESI and APCI modes
- Includes state-of-the-art, oil-less compressors
- Unlike PSA and Hosmer technologies, membrane will not suppress corona needle discharge
- Special sound insulation design ensures quiet operation

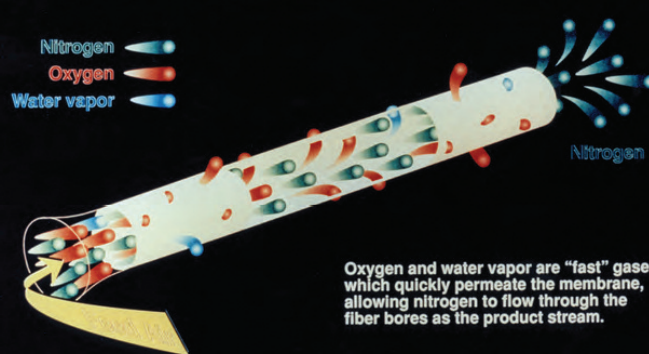
NitroFlowLab

GENERATORS



Principal Specifications	
Model	NitroFlowLab
Nitrogen	Phthalate free with flow to 30 lpm @ sea level
Maximum Outlet Pressure	116 psig (8 barg)
Hydrocarbon Content	< 2ppm (excluding methane)
Atmospheric Dewpoint	-58°F (-50°C)
Outlet Port Female	1/4" NPT
Min/Max Ambient Temperature	50°F/95°F (10°C/35°C)
Electrical Requirements	120Vac/60Hz/20Amp / NEMA 5 - 20 Straight Blade
Dimensions	27.6"h x 12.2"w x 35.4"d (70.1cm x 31cm x 90cm)
Shipping Weight	204 lbs. (92.5 kg)

Membrane Technology



Ordering Information

Product Number	Flow Rate (lpm)	Max Outlet Pressure	Purity
Y80-NITROFLOWLAB	30	116 psig	99.00%

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

High-Purity Models

Description: The Airgas® Models Y80-HPN21100, Y80-UHPN21100, Y80-HPN22000, Y80-7697NA and Y80-7698NA Nitrogen Generators have been designed specifically to produce up to 12.0 lpm of ultra-high-purity nitrogen gas. These systems are completely engineered to transform standard compressed air into 99.99% or 99.9999% nitrogen, matching the specifications of UHP cylinder gas.

Nitrogen is produced utilizing a combination of state-of-the-art purification technologies and high-efficiency filtration. Pressure swing absorption is utilized for the removal of O₂, CO₂, and water vapor. A catalyst module is incorporated in Models Y80-UHPN21100 and Y80-7698NA to oxidize hydrocarbons from the inlet air supply.

Airgas® Nitrogen Generators are engineered and packaged in a small cabinet to fit on or beneath any benchtop. The Airgas® Model Y80-7692NA and Y80-7694NA are ideal for carrier gas applications. The Airgas® Models Y80-7697NA and Y80-7698NA are ideal for purging ICP's.

Nitrogen

GENERATORS



Design Features

Compact Design

frees up valuable laboratory floor space.

Use for Variety of Disciplines

Gas Chromatography, LC/MS, ICP and thermal analysis.

Eliminates Inconvenience

no need for nitrogen cylinders or dewars in the laboratory.

High Efficiency Coalescing Prefilters

0.01 micron (absolute) membrane filter incorporated into each design.

Long Term Cost Stability

price increases, contract negotiations, long term commitments or tank rental no longer a concern.

Specifications

Inlet Pressure Range	60–120 psig
Outlet Pressure Range	35–85 psig
Flow Capacity ccm	0–1,100; 0–2,000; 0–12,000
Power Requirement	110VAc
Dimensions (WxHxD)	UHPN21100, HPN22000: 12" W x 16" D x 35" 7697, 7698: 25" W x 25" D x 41" H
Weight	UHPN21100, HPN22000: 115 lbs 7697, 7698: 500 lbs

Ordering Information

Product Number	Flow Rate (cc/min.)	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Purity
Y80-HPN21100	1,100	125	85	99.9999%
Y80-HPN21100	1,000	110	75	99.9999%
Y80-HPN21100	900	100	65	99.9999%
Y80-HPN21100	800	90	60	99.9999%
Y80-HPN21100	700	80	50	99.9999%
Y80-HPN21100	600	70	45	99.9999%
Y80-HPN21100	500	60	35	99.9999%
Y80-UHPN21100	1,100	125	85	99.9999%
Y80-UHPN21100	1,000	110	75	99.9999%
Y80-UHPN21100	900	100	65	99.9999%
Y80-UHPN21100	800	90	60	99.9999%
Y80-UHPN21100	700	80	50	99.9999%
Y80-UHPN21100	600	70	45	99.9999%
Y80-UHPN21100	500	60	35	99.9999%
Y80-HPN22000	2,000	75–120	90	99.9999%
Y80-7697NA	12,000	60–120	75	99.9999%
Y80-7698NA	12,000	60–120	83	99.9999%

Available Options

Product Number	Description
Y80-438027	Prefilters

GENERATORS

Nitrogen

Flows to 72 LPM



Description: The Airgas® Y80-N214 and Y80-N222 Membrane Nitrogen Gas Generators produce up to 72 slpm of compressed nitrogen on-site. The purity level of the nitrogen is defined by the user for the application and may range from 95% to 99.95%. The generator can also be used for solvent evaporation as well as supplying dry nitrogen to analytical instruments.

Airgas® Membrane Nitrogen Gas Generators are complete systems engineered to transform standard compressed air into nitrogen at safe, regulated pressures on demand without the need for operator attention. These systems eliminate the need for dewars and cylinders in the laboratory.

Utilizing a combination of filtration and membrane separation technologies produces nitrogen. A high-efficiency prefiltration system pretreats the compressed air to remove all

contaminants down to 0.10 micron. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen output stream and oxygen enriched permeate stream which is vented from the system. The combination of these technologies produces a continuous on-demand supply of pure nitrogen. Typical application include: nebulizer gas, chemical and solvent evaporation, instrument purge and supply, evaporative light scattering detector use (HPLC), and sparging.

Design Features

Membrane Separator Technology

requires minimal maintenance.

No Electricity Required

periodic prefilter changeout is only maintenance.

Paybacks

6 months to 2 years.

Enhanced Instrument Performance

due to LC/MS grade purity of nitrogen.

Recommended, Certified, and Used by all Major LC/MS Instrument Manufacturers

Nitrogen Purity / Flow Chart

Flow measured in slpm at indicated operating pressure psig. Flows for Y80-N222 are noted with an asterisk*

Purity % N ₂	145	*	125	*	110	*	100	*	90	*	80	*	70	*	60	*
99.95	8	16	7	14	6	12	5	10	4	8	8	6	2	4	1	2
99	14	28	12	24	10	20	9	18	8	16	6	12	5	10	4	8
98	20	40	17	34	14	28	13	26	11	22	9	18	7	14	6	12
97	24	48	20	40	17	34	16	32	13	26	11	22	9	18	7	14
96	29	58	25	50	22	44	19	38	16	32	14	28	11	22	8	16
95	36	72	31	62	27	54	24	48	21	42	17	34	13	26	11	22

Specifications

Max Inlet Air Pressure	145 psig
Min. Inlet Air Pressure	60 psig
Rec. Ambient Operating Temperature	≤ 68° F (25° C)
Max Ambient Air Temperature	110° F (34° C)
Nitrogen Outlet	1/4" FNPT
Nitrogen Product Pressure	60–100 psig
Suspended Liquids	None
Particles > 0.01 µm	None
Commercially Sterile	Yes
Atmospheric Dew Point Down To	-58° F (-50° C)
Electrical Requirements	
	N214/N222
	N214A/N222A
	120 VAC/60 Hz/25 Watts
Dimensions (WxHxD)	N214/N222
	50" W x 16" H x 16" D (127cm x 40cm x 40cm)
Weight	N214
	N214A
	N222
	N222A
	75 lbs. (34 kg)
	80 lbs. (36 kg)
	101 lbs. (46 kg)
	106 lbs (48 kg)

Flows to 72 LPM Cont.

Nitrogen

GENERATORS

Ordering Information						
Product Number	Flow Ranges (LPM)	O ₂ Analyzer	Max. Inlet Pressure (psig)	Min. Inlet Pressure (psig)	Max. Pressure Drop (@ 99% N ₂ Purity, 125 psi)	Nitrogen Purity
Y80-N214	8–36	No	145	80	10 psi	99.95%
Y80-N222	16–72	No	145	80	10 psi	99.95%
Y80-N214A	8–36	Yes	145	80	10 psi	99.95%
Y80-N222A	16–72	Yes	145	80	10 psi	99.95%

	Available Options	
	Product Number	Description
	Y80-438027	Prefilters
	Y80-IK572	Installation Kit for all models

Flows to 557 LPM

Nitrogen

GENERATORS

Description: These Airgas® Membrane Nitrogen Generators Y80-N245, Y80-N280 and Y80-N2135 are designed to supply single or multiple LC/MS instruments with dry nitrogen at purities of 99% to 99.95%. The generator can also be used for solvent evaporation as well as supplying dry nitrogen to analytical instruments.

Installation requires a minimum of 60 psig of compressed air to a 1/4" or 1/2" inlet connection. The outlet nitrogen supply is then directed to your analytical instruments. No electrical connections are required for the Y80-N245 and the Y80-N2135 and the only maintenance is to change prefilters periodically.

Airgas® Membrane Nitrogen Generators are recommended and used by virtually all major LC/MS instrument manufacturers. Their compact design frees up valuable laboratory floor space. And, unlike PSA and Hosmer technologies, the membrane will not suppress coronal needle discharge. Paybacks on the nitrogen systems typically range from six months up to two years. Applications include: LC/MS, solvent evaporation and analytical instruments requiring nitrogen. The Airgas® Membrane Nitrogen Generators are also available with purity monitors.



Design Features

Membrane Separator Technology
requires minimal maintenance.

No Electricity Required
periodic prefilter changeout is only maintenance.

Paybacks
6 months to 2 years.

Enhanced Instrument Performance
due to LC/MS grade purity of nitrogen.

Recommended, Certified, and Used by all Major LC/MS Instrument Manufacturers

Nitrogen Purity / Flow Chart

Flow lpm (liters per minute), at 68° F (25° C) inlet air temperature and operating pressure, psig.
Flows for Y80-N280 are noted with a straight underline.
Flows for Y80-N2135 are noted with a wavy underline.

Purity % N ₂	145 psig			125 psig			110 psig			100 psig			90 psig			80 psig		
99.95	37	70	104	32	61	<u>90</u>	26	<u>52</u>	<u>85</u>	23	<u>47</u>	<u>76</u>	20	<u>38</u>	<u>61</u>	16	<u>28</u>	<u>52</u>
99	62	124	<u>151</u>	52	104	<u>142</u>	42	<u>84</u>	<u>123</u>	38	<u>76</u>	<u>113</u>	31	<u>62</u>	<u>90</u>	28	<u>56</u>	<u>80</u>
98	98	<u>196</u>	<u>236</u>	84	<u>168</u>	<u>222</u>	73	<u>146</u>	<u>193</u>	66	<u>132</u>	<u>179</u>	56	<u>112</u>	<u>142</u>	45	<u>90</u>	<u>123</u>
97	133	<u>266</u>	<u>312</u>	114	<u>228</u>	<u>288</u>	99	<u>198</u>	<u>260</u>	89	<u>178</u>	<u>236</u>	76	<u>152</u>	<u>189</u>	60	<u>120</u>	<u>165</u>
96	168	<u>336</u>	<u>425</u>	143	<u>286</u>	<u>387</u>	125	<u>250</u>	<u>345</u>	112	<u>224</u>	<u>312</u>	95	<u>190</u>	<u>250</u>	76	<u>152</u>	<u>217</u>
95	205	<u>410</u>	<u>557</u>	176	<u>352</u>	<u>463</u>	153	<u>306</u>	<u>411</u>	137	<u>274</u>	<u>373</u>	116	<u>232</u>	<u>297</u>	92	<u>184</u>	<u>260</u>

Specifications

Min/Max Inlet Air Pressure	80–145 psig
Rec. Ambient Operating Temperature	≤68° F (25° C)
Max Ambient Air Temperature	1200° F (50° C)
Nitrogen Outlet	1/4" FNPT
Nitrogen Product Pressure	60–100 psig
Commercially Sterile	Yes
Particles > 0.01 µm	None
Suspended Liquids	None
Atmospheric Dew Point Down to	-58° F (-50° C)
Electrical Requirements*	<div>N245</div> <div>N280</div> <div>N2135</div> <div>none</div> <div>120VAC/60Hz</div> <div>none</div>
Dimensions (WxHxD)	24" W x 20" D x 67" H (61 cm x 51 cm x 170 cm)
Weight	250 lbs (114 kg)

*No electrical power required for the Y80-N245 unless used with an electrical accessory e.g. an oxygen analyzer. 120VAC/60 Hz for model N22010 and N280.

GENERATORS

Nitrogen

Flows to 557 LPM Cont.

Ordering Information							
Product Number	Analyzer	Flow Ranges (LPM)	O ₂ Analyzer	Max. Inlet Pressure (psig)	Min. Inlet Pressure (psig)	Max. Pressure Drop (@ 99% N ₂ Purity, 125 psi)	Nitrogen Purity
Y80-N245	No	16–62	No	145	80	10 psi	99.95%
Y80-N245A	Yes	16–62	Yes	145	80	10 psi	99.95%
Y80-N280A	Yes	28–124	Yes	145	80	10 psi	99.95%
Y80-N2135	No	52–151	No	145	80	10 psi	99.95%

	Available Options	
	Product Number	Description
	Y80-438027	Prefilters
	Y80-N220102	Oxygen Analyzer
	Y80-IK572	Installation Kit for all models
	Y80-75344 (New)	Activated Carbon Tower
	Y80-75345 (Rebuilt)	Activated Carbon Tower

High-Purity Models

Description: The Airgas® Models Y80-HPN21100, Y80-UHPN21100, Y80-HPN22000, Y80-7697NA and Y80-7698NA Nitrogen Generators have been designed specifically to produce up to 12.0 lpm of ultra-high-purity nitrogen gas. These systems are completely engineered to transform standard compressed air into 99.99% or 99.9999% nitrogen, matching the specifications of UHP cylinder gas.

Nitrogen is produced utilizing a combination of state-of-the-art purification technologies and high-efficiency filtration. Pressure swing absorption is utilized for the removal of O₂, CO₂, and water vapor. A catalyst module is incorporated in Models Y80-UHPN21100 and Y80-7698NA to oxidize hydrocarbons from the inlet air supply.

Airgas® Nitrogen Generators are engineered and packaged in a small cabinet to fit on or beneath any benchtop. The Airgas® Model Y80-7692NA and Y80-7694NA are ideal for carrier gas applications. The Airgas® Models Y80-7697NA and Y80-7698NA are ideal for purging ICP's.

Nitrogen

GENERATORS



Design Features

Compact Design

frees up valuable laboratory floor space.

Use for Variety of Disciplines

Gas Chromatography, LC/MS, ICP and thermal analysis.

Eliminates Inconvenience

no need for nitrogen cylinders or dewars in the laboratory.

High Efficiency Coalescing Prefilters

0.01 micron (absolute) membrane filter incorporated into each design.

Long Term Cost Stability

price increases, contract negotiations, long term commitments or tank rental no longer a concern.

Specifications

Inlet Pressure Range	60–120 psig
Outlet Pressure Range	35–85 psig
Flow Capacity	0–1,100; 0–2,000; 0–12,000
Power Requirement	110VAc
Dimensions (WxHxD)	UHPN21100, HPN22000: 12" W x 16" D x 35" 7697, 7698: 25" W x 25" D x 41" H
Weight	UHPN21100, HPN22000: 115 lbs 7697, 7698: 500 lbs

Ordering Information

Product Number	Flow Rate (cc/min.)	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Purity
Y80-HPN21100	1,100	125	85	99.9999%
Y80-HPN21100	1,000	110	75	99.9999%
Y80-HPN21100	900	100	65	99.9999%
Y80-HPN21100	800	90	60	99.9999%
Y80-HPN21100	700	80	50	99.9999%
Y80-HPN21100	600	70	45	99.9999%
Y80-HPN21100	500	60	35	99.9999%
Y80-UHPN21100	1,100	125	85	99.9999%
Y80-UHPN21100	1,000	110	75	99.9999%
Y80-UHPN21100	900	100	65	99.9999%
Y80-UHPN21100	800	90	60	99.9999%
Y80-UHPN21100	700	80	50	99.9999%
Y80-UHPN21100	600	70	45	99.9999%
Y80-UHPN21100	500	60	35	99.9999%
Y80-HPN22000	2,000	75–120	90	99.9999%
Y80-7697NA	12,000	60–120	75	99.9999%
Y80-7698NA	12,000	60–120	83	99.9999%

Available Options

Product Number	Description
Y80-438027	Prefilters

Low- and Mid-Flow Nitrogen Generators

Model N2-22 Mid-Flow

GENERATORS

Description: The Airgas® Low-Flow Nitrogen Generators include models N2-04, N2-14, N2-14A that produce up to 61 SLPM of compressed nitrogen, on-site. The Airgas® Mid-Flow Nitrogen Generators include models N2-22, N2-22ANA, N2-35, and N2-35ANA that produce 132 SLPM of compressed nitrogen, on-site. The purity level of the nitrogen stream is defined by the user, for the application, and may range from 95% to 99.5%.

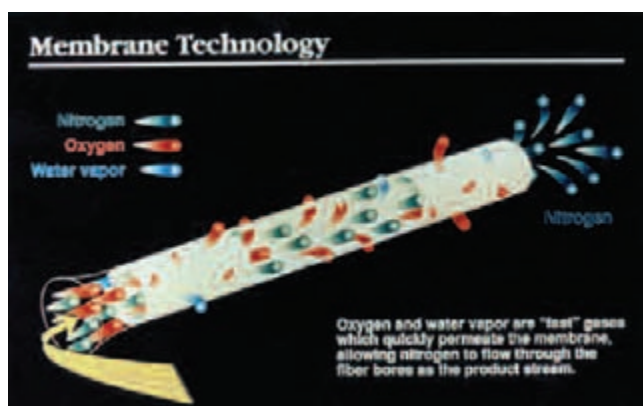
Low-Flow Model N2-14ANA and Mid-Flow Models N2-22ANA and N2-35ANA Nitrogen Generators include an oxygen analyzer which monitors the oxygen concentration of the nitrogen stream. An audible alarm signals high or low oxygen concentrations. Airgas® Nitrogen Generators are complete systems engineered to transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without the need for operator attention.

Nitrogen is produced by utilizing a combination of filtration and membrane separation technologies. A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01 micron. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen output stream and an oxygen enriched permeate stream, which is vented from the system. The combination of these technologies produces a continuous on demand supply of pure nitrogen.

Typical applications include: LC/MS, nebulizer gas, chemical and solvent evaporation, instrument purge and supply, evaporative light scattering detector use (ELSD), and sparging.



This Technology Features Advanced HiFluxx Fiber!



Design Features

Recommended and used by all major LC/MS manufacturers
Models N2-04, N2-14, N2-22, N2-35 require no electricity
Compact design frees up valuable laboratory floor space
Phthalate-free, no organic vapors
Unlike PSA technology, membrane will not suppress corona needle discharge.

Principal Specifications

Models	N2-04, N2-14, N2-14ANA, N2-22, N2-22ANA, N2-35 and N2-35ANA
Nitrogen Purity	95.0% - 99.5%
Atmospheric Dewpoint	-58°F (-50°C)
Suspended Liquids	None
Particles > 0.01 µm	None
Commercially Sterile	Yes
Phthalate-free	Yes
Hydrocarbon-free	Yes
Min./Max. Operating Pressure	60/145 psig
Max. Press. Drop @ 99% N2 Purity, 125 psig	10 psig
Recommended Ambient Operating Temperature	68°F (20°C)
Max. Inlet Air Temperature	110°F (43°C)
Inlet/Outlet Ports	1/4" NPT
Electrical Requirements	
N2-04, N2-14, N2-22, N2-35	None
N2-14ANA, N2-22ANA, N2-35ANA	120 VAC/60 Hz/25 Watts
Shipping Weight	
N2-04	42.5 lbs (19 kg)
N2-14	75 lbs (34 kg)
N2-14ANA, N2-22, N2-22ANA	80 lbs (36 kg)
N2-35, N2-35ANA	90 lbs (41 kg)
Oxygen Analyzer	Included with Model N2-14ANA, N2-22ANA, N2-35ANA
Dimensions, N2-04	16.1"h x 10.7"w x 13.4"d (40.9cm x 27.2cm x 34cm)
Dimensions, N2-14, N2-14ANA, N2-22, N2-22ANA, N2-35, N2-35ANA	51.5"h x 18"w x 16.2"d (130.8cm x 45.7cm x 41.1cm)

GENERATORS

Model N2-22 Mid-Flow

Low- and Mid-Flow Nitrogen Generators Cont.

Nitrogen Purity / Flow Chart

Flow measured in SLPM at indicated Operating Pressure, psig. Flows for Model N2-04 printed in black, flows for Models N2-14 and N2-14A in red.

% N ₂	145	125	110	100	90	80	70	60
99.5	—	11	—	—	—	6	—	4
99	6	18	5	4	4	10	3	2
98	11	29	10	8	7	18	5	4
97	15	40	13	10	9	25	7	6
96	20	50	17	13	12	31	9	7
95	24	60	21	17	15	37	11	9

Nitrogen Purity / Flow Chart

Flow measured in SLPM at indicated Operating Pressure, psig. Flows for Model N2-22, N2-22A printed in black, flows for Models N2-35, N2-35A in red.

% N ₂	145	125	110	100	90	80	70	60
99	19	29	16	13	12	18	9	17
99	29	44	25	20	18	27	13	11
98	44	66	38	30	27	41	20	17
97	59	83	50	40	36	52	26	23
96	73	109	63	50	45	67	32	27
95	88	131	77	61	55	81	41	35

Ordering Information for assistance, call 1-800-939-5711, 8 to 5 Eastern Standard Time

Description	Galvanic Cell	Annual Installation Kit	Installation Kit	Preventative Maintenance Plan	Extended Support with 24 Month Warranty
Y80-N204	N/A	MK7840	IK7572	N2-04 -PM	N2-04-DN2
Y80-N214	N/A	MK7572C	IK7572	N2-14-PM	N2-14-DN2
Y80-N214ANA	72695A	MK7572C	IK7572	N2-14A-PM	N2-14A-DN2
Y80-N222, Y80-N235	N/A	MK7572C	IK7572	N2-22-PM, N2-35-PM	N2-22-DN2, N2-35-DN2
Y80-N222ANA, Y80-N235ANA	72695A	MK7572C	IK7572	N2-22A-PM, N2-35A-PM	N2-22A-DN2, N2-35A-DN2

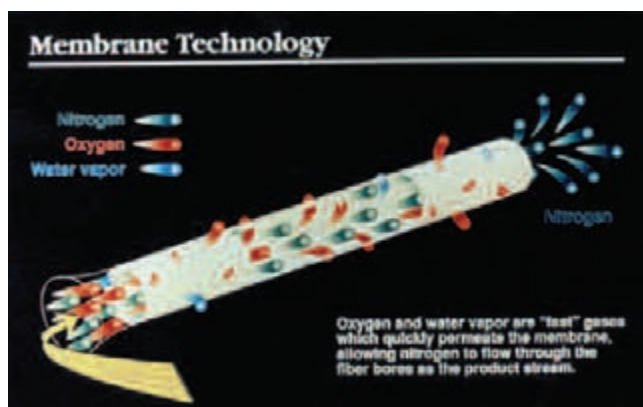
High-Flow Nitrogen Generators

Description: The Airgas® High-Flow Nitrogen Generators include models N2-45, N2-80, N2-135 that produce up to 467 SLPM of compressed nitrogen, on-site. The purity level of the nitrogen stream is defined by the user, for the application, and may range from 95% to 99.5%.

High-Flow Model N2-45ANA, N2-80ANA, and N2-135ANA Nitrogen Generators include an oxygen analyzer which monitors the oxygen concentration of the nitrogen stream. An audible alarm signals high or low oxygen concentrations. Airgas® Nitrogen Generators are complete systems engineered to transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without the need for operator attention.

Nitrogen is produced by utilizing a combination of filtration and membrane separation technologies. A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01 micron. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen output stream and an oxygen enriched permeate stream, which is vented from the system. The combination of these technologies produces a continuous on demand supply of pure nitrogen.

Typical applications include: LC/MS, nebulizer gas, chemical and solvent evaporation, instrument purge and supply, evaporative light scattering detector use (ELSD), and sparging.



Model N2-135 High-Flow

GENERATORS



Design Features

- Recommended and used by all major LC/MS manufacturers
- Models N2-45, N2-80, and N2-135 require no electricity
- Compact design frees up valuable laboratory floor space
- Phthalate-free, no organic vapors
- Unlike PSA technology, membrane will not suppress corona needle discharge.

Principal Specifications

Models	N2-45, N2-80, N2-135, N2-45ANA, N2-80ANA, and N2-135ANA
Nitrogen Purity	95.0% - 99.5%
Atmospheric Dewpoint	-58°F (-50°C)
Suspended Liquids	None
Particles > 0.01µm	None
Commercially Sterile	Yes
Phthalate-free	Yes
Hydrocarbon-free	Yes
Min./Max. Operating Pressure	60/145 psig
Max. Press. Drop @ 99% N₂ Purity, 125 psig	10 psig
Recommended Ambient Operating Temperature	72°F (22°C)
Max. Inlet Air Temperature	110°F (43°C)
Inlet/Outlet Ports	1/2" NPT
Electrical Requirements	
N2-45, N2-80, N2-135	None
N2-45ANA, N2-80ANA, N2-135ANA	120 VAC/60 Hz/25 Watts
Shipping Weight	
N2-45, N2-80, N2-135	250 lbs (114 kg)
N2-45ANA, N2-80ANA, N2-135ANA	250 lbs (114 kg)
Oxygen Analyzer	Included with Model N2-45ANA, N2-80ANA, N2-135ANA
Dimensions	67"h x 24"w x 20"d (140cm x 61cm x 50cm)

GENERATORS

High-Flow

High-Flow Nitrogen Generators Cont.

Nitrogen Purity / Flow Chart

Flow LPM (liters per minute), at 68°F (25°C) inlet air temperature and operating pressure, PSIG. Flows printed in black are for Models N2-45 and N2-45A.
Flows printed in red are for Models N2-280 and N2-280A. Flows printed in green are for Models N2-135 and N2-135A.

	145			125			110			100			90			80		
99.5	67	100	133	55	83	110	47	71	94	39	59	78	33	50	66	27	41	54
99	92	138	183	74	112	149	63	95	127	53	79	106	44	66	89	35	53	71
98	129	194	258	106	159	212	89	134	179	73	110	147	62	93	124	50	75	101
97	163	244	325	132	198	264	113	169	226	94	141	187	79	119	159	65	97	130
96	200	300	400	160	240	320	137	205	274	114	171	228	97	145	194	80	119	159
95	233	350	467	187	281	374	160	241	321	134	201	268	111	167	222	90	135	180

Ordering Information for assistance, call 1-800-939-5711, 8 to 5 Eastern Time

Description	Galvanic Cell	Carbon Tower	Maintenance Kit	Installation Kit	Preventative Maintenance Plan	Extended Support with 24 Month Warranty
Y80-N245	N/A	75344	75478	IK75880	N2-45-PM	N2-45-DN2
Y80-N245ANA	72695A	75344	75478	IK75880	N2-45A-PM	N2-45A-DN2
Y80-N280	N/A	75344	75478	IK75880	N2-80-PM	N2-80-DN2
Y80-N280ANA	72695A	75344	75478	IK75880	N2-80A-PM	N2-80A-DN2
Y80-N2135	N/A	75344	75478	IK75880	N2-135-PM	N2-135-DN2
Y80-N2135ANA	72695A	75344	75478	IK75880	N2-135A-PM	N2-135A-DN2

High-Flow Nitrogen Generators

Airgas® Monobed Nitrogen

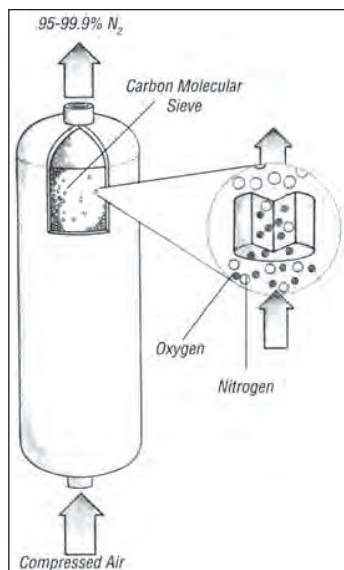
GENERATORS

Description: Airgas® Monobed Nitrogen Generators produce up to 99.95% pure, compressed nitrogen at dewpoints to -70°F (-21°C) from nearly any compressed air supply. The generators are designed to continually transform standard compressed air into nitrogen at safe, regulated pressures without operator attention.

Airgas® PSA Nitrogen Generators utilize a combination of filtration and pressure swing adsorption technologies. High-efficiency prefiltration pretreats the compressed air to remove all contaminants down to 0.1 micron. Air entering the generator consists of 21% oxygen and 78% nitrogen. The gas separation process preferentially adsorbs oxygen over nitrogen using carbon molecular sieve (CMS). At high pressures the CMS has a greater affinity for oxygen, carbon dioxide, and water vapor than it does at low pressures. By raising and lowering the pressure within the CMS bed, all contaminants are captured and released, leaving the CMS unchanged. This process allows the nitrogen to pass through as a product gas at pressure. The depressurization phase of the CMS releases the absorbed oxygen and other contaminant gases to the atmosphere.

Once the generator is installed, a continuous nitrogen supply of consistent purity is available within minutes from start-up.

Installation consists of simply connecting a standard compressed air line to the inlet and connecting the



outlet to a nitrogen line. Plug the electrical cord into a wall outlet, and the unit is ready for troublefree operation. This system is designed to operate 24 hours per day, 7 days per week.

Once the system is operating, it requires little monitoring. The only maintenance involves changing the coalescing prefilter cartridges and final sterile air filter periodically. The PSA towers do not require any maintenance.

An oxygen monitor to measure the oxygen concentration of the nitrogen stream is available as an option. An audible alarm signals high or low oxygen concentrations (determined by the application). The oxygen analyzer is supplied with alarm relay outputs which may be used to signal a remote alarm, open a backup supply or the process stream, or close the process flow for protection of downstream equipment or processes.

Design Features

- Lower cost...eliminates the need for costly gas cylinders
- Complete package with prefilters, final filters, and receiving tank
- Compact - frees up valuable floor space
- Hassle-free, easy to install, easy to operate
- Safe and reliable



Nitrogen Purity / Flow Chart

Models AGS200 and AGS400

	Flow Rate (SCFH)	Flow Rate (SCFH)
Model	99.9%, 140 psig	99.99%, 140 psig
Y80-AGS200	235	47
Y80-AGS400	470	94

Principal Specifications

Model	Y80-AGS200, Y80-AGS400
Nominal Conditions	
Feed Pressure	40 psig
Temperature	80°F
Ambient Pressure	1 Atm.
Compressed Air Specifications	
Maximum Pressure	140 psig
Temperature Range	60°F - 105°F
Dewpoint	40°F pressure dewpoint or better
Residual Oil Content	Trace
Particles	<.01 micron
Ambient Conditions	
Temperature	45°F-90°F
Ambient Pressure	Atmospheric
Air Quality	Clean air without contaminants
Dimensions	28.5"L x 32.25"D x 76.25"H
Weight	520 lbs (AGS200), 738 lbs (AGS400)
Inlet	1/2" NPT
Outlet	1/2" NPT

NitroVap Gas Generators

NitroVap-1LV and NitroVap-2LV

GENERATORS

Description: Airgas® NitroVap-1LV and NitroVap-2LV Nitrogen Generators can provide clean, ultra-dry nitrogen to sample evaporators. These systems offer high nitrogen output flows in a miniature cabinet. The user can activate the manual SLEEP economy mode to eliminate compressed air consumption when the sample concentrator is not in use.

Nitrogen Technology

Nitrogen is produced by utilizing a combination of filtration and membrane separation technologies. A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01 micron. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen output stream and an oxygen enriched permeate stream, which is vented from the system. The combination of these technologies produces a continuous on demand supply of pure nitrogen.

Gas Generator Benefits

The NitroVap generators are complete systems with state-of-the-art, highly reliable components engineered for easy installation, operation, and long term performance. **The Airgas® NitroVap-1LV and NitroVap-2LV** eliminate cost of LN2 dewar and nitrogen cylinder.

Ease of Use

Since NitroVap generators incorporate unique membrane separation technology, nitrogen delivery is immediate to the sample concentrator. “Lock-it-and-leave-it” operation of the sample concentrator is maintained without downtime and without “running out of gas” mid blow-down.



Design Features

- Ideal for any combination of sample evaporators up to 100 nozzle positions
- Produces clean, dry (to -20°F) dewpoint evaporator grade nitrogen from any standard laboratory compressed air source
- Accelerates evaporation by decreasing the partial vapor pressure above the solvent liquid
- Recommended and used by many sample concentrator and sample evaporator manufacturers
- Payback period of typically less than one year
- Sleep economy mode
- Silent operation and minimal operator attention required

Principal Specifications

Nitrogen Purity	Up to 90%
Nitrogen Dewpoint	Down to -20°F (-29°C) atmospheric
Maximum Nitrogen Flow Rate	NitroVap-1LV: up to 80 slpm @ 100 psig input up to 140 slpm @ 125 psig input NitroVap-2LV: up to 160 slpm @ 100 psig input up to 287 slpm @ 125 psig input
Electrical Requirements	None
Nitrogen Outlet Pressure	0-15 psig user controlled
Dimensions	10.63"w x 14.1"d x 16.5"h (26.92cm x 35.81cm x 41.91cm)
Inlet Port/Outlet Port	1/4" NPT (female)
Shipping Weight	53 lbs/24 kg



This Technology
Features Advanced
HiFluxx Fiber!

GENERATORS

NitroVap-1LV and NitroVap-2LV

NitroVap Gas Generators Cont.

Ordering Information for assistance, call 1-800-939-5711, 8 to 5 Eastern Time

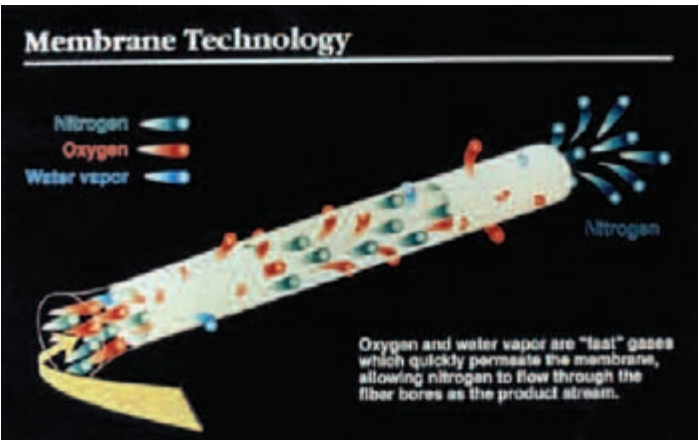
Model	Description
Y80-NITROVAP1LV and Y80-NITROVAP2LV	NitroVap Nitrogen Generators
Y80-MKNITROVAP	Maintenance Kit (Includes 1 each filter cartridge, and 1 each membrane cartridge)
Y80-NITROVAP1LVPM, Y80-NITROVAP2LVPM	Preventative Maintenance Contract
Y80-NITROVAPDN2	Extended Support with 24 Month Warranty

Available Options

Product Number	Description
*	TurboVap from Calper-Zymark
*	N-Evap from Organomation
*	RapidVap from LabConco
*	Reacti-Vap from Pierce Biotechnology
*	Duo-Vap from Jones Chromatography
*	DryVap from Horizon Technology
*	Evaporex from Apricot



* Please call 1-800-939-5711 for quotation.



Laboratory Membrane Air Dryers

Model 64-02

AIR DRYERS

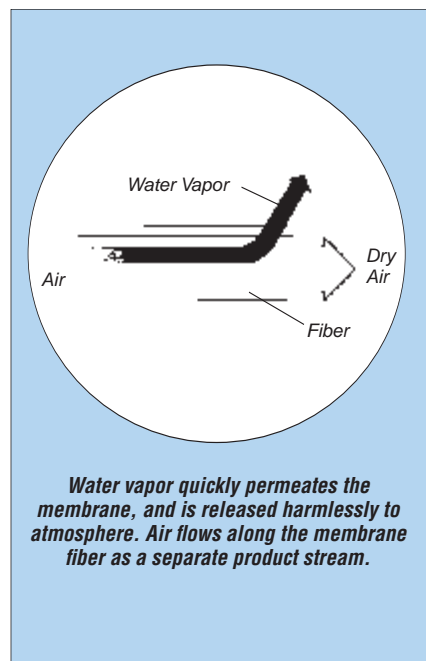
Description: The Airgas® 64-01, 64-02 and 64-10 Membrane Air Dryers will supply oil and particulate free dry compressed air to atmospheric dewpoints as low as -40°F (-40°C), and at flow rates of up to 25 SCFM. Airgas® Membrane Air Dryers are engineered for easy installation, operation, and long term reliability. The dryers incorporate the highest efficiency membrane available, offering low cost operation and minimal maintenance.

Airgas® Membrane Air Dryers are designed to operate continuously, 24 hours per day, 7 days per week. The only maintenance required is changing the prefilter cartridge once each year. This annual maintenance takes approximately 5 minutes.

The dryers are lightweight, compact, and can be easily installed on an existing air line. In a vertical or horizontal orientation (depending upon model), a high efficiency coalescing prefilter is installed directly upstream from the dryer module to protect the membrane from potential contamination caused by pipe scale, liquids, or other solids. Airgas® Membrane Air Dryers require no electrical connections, making them ideal for remote and point-of-use installations or for installation in hazardous areas.

Design Features

- Low dewpoint instrument air - prevents analytical instrument contamination
- Dry air for hazardous areas
- No electricity required - low operating costs
- No refrigerants or freons - environmentally sound
- Explosion proof
- No moving parts or motors - silent operation



AIR DRYERS

Model 64-02

Laboratory Membrane Air Dryers Cont.

Principal Specifications			
Membrane Air Dryers	Model	At -40°F Dewpoint (-40°C)	At 32°F Dewpoint (0°C)
Max. Flow Rate (1)	Y80-6401	28 LPM	71 LPM
	Y80-6402	57 LPM	142 LPM
	Y80-6410	283 LPM	708 LPM
Min/Max Inlet Air Temp. (2)		40°F/140°F (4°C/60°C)	
Recommended Operating Temp. Range		60°F-100°F (16°C-38°C)	
Min/Max Inlet Pressure		60 psig/150 psig	
Maximum Pressure Drop		<4 psig	
Wall Mountable		Yes	
Inlet/Outlet Port Size	Y80-6401	1/4" NPT (female)	
	Y80-6402	1/4" NPT (female)	
	Y80-6410	1/2" NPT (female)	
Electrical Requirements	None		
Shipping Weight	Y80-6401	9 lbs. (4 kg)	
	Y80-6402	10 lbs. (5 kg)	
	Y80-6410	18 lbs. (9 kg)	
Dimensions	Y80-6401	6"w x 22"h x 5"d (15cm x 57cm x 13cm)	
	Y80-6402	6"w x 23"h x 5"d (15cm x 112cm x 13cm)	
	Y80-6410	6"w x 37"h x 5"d (15cm x 93cm x 13cm)	

Notes:

1 Dewpoint specified with inlet air at 100°F (38°C) saturated at 100 psig.

2 Inlet compressed air dewpoint must not exceed the ambient air temperature.

Ordering Information for assistance, call 1-800-939-5711, 8 to 5 Eastern Time

Model Number	Description
64-01, 64-02, 64-10	Airgas® Membrane Dryer
64-01 MK7601	Annual Maintenance Kit
64-02 MK7601	
64-10 MK7610	
64-01 IK7572	Installation Kit
64-02 IK7572	
64-10 IK75880	
All 72-130-V883	Pressure Regulator
64-01 64-01-PM	Preventative Maintenance Plan
64-02 64-02-PM	
64-10 64-10-PM	
64-01 64-01-DN2	Extended Support with 24 Month Warranty
64-02 64-02-DN2	
64-10 64-10-DN2	

Ultra Dry Gas Generator

Model UDA-300NA

GENERATORS

Description: The Airgas® Model UDA-300NA

Compressed Air Dryer provides ultra-dry, purified compressed air to analytical instruments. The model UDA-300 reduces the dewpoint to -100°F (-73°C) without operator attention.

Each system is delivered complete, and ready for easy installation. A high efficiency prefiltration system, automatic drains, a $0.01\mu\text{m}$ final filter, a moisture indicator, and pretested controls are integral to the design of each dryer.

To install, simply connect your house compressed air supply (at least 60 psig and 1/4 inch pipe) to the dryer inlet port, and connect the dryer outlet port to your instruments. Plug the electrical cord into a wall outlet - no electrician required - and the unit is ready for trouble-free operation.

Designed specifically for NMR instrumentation, the generator is completely automatic, and virtually maintenance free. It is ideal for injecting, spinning, and lifting operations. It is recommended by major NMR instrument manufacturers and is currently installed in several thousand locations.



Design Features

- Supplies ultra-dry, purified compressed air to NMR Spectrometers and other analytical instruments
- Ideal gas supply for spindle and automatic sample changer
- Completely eliminates costly, inconvenient nitrogen dewars - never pay for or change out another dewar
- Compact design frees up valuable laboratory floor space
- Completely automatic - plug it in and forget about it

Principal Specifications

Model UDA-300NA Compressed Air Dryer	
Dew Point	-100°F (-73°C)
Flow Rate at 60 psig	390 scfh (184 lpm)
Flow Rate at 125 psig	720 scfh (340 lpm)
Min/Max Inlet Air Pressure	60 psig/125 psig
Max Inlet Air Temperature (1)	78°F (25°C)
Inlet/Outlet Port Size	1/4" NPT (female)
Electrical Requirements (2)	120 VAC/60 Hz, 10 Watts
Dimensions	41"h x 15"w x 8"d (104cm x 38cm x 20cm)
Shipping Weight	50 lbs (23 kg)

Notes:

1 Outlet dew point will increase at higher inlet compressed air temperatures.

2 Refer to voltage appendix for electrical and plug configurations outside North America.

Ordering Information for assistance, call 1-800-939-5711, 8 to 5 Eastern Time

Model Number	Description
Y80-UDA300NA	Compressed Air Dryer
Y80-72130V883	Inlet Pressure Regulator
Y80-MK7525	Annual Maintenance Kit
Y80-UDA-300-PM	Annual Preventative Maintenance Plan
Y80-UDA-300-DN2	Extended Support with 24 Month Warranty

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions

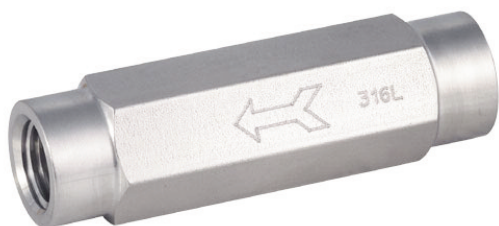


Airgas.
You'll find it with us.™

VALVES

Check Valves

Check Valve



Description: These ball-type check valves are used for one-direction flow. They provide a simple, but effective, leak-tight closure with minimum flow resistance. Check valves are available in brass, 316 stainless steel, and Monel metal.

MAWP is 3,000 psi for these check valves.

The brass and stainless steel models are cleaned for all analytical applications. The Monel models are available for corrosive gases.

Ordering Information

Product Number	CONNECTIONS		MATERIAL	
	Inlet	Outlet	Body	O-Ring
Y33-142	1/4"FNPT	1/4"FNPT	Nickel-Plated Brass	Viton-A®
Y33-342	1/4"FNPT	1/4"FNPT	Monel	Viton-A®
Y33-343	1/4"FNPT	1/4"FNPT	Monel	ERP
Y33-442	1/4"FNPT	1/4"FNPT	Stainless Steel	Viton-A®
Y33-443	1/4"FNPT	1/4"FNPT	Stainless Steel	EPR
Y33-444	1/4"FNPT	1/4"FNPT	Stainless Steel	Neoprene

VALVES

Safety Relief Valves

Safety Relief Valve for Gas Service



Description: These safety relief valves are used primarily for automatic venting of gas or liquid systems that are over pressurized. These valves can be used with any pressure control system to relieve excess downstream pressure resulting from system malfunction. The relief pressure setting is easily adjusted through the outlet port.

Note: Do not interchange valve pressure springs. For high-sensitivity relief valves, select one of our high-purity backpressure regulators.

Specifications/Materials

Relief Pressure	3-50, 50-150, 150-350 psig
Flow Capacity	Cv=0.35
Seat	Viton®
Body	Brass or Stainless Steel

Ordering Information

Product Number	Pressure Range (psig)	End Connections	Material
Y33-B350	3-50	1/4" MNPT x 1/4" MNPT	Brass
Y33-B50150	50-150	1/4" MNPT x 1/4" MNPT	Brass
Y33-B150350	150-350	1/4" MNPT x 1/4" MNPT	Brass
Y33-4350	3-50	1/4" MNPT x 1/4" MNPT	Stainless Steel
Y33-450150	50-150	1/4" MNPT x 1/4" MNPT	Stainless Steel

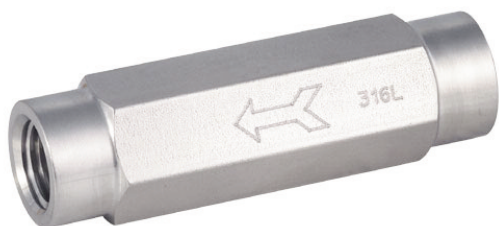
Available Options

Product Number	Description
Y33-DCGR	Polyethylene Safety Deflector Cap

VALVES

Check Valves

Check Valve



Description: These ball-type check valves are used for one-direction flow. They provide a simple, but effective, leak-tight closure with minimum flow resistance. Check valves are available in brass, 316 stainless steel, and Monel metal.

MAWP is 3,000 psi for these check valves.

The brass and stainless steel models are cleaned for all analytical applications. The Monel models are available for corrosive gases.

Ordering Information

Product Number	CONNECTIONS		MATERIAL	
	Inlet	Outlet	Body	O-Ring
Y33-142	1/4"FNPT	1/4"FNPT	Nickel-Plated Brass	Viton-A®
Y33-342	1/4"FNPT	1/4"FNPT	Monel	Viton-A®
Y33-343	1/4"FNPT	1/4"FNPT	Monel	ERP
Y33-442	1/4"FNPT	1/4"FNPT	Stainless Steel	Viton-A®
Y33-443	1/4"FNPT	1/4"FNPT	Stainless Steel	EPR
Y33-444	1/4"FNPT	1/4"FNPT	Stainless Steel	Neoprene

VALVES

Safety Relief Valves

Safety Relief Valve for Gas Service



Description: These safety relief valves are used primarily for automatic venting of gas or liquid systems that are over pressurized. These valves can be used with any pressure control system to relieve excess downstream pressure resulting from system malfunction. The relief pressure setting is easily adjusted through the outlet port.

Note: Do not interchange valve pressure springs. For high-sensitivity relief valves, select one of our high-purity backpressure regulators.

Specifications/Materials

Relief Pressure	3-50, 50-150, 150-350 psig
Flow Capacity	Cv=0.35
Seat	Viton®
Body	Brass or Stainless Steel

Ordering Information

Product Number	Pressure Range (psig)	End Connections	Material
Y33-B350	3-50	1/4" MNPT x 1/4" MNPT	Brass
Y33-B50150	50-150	1/4" MNPT x 1/4" MNPT	Brass
Y33-B150350	150-350	1/4" MNPT x 1/4" MNPT	Brass
Y33-4350	3-50	1/4" MNPT x 1/4" MNPT	Stainless Steel
Y33-450150	50-150	1/4" MNPT x 1/4" MNPT	Stainless Steel

Available Options

Product Number	Description
Y33-DCGR	Polyethylene Safety Deflector Cap

Diaphragm Packless Valves

Diaphragm

VALVES

Description: These high-integrity valves are recommended for gas handling systems where inboard diffusion of air or moisture must be kept to a minimum. The valves have multiple metal diaphragms that provide a permanent seal capable of passing the helium leak test to 1×10^{-8} ccs.

These valves come in multiturn and quarter turn models.



Specifications/Materials	
Maximum Operating Pressure	3,000 psig
Flow Capacity	Cv=0.16, orifice 0.094
Ambient Operating Temperature	-40° F to +200° F
Body	Brass or Stainless Steel
Seat	PCTFE

Ordering Information (multi-turn models)				
Product Number	Length	Material	CONNECTIONS	
			Inlet	Outlet
Y36-2DCC	2 3/8"	316 SS	1/8" Compression*	1/8" Compression*
Y36-4DBMM	2 3/8"	Brass	1/4" MNPT	1/4" MNPT
Y36-4DBMFL	3 3/8"	Brass	1/4" MNPT	1/4" FNPT
Y36-4DFF	2 3/8"	316 SS	1/4" FNPT	1/4" FNPT
Y36-4DMM	2 3/8"	316 SS	1/4" MNPT	1/4" MNPT
Y36-4DMC	2 3/8"	316 SS	1/4" MNPT	1/4" Compression*
Y36-4DMFL	3 3/8"	316 SS	1/4" MNPT	1/4" FNPT

Ordering Information (1/4-turn models)					
Product Number	Lever Color	Length	Material	CONNECTIONS	
				Inlet	Outlet
Y37-2DCC	Silver	2 3/8"	316 SS	1/8" Compression*	1/8" Compression*
Y37-4DBCC	Silver	2 3/8"	Brass	1/4" Compression*	1/4" Compression*
Y37-4DBMM	Silver	2 3/8"	Brass	1/4" MNPT	1/4" MNPT
Y37-4DBMFL	Silver	3 3/8"	Brass	1/4" MNPT	1/4" FNPT
Y37-4DFF	Silver	2 3/8"	316 SS	1/4" FNPT	1/4" FNPT
Y37-4DMFL	Silver	2 3/8"	316 SS	1/4" MNPT	1/4" FNPT

*All compression ends are two-piece ferrule construction.

VALVES

Instrument Valves

Needle Valves



Description: Instrument valves provide good flow regulation for most applications. Valves are offered in various materials and end fittings. PTFE packing provides leak-proof performance for all applications. The maximum rated pressure for these valves is 3,000 psig at 70° F, and the temperature rating is -65° F to +450° F.

These valves are non-lubricated and are cleaned for all analytical applications.

Ordering Information

Product Number	Inlet	Outlet	Orifice	Cv	M A T E R I A L	
					Body	Sem
Y34-111	1/4" MNPT	1/4" MNPT	0.170	0.35	Nickel-Plated Brass	316 SS
Y34-311	1/4" MNPT	1/4" MNPT	0.140	0.27	Monel	Monel
Y34-411	1/4" MNPT	1/4" MNPT	0.140	0.27	316 SS	316 SS
Y34-118	1/4" MNPT	1/4" Compression	0.140	0.27	Nickel-Plated Brass	316 SS
Y34-418	1/4" MNPT	1/4" Compression	0.140	0.27	316 SS	316 SS

VALVES

Lecture Bottle Valves

Control Valves for Lecture Bottles



Description: Lecture bottle control valves provide an economical way of withdrawing gas from lecture bottles when critical flow control is not required. All valves are straight pattern and are available in brass, stainless steel, and Monel metal. Each lecture bottle control valve features a .062 orifice diameter and is equipped with a CGA 110 (5/16" – 32 MNPT) valve inlet and a Viton® O-ring.

Note: These valves are designed to be connected directly to gas cylinders. Valves control flow and DO NOT control pressure. If pressure control is required, please select one of our pressure regulators, instead.

Ordering Information

Product Number	Outlet	Orifice	Cv	M A T E R I A L	
				Body	Sem
Y35-123	1/4" Hose Barb	0.062	0.16	Brass	Stainless Steel
Y35-323	1/4" Hose Barb	0.062	0.16	Monel	Monel
Y35-423	1/4" Hose Barb	0.062	0.16	Stainless Steel	Stainless Steel
Y35-322	1/4" Compression	0.062	0.16	Monel	Monel
Y35-422	1/4" Compression	0.062	0.16	Stainless Steel	Stainless Steel

Flow Control

Manual Valves

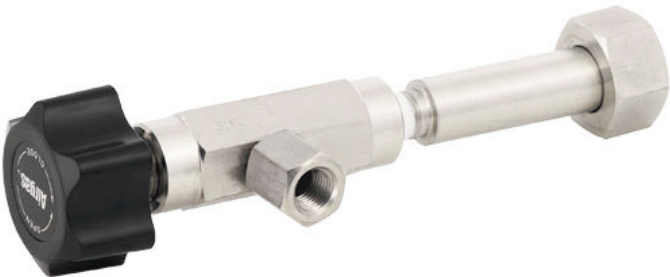
VALVES

Description: Manual flow control valves provide a simple, economical means of controlling the flow of gas directly from a cylinder. They are commonly used to control flow rates in continuous or semi-batch processes.

Our manual flow control valves are available in brass, 316 stainless steel, and Monel metal. All models feature PTFE packing and Monel stems.

These valves are equipped with a 1/4" FNPT outlet port, while hose and compression fitting adaptors are available options.

Note: These valves are designed to be connected directly to gas cylinders. Valves control flow and DO NOT control pressure. If pressure control is required, please select an appropriate model from our extensive line of pressure regulators.



Ordering Information	
Product Number	Material
Y30-111 (CGA)	Brass
Y30-411 (CGA)	Stainless Steel
Y30-311 (CGA)	Monel

VALVES

Excess Flow

Excess Flow Shut-Off Valve



Tag Out

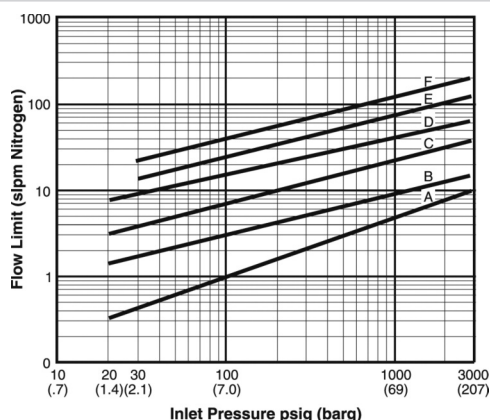
Design Features

Control Valve Automatically Shuts Off

the gas delivery if the gas flow exceeds a preset limit.

Differential Pressure not Affected

by mounting orientation (non-attitude sensitive).



Specifications

Maximum Rate Inlet Pressure	3,500 psig (241 bar)
Flow Shut-Off @ 1000 psi Inlet	5, 9, 22, 40, 72, 121 slpm
Ambient Operating Temperature	-10° F to 150° F (-23° C to 66° C)
Designed Leak Rate	2 x 10 ⁻⁹ ccs (helium)
Weight	12.5 oz. (.32 kg)
Inlet	¼" FNPT
Outlet	¼" FNPT
Differential Pressure Effect	5 psig (3 bar) @ 30 psig; 12 psig (8 bar) @ 1,000 psig
Orifice	Hastelloy C-22®

Description:The Airgas® Excess Flow Shut-Off Valve is a non-attitude sensitive, excess flow shut-off valve designed to operate with a wide range of inlet pressures.

The capability of operating from 10 to 3,500 psig allows it to be used either between a high-pressure source at the inlet to the pressure regulator, or in the low-pressure delivery line to a process. In both applications, this control valve will automatically shut off the delivery of gas if it exceeds a preset limit.

The functional components of the Airgas Excess Flow Shut-Off Valve are incorporated within the body style of a 1¼ inch Quantum valve. An actuating knob has been designed to manually operate the valve and clearly indicate the relative operating position - either "Open (Reset)" or "Auto (Shut Off)." A pneumatic actuator may be substituted for the knob, which makes it possible to reset the valve by sending a pressure signal from a remote source.

The Airgas Excess Flow Shut-Off Valve is offered with six different pressure/low limits: A, B, C, D, E, and F (see flow curve)*. The nominal differential pressure created at the flow limit is 5 psig for limit valves A, B, C, and D. For limit values E and F, the differential pressure is 12 psig. The differential pressure that is created is not affected by mounting orientation (nonattitude sensitive).

This valve can also be supplied with an unique lock out tag out device that requires the operator to repair the pipe line before the valve can be put back into operational mode.

Materials

Body	Stainless Steel
Bonnet	Stainless Steel
Seat	PCTFE
Diaphragm	Elgiloy®
Valve Stem	Stainless Steel (lubricated)
Valve Spring	Hastelloy C-22®

Ordering Information

Product Number		Chart Code	Material	1,000 psig Inlet Press.	30 psig Inlet Press.
Without Lock out	With Lock out				
Y99-4EFV005	Y99-4EF005LO	A	Stainless Steel	4.8 SLPM	0.4 SLPM
Y99-4EFV009	Y99-4EF009LO	B	Stainless Steel	9.1 SLPM	1.7 SLPM
Y99-4EFV022	Y99-4EF022LO	C	Stainless Steel	21.8 SLPM	3.9 SLPM
Y99-4EFV040	Y99-4EF040LO	D	Stainless Steel	39.5 SLPM	9.0 SLPM
Y99-4EFV072	Y99-4EF072LO	E	Stainless Steel	72.3 SLPM	14.4 SLPM
Y99-4EFV121	Y99-4EF121LO	F	Stainless Steel	120.6 SLPM	22.5 SLPM

Whisper Valve

Silenced Cryogenic Safety Relief Valve

MISCELLANEOUS EQUIPMENT

Description: The Whisper Valve is a silenced safety device for use with cryogenic containers.

The valve solves the problem of the loud noise, over 100 dB, associated with the activation of the relief valve in cryogenic containers containing nitrogen, argon or carbon dioxide. Many users of gas in cryogenic containers complain to their suppliers that the loud activation noise scares their employees and causes work disruptions and results in damaged product.

The Whisper Valve is easily installed on the vent valve of any cryogenic container and silently relieves the container pressure slightly below the normally installed relief valve. Whisper Valve reduces the relief of gas pressure at a noise level of less than 40–50 dB, for reference the average library noise level is 40 dB.

The Whisper Valve also reduces the gas losses of your cryogenic container to less than 48 cubic feet over 24 hours.

Whisper Valves are available in four settings, 22 psig, 230 psig, 350 psig, and 500 psig.



Whisper Valve takes the “pop” out of cryogenic safeties

Design Features

- Reduces cryogenic relief valve blow-off noise to less than 40 dB
- Easily installs on any cryogenic argon, nitrogen or carbon dioxide container
- Available in four ranges to prevent most container noisy blow-offs
- Reduces gas losses to less than 48 cubic feet per 24 hours
- Convenient wall mount kit available
- Standard CGA 295 inlet connection (CGA 440 for oxygen)

Ordering Information

Product Number	Description
Y36-863622	Whisper valve for cryogenic containers with 22 psig relief settings
Y36-8636230	Whisper valve for cryogenic containers with 230 psig relief setting
Y36-8636350	Whisper valve for cryogenic containers with 350 psig relief setting
Y36-8636500	Whisper valve for cryogenic containers with 500 psig relief setting
Y36-8636MKT	Wall mount bracket, panel mount nut, and 6-foot hose with CGA 295
Y36-863602230	For oxygen 230 psi relief (CGA 440)
Y36-8636350320	For CO ₂ (CGA 320) 350 psi relief

Valves – Purge Assemblies

Engineering the Right Solutions



Analytical Tee-Purge Assemblies

Description: Contamination cannot be tolerated in any high-purity analytical system. Even low levels of oxygen and moisture from the atmosphere can be extremely troublesome. An often-overlooked source of contamination may occur when changing cylinders. Atmospheric oxygen and moisture enter the regulator when it is disconnected from the cylinder. These contaminants become trapped in the high-pressure portion of the regulator upon connection to another cylinder. If allowed to remain, they are swept into the system. Depending upon the flow rate, these impurities can disrupt the process for days or even weeks.

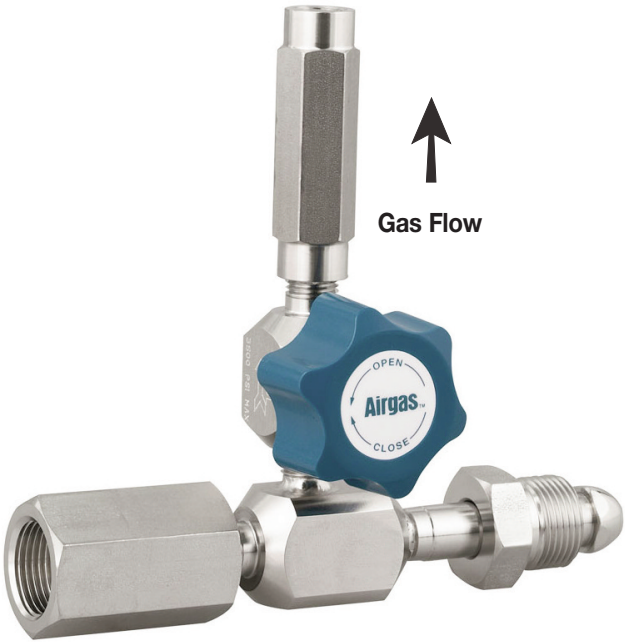
An analytical tee-purge assembly allows you to easily eliminate trapped impurities and replace them with the desired high-purity gas.

Tee-purge assemblies have been designed for use with high-purity regulators. Installed between the cylinder and the regulator, they enable you to remove contaminants before they enter the process by purging the system (including the regulator), with the process gas.

All models have a multi-turn diaphragm valve and a check valve to prevent backflow of air into the purge line.

Purge Assemblies

MISCELLANEOUS EQUIPMENT



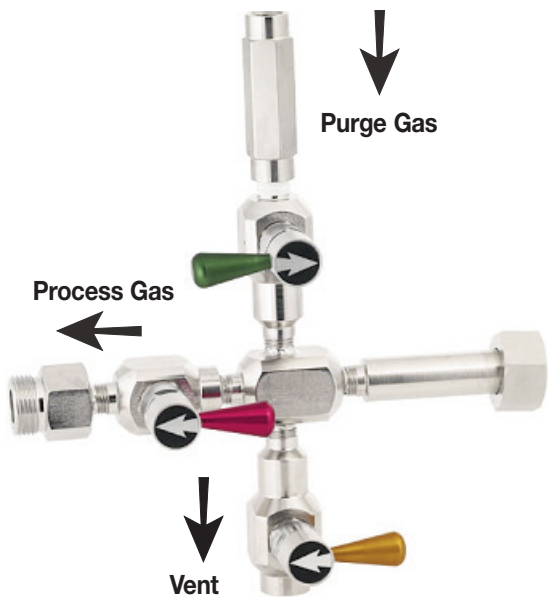
Specifications/Materials	
Maximum Rated Inlet Pressure	3,000 psig
Body	Nickel-Plated Brass or Stainless Steel
Weight	2.5 lbs or 3.0 lbs.

Ordering Information	
Product Number	Material
Y99-TP1A(CGA)	Brass
Y99-TP4A(CGA)	Stainless Steel

MISCELLANEOUS EQUIPMENT

Purge Assemblies

Cross-Purge Assemblies



Description: These compact cross-purge assemblies provide effective purging during cylinder change out. Hazardous gas traces are eliminated before opening the cylinder connection, and atmospheric gases are removed after reconnection. The quarter-turn diaphragm valves allow easy, fast purge cycles, while the color-coded lever handles indicate gas flow and mode of operation. These assemblies are also designed to prolong the service life of regulators and other gas system components.

These cross purge assemblies are essential for the safety of the operator changing the cylinders to prevent exposure to the hazardous gas. Also the prevent premature regulator failure and are required for warranty.

Each cross-purge assembly incorporates the use of an integrated check valve to prevent backflow of process gas into the purge line.

Specifications/Materials	
Maximum Rated Inlet Pressure	3,000 psig
Body	316 Stainless Steel or Monel Metal
Weight	4 lbs

Ordering Information		
Product Number	Max Pressure (psig)	Material
Y99-CPA4(CGA)	3,000	Stainless Steel
Y99-CPAM(CGA)	3,000	Monel

Tee-Purge Assemblies

Corrosive Gas Service

Description: These Airgas® corrosive gas tee-purge assemblies provide effective purging through the regulator during cylinder changeout. There must be a vent downstream of the regulator to vent the mixed gas. Moisture entering the gas stream during cylinder changeout reacts with the corrosive gas to cause regulator failure. If the system does not have a vent, we recommend an Airgas® cross purge assembly be used.

The packless diaphragm valve ensures positive shut-off and leak tight operation.

Purge Assemblies

MISCELLANEOUS EQUIPMENT



Design Features
Allows regulators to be purged with clean, dry nitrogen before cylinder changeout.
Helps eliminate regulator failure due to moisture entering the regulator during cylinder changeout.

Specifications	
Max Rated Pressure	3,000 psig
Material	Stainless Steel
Weight	3 lbs.

Ordering Information		
Product Number	Material	Max Operating Pressure (psig)
Y99-TP4C(CGA)*	Stainless Steel	3,000
*specify CGA connection required when ordering		

Specialty Gases and Equipment
Product Reference Guide

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Cryogenic

Description: These cryogenic transfer hoses are available in 4-foot and 6-foot lengths. They feature a stainless steel anti-kink armor casing. The CGA end features a 90-degree bend for ease in connecting to liquid cylinders. Hoses are CGA x 3/8" MNPT for helium, nitrogen, and argon, and CGA 440 x 440 for oxygen. Matching phase separators may be purchased at an additional cost.

Transfer Hoses



CRYOGENIC ACCESSORIES

Design Features

- **Ultimate Flexibility**
makes connection easy; coil up for storage.
- **Full Armor Casing**
protects hose from abrasion — very flexible, no broken wires.
- **Machined End Connections**
(machined from bar stock, not from tubing) — eliminate distortion, cracking, leaks.
- **Stainless Steel Fitting**
will not wear like brass.
- **Quality Design**
protects flare end from damage.
- **Stainless Steel Construction**
provides long life, faster cool-down, durability.
- **Low Profile Corrugations**
ensure faster filling, lower pressure drop, and less product loss.
- **Hoses for Oxygen**
are provided cleaned, capped and bagged for oxygen service.

Ordering Information

Product Number	Description	Length (ft)	Gas Service
Y15-4CH429538	CGA 295 x 3/8" MNPT	4	Nitrogen, Argon, Helium
Y15-4CH629538	CGA 295 x 3/8" MNPT	6	Nitrogen, Argon, Helium
Y15-4CH4440	CGA 440 x 3/8" MNPT	4	Oxygen
Y15-4CH6440	CGA 440 x 3/8" MNPT	6	Oxygen
Y15-4CH6295295	295 x 295	6	Nitrogen, Argon, Helium

Phase Separator

CRYOGENIC ACCESSORIES

Available Options

Product Number	Description	Service
Y15-PSB38	Phase Separator Bronze, 3/8" FNPT x 3" length	Nitrogen, Argon, Helium

Other Accessories

CRYOGENIC ACCESSORIES

Available Options

Product Number	Description
Y99-BF110	Cryogenic Gloves
Y99-18000	Plastic Safety Glasses
Y99-20020	Face Shield
Y32-07540017	Replacement Visor

Cryogenic Freezer Manifold

Liquid Nitrogen Freezer Supply

MANIFOLDS

Description: These manifolds are designed specifically to supply liquid nitrogen to freezers. The manifolds have safety relief valves to prevent the pipe from rupturing if liquid nitrogen becomes entrapped between the shut-off valve and the freezer solenoid valve.

The header is made from ½" XHVY brass pipe. The safety reliefs valves are extended to a height to ensure they do not become encased in ice if the manifold developed an ice coating on the outside.

Some manifolds are complete with cryogenic hoses to connect to the freezer. Please refer to ordering information.

Specifications	
Headers	½" XHvy brass pipe
Safety Relief Valve Setting	75 psig
Inlet	CGA 295 female swivel
Outlet to Freezer	CGA 295 male



Available Options		
Product Number	Description	Connection Hoses to Freezer
Y15-LS1FZ1PT	One N2 Dewar Source x One Freezer Includes 6 ft hose	Yes
Y15-LS1FZ1	One N2 Dewar Source x One Freezer	No
Y15 LS1FZ1PS	One N2 Dewar Source x One Freezer w/(1)Liquid N2 Withdrawal Port CGA 295	Yes
Y15-LS1FZ2DWR	Two N2 Dewar Source x One Freezer	Yes
Y15-LS1FZ2DWR1PS	Two N2 Dewar Source x One Freezer w/(1)Liquid N2 Withdrawal Port CGA 295	Yes
Y15-LS1FZ2DWR	Two N2 Dewar Source x One Freezer	Yes
Y15 LS2FZ1DWR	One Liquid N2 Dewar Source x Two Freezers	Yes
Y15 LS3FZ2DWR	Two Liquid N2 Dewar Source x Three Freezers	Yes
Y15 LS4FZ1DWR	One Liquid N2 Dewar Source x Four Freezers	No
Y15 LS295R	CGA 295 Relief Assembly	N/A
Y15 LSCR250	Cryogenic Relief Valve Assembly with Candy Cane Tubing	N/A
Y15 LSX2V1R	Liquid N2 splitter mini manifold, (2) outlets and relief valve with one inlet CGA 295	No

Airgas CryoWiz

The Airgas 577 series CryoWiz™ delivers a continuous supply of liquid nitrogen from a primary and secondary source automatically with no temperature change. The CryoWiz uses a proprietary algorithm and precise pressure and temperature sensors to monitor the demand for and supply of the liquid nitrogen. With a unique insulated switching mechanism, high flow pneumatic valves, and hot gas bypass programming, the CryoWiz automatically switches sources with virtually no change in delivered cryogenic temperature. Ensuring both consistent temperature and continuous supply, the CryoWiz is ideal for critical cryogenic applications such as cryopreservation and environmental chambers

Cryogenic Liquid Manifold

Manifolds



Design Features

- **Automatic Proprietary Control Algorithm**
Ensures continuous efficient supply
- **Insulated Switching Mechanism**
Minimizes flow loss of liquid
- **High Flow Pneumatic Control Valves**
Supplies multiple freezers
- **Hot Gas Bypass**
Eliminates flow loss
- **Single Compact NEMA 12 Enclosure**
Occupies less space easy to install
- **Remote Monitoring**
USB and Ethernet communication
24,000 event date and time log
- **Oxygen Deficiency Relay Contact**
Ensures OSHA safe use
- **Local Audible and Visual Alarm**
On-board emergency monitoring
- **Optional Remote Alarm**

Materials

Enclosure	Powder coated NEMA 12
Internals	Brass bar stock
Cryogenic Relief Valves	50 PSIG (3.5 BAR) optional 1/2" FPT
Hot Gas Bypass	1/2" FPT
Maximum Inlet Pressure	35 PSIG (2.4 BAR) optional
Inlet Connection	1/2" FPT
Outlet Connection	1/2" FPT
Drain	1/2" PVC

Specifications

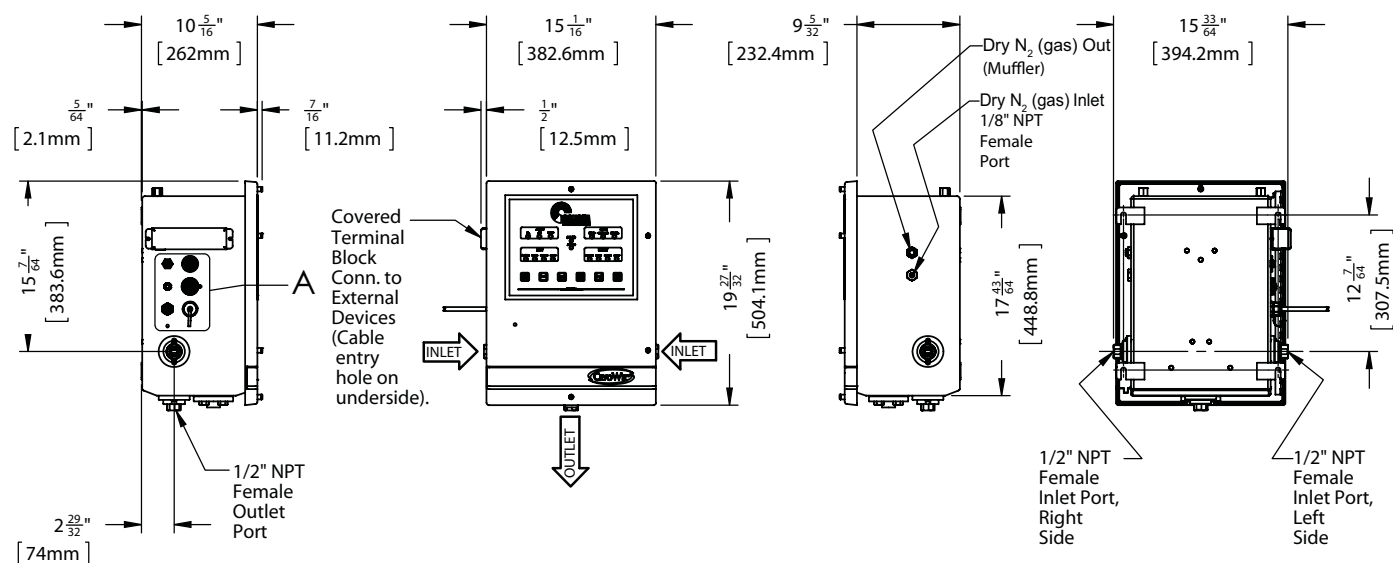
Alarm Output	1 or 5 dry contact NC
Alarm Inputs	Oxygen deficiency relay
Dry Nitrogen (Gaseous)*	105 PSIG (7 BAR) max 95 PSIG (5 BAR) min Inlet: 1/8" FNPT * Required for pneumatics
Communication Ports	USB (maintenance only) Ethernet (optional)
Power	90-264 VAC, 47-63 Hz (US, UK, European, Australian, and Chinese adapters included)
Weight	40 lbs (18 kg)

Airgas Quality Policy

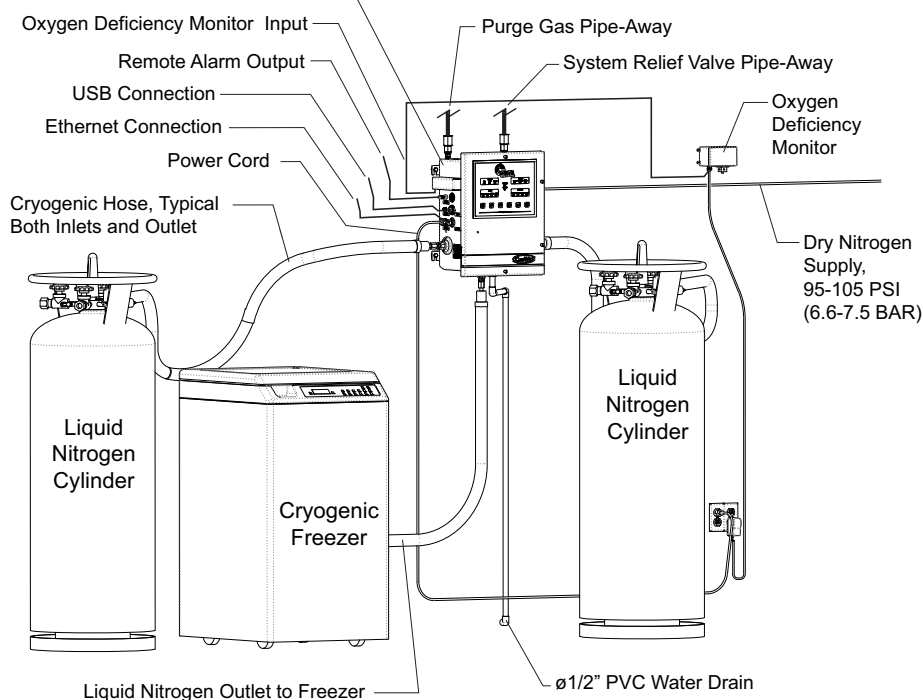
The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Specialty Gas Equipment

Airgas
an Air Liquide company



577 Series CryoWiz™



Ordering Information

Product Number	Description	Material
Y11-CP577N2	1 x 1 Liquid Nitrogen Manifold No Hose	Brass
Y11-CP577N236	1 x 1 Liquid Nitrogen Manifold w/36" Hose	Brass
Y11-CP577N248	1 x 1 Liquid Nitrogen Manifold w/48" Hose	Brass
Y11-CP577N272	1 x 1 Liquid Nitrogen Manifold w/72" Hose	Brass
Y40-DEFALARM	Oxygen Deficiency Alarm 110 VAC No Hose	

For additional hoses, configurations, options and technical support please call 1-800-939-5711

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Vacuum Jacketed Cryogenic Liquid Nitrogen Manifold for Cryogenic Freezers

Description: Airgas' stainless steel vacuum jacketed tank switcher provides a continuous liquid nitrogen supply by automatically switching to another dewar when the primary tank supplying the freezer becomes empty. This unit is specifically designed to provide cryogenic liquid nitrogen to freezers. The unit is constructed of vacuum jacketed piping and the valves are specifically designed to operate and control cryogenic liquids without large ice build ups on the system.

Liquid flows to the freezer or other device are ensured by a capacitive probe that detects actual liquid in the line, unlike some models that only sense liquid or gas temperatures.

The vacuum jacketed lines prevent dripping and sweating. Combined with an included Programmable Logic Controller (PLC) this tank switcher provides improved accuracy and cryogen control.

Vacuum Jacketed Cryogenic Changeover

CHANGEOVER PANELS



Two-Tank Version Specifications	
Manifold Dimensions	28" W x 28" H 24" D (71 cm x 71 cm x 61 cm)
Control Box Dimensions	11.5" W x 13.5" H x 6" D (29.2 cm x 34.3 cm x 15 cm)
Operating Temperature	32°F-120°F (0°C-50°C)
Enclosure and Penetrations Rating	NEMA 4X, IP65
Power Requirements	110-240 VAC, 50-60 Hz
Power Usage	200 watts @ 110 VAC 1.7 amp max.
Alarm Output	24 VDC 0.2 amp max. current

Materials	
Tubing	Stainless Steel
Relief Valves	Brass
All other wetted parts	Stainless Steel

Other versions and configurations available

Design Features

- No operator intervention for cylinder switching.
- Frost-free operation. No more puddles or water running down the walls.
- Quicker cool-down time enabling faster delivery of liquid nitrogen to cryogenic freezers or other applications.
- Easy to operate touch screen controls with simple operation and adjustments.
- Eliminates system downtime during cylinder switchout.
- Allows different pressure liquid nitrogen cylinders and VGLs.

Ordering Information

Product Number	Description
Y11-TECFAB1	Stainless steel liquid changeover 2 cylinders 1 x 1

Other versions and configurations available

Optional Parts

Product Number	Description
Y15-35308	Vacuum jacket inlet hoses ½" ID hoses 295 CGA x T-65 bayonet
Y91-23208	T-65 Bayonet clamps

Other lengths available

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



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Tri-Mix Blender

Meat Packaging

GAS MIXING SYSTEMS



Description: The Airgas Tri-Mix Blender is designed for customers utilizing carbon monoxide mixtures for meat packaging operations. The mass flow controller based system is capable of producing a 4000 ppm carbon monoxide, 35% carbon dioxide balance nitrogen mixture that is evaluated by an integrated process analyzer.

The blender also features data logging capabilities, a PLC control system and gas detectors. Options such as gas cabinets or outdoor storage buildings for carbon monoxide, changeover manifolds and back-up mass flow controllers are also available.

Specifications	
Mixture Concentrations	Nitrogen 65%, Carbon Dioxide 0-40%, Carbon Monoxide 0-4500 parts per million
Maximum Flow Rate	4000 scfh
Outlet Pressure	150 psi
Analyzer Type	Infrared for CO ₂ and CO analysis
System Operation	Tank filling (always ready) with flow matching for improved mix accuracy
Mixing method	Mass flow controllers

Design Features
Mass flow controller based mixing for accurate and repeatable blends.
PLC-based controls
Integrated process analyzer to assure important process variables
Automated, weekly calibration to a NIST traceable calibration gas
Data logging of 15 key parameters every 60 seconds
Storage tanks with flow matching capability for improved mix accuracy
Local and remote gas detection capabilities

Ordering Information			
Product Number	Mixture Range	Outlet Pressure	Maximum Flow
V89 ES2255	0-4500 ppm carbon monoxide, 0-40% carbon dioxide, 65% nitrogen	150 psi	4000 scfh

Please call 1-800-282-1524 for technical sales and support of this product.

Two-Gas PROPORTIONAL GAS BLENDERS

Description: These Two-Gas Blenders with a capacity to blend up to 700 SCFH are used to blend gases used for controlled and modified atmospheric packaging of food products. These blenders eliminate the need for premixed gases. Blending gases eliminates the percent variations found in premixed gases. Lower cost individual gases can be blended to specific percentages for the product being packaged. Controlling the blended gases will result in lower cost and more flexibility in your packaging process. On-site gas blending eliminates the need to change cylinders, regulators, flowmeters, and hoses when changing from one mixture percentage to another. Changing the percentage setting is accomplished by the simple movement of a dial. On-site gas blending also eliminates gas separation just prior to use and also eliminates gas stratification or separation that can occur when premixed cylinders are allowed to stand for periods of time before use. The blender will automatically shut down if any one of the incoming gases fall below a certain pressure level. This eliminates the possibility of operating with only one gas. Our gas blender is easy to install and operate – there are no electrical connections. It is a completely mechanical device that is adjusted by simply turning a dial. This makes quick and easy percent mixture changes possible. Tamper resistant, these blenders have a transparent Lexan™ door to protect the dial from accidental movement. This also allows the operator to monitor the setting.

Note: The photos in this catalog depict examples of food products that may be packaged using the CAP/MAP process. Not all of the food products shown were packaged using these processes or the Airgas blender.

Design Features

- Select from a variety of gas percentages to meet your packaging needs
- Mixtures are maintained with any selected proportion with no gas separation
- Mixture accuracy is unaffected when inlet pressure remains within specified limits
- Reduced set-up time eliminates the need for premixed gases
- Ideal for mixture development for food packaging
- Laboratory and research applications
- Easy to operate

PPLC Fully Automatic

GAS BLENDERS



Proportional - Two-Gas Blender - 700 SCFH/330 LPM

Specifications	
Inlet Pressure Minimum 105 PSIG Maximum 115 PSIG	7.23 Bar 7.92 Bar
Outlet Pressure, Factory Set At No Flow	80 PSIG, 5.5 Bar
Flow Rate	20-700 SCFH, 9.4-330 LPM
Inlet Connection	¼" NPT
Outlet Connection	½" NPT
Inlet Filters, Blender Protection Only PN: 803	60 Micron Nominal
Case Material	304 Stainless Steel
Weight	17 lbs./7.5 kg
Size (W x D x H)	14" x 11" x 7" (356 mm x 279 mm x 179 mm)

Two-Gas Blender with Automatic Shutdown 700 SCFH/330LM

Stock No.	Gases	Adjustment %Range	Required Inlet Pressure/Gas	Outlet Pressure Without Flow
299-029F	Nitrogen	0-100%	105 to 115 PSIG	80 PSIG
	CO ₂	100-0%	7.3-7.9 Bar	5.5 Bar

Proportional - Three-Gas Blender - 180 SCFH/85 LPM

Specifications	
Inlet Pressure Minimum 105 PSIG Maximum 115 PSIG	7.23 Bar 7.92 Bar
Outlet Pressure, Factory Set At No Flow	50 PSIG, 3.45 Bar
Flow Rate	10-180 SCFH, 4.8-85.7 LPM
Inlet and Outlet Connections	½" NPT RH Internal
Inlet Filters, Blender Protection Only PN: 3291	60 Micron Nominal
Case Material	304 Stainless Steel
Weight	17 lbs./7.5 kg
Size (W x D x H)	14" x 11" x 7" (356 mm x 279 mm x 179 mm)

Three-Gas Blenders with Automatic Shutdown 180 SCFH/85LM

Stock No.	Gases	Adjustment %Range	Required Inlet Pressure/Gas	Outlet Pressure Without Flow
299-037F	Nitrogen	0-100%	105 to 115 PSIG	50 PSIG
	Oxygen	100-0%	7.3-7.9 Bar	3.45 Bar
	CO ₂	100-0%		

Ordering Information

Model	Description	Delivery Pressure
Y11-SLP120(CGA)	brass electronic high purity changeover manifold, 2 cylinder (1x1)	25-200 psig
Y11-SLP140(CGA)	brass electronic high purity changeover manifold, 4 cylinder (2x2)	25-200 psig
Y11-SLP420(CGA)	SS electronic high purity changeover manifold, 2 cylinder (1x1)	25-200 psig
Y11-SLP440(CGA)	SS electronic high purity changeover manifold, 4 cylinder (2x2)	25-200 psig

Specialty Gases and Equipment Product Reference Guide

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Miscellaneous Equipment-Cylinder Mounting

Miscellaneous Equipment – Cylinder Mounting

Specialty Gases and Equipment
Product Reference Guide

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Cylinder Brackets and Clamps

Description: The Y99-241500 bracket is used to secure a single cylinder directly to a wall. Recessed mounting holes are located at each end of the bracket to simplify wall mounting.

The Y99-242200 bracket is used to secure a single cylinder to a workbench, lab table, or other solid support. It features a woven strap measuring 1½" (4 cm) in width by 54" (137 cm) in length.

The Y99-241000 clamp is used to secure a single cylinder directly to a wall. The clamp is constructed from heavy-gauge, die-formed steel and is cadmium-plated to prevent rusting.

The Y99-7211 single cylinder bracket is durable molded all-poly, spark-resistant construction. It offers superior rust and corrosion resistance and supports cylinders up to 10" in diameter. Heavy nylon cinch straps secure the cylinders.

The Y99-7210 two-cylinder bracket is used to secure two cylinders. Durable all-poly construction. It is corrosion, rust and spark resistant with heavy nylon cinch straps to support cylinders up to 10" in diameter.

The Y99-G200 two-cylinder wall-mount bracket is made of heavy-gauge steel and finished in chemical-resistant epoxy. It has non-marring polyethylene edge guards for superior impact and chemical resistance. It supports bottles up to 12" in diameter.

The Y99-G110 single-cylinder adjustable bracket is made of glass-reinforced polymers and has a 1.5" polypropylene strap and buckle. It also has a steel

Accessories

MISCELLANEOUS EQUIPMENT



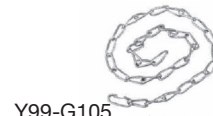
Y99-241500



Y99-242200



Y99-G200



Y99-G105



Y99-241000



Y99-G110



Y99-G275

chain with bitsnap enclosure. Fits any cylinder bottle from 3.5" to 14". Can be mounted to any vertical surface.

The Y99-G105 is a replacement chain for any bracket.

The Y99-G275 two-cylinder wall/floor stand is made of heavy-gauge steel and finished in chemical-resistant epoxy. It has non-marring polyethylene edge guards. Cylinders are secured by heavy polypropylene straps with steel cinch buckles. Supports bottles up to 12" in diameter.



Y99-7211

Ordering Information		
Product Number	Description	Material
Y99-241500	Cylinder Wall Bracket with 54" Strap	Cast Metal
Y99-241500FR	Cylinder Wall Bracket with Fire Resistant 54" Strap	Cast Metal
Y99-241500CA*	Cylinder Wall Bracket with 54" Strap	Cast Metal
Y99-242200	Cylinder Bench Bracket with 54" Strap	Steel Painted
Y99-241000	Cylinder Clamp for Tank Diameter of 7"- 9" (18-23cm)	Steel Painted
Y99-STRAP72	Black Replacement 72" Strap	Nylon
Y99-FRSTRAP	Airgas Fire Resistant 54" Strap	Nylon
Y99-7210	Two-Cylinder Bracket with Nylon Strap	Composite
Y99-7211	Single-Cylinder Bracket with Nylon Strap	Composite
Y99-7214	End Cap for Modular Cylinder Bracket	Composite
Y99-7215	Center Section for Modular Cylinder Bracket	Composite
Y99-G200	Two-Cylinder Wall Mount Bracket	Steel Epoxy Coated
Y99-G110	Single-Cylinder Adjustable Bracket	Polymer
Y99-G105	Chain Set	Steel
Y99-G275	Two-Cylinder Wall/Floor Stand	Steel Epoxy Coated

*With Chain Set to Meet California Cylinder Restraint Code

MISCELLANEOUS EQUIPMENT

Accessories

Small Cylinder Bases/Stands



Description: The Y99-244000 large cylinder base is constructed of lightweight, durable plastic and is designed for use with 200 and 300 series (9" diameter) cylinders.

The Y99-243500 medium cylinder stand is constructed of durable plated steel, and is designed for use with 10 and 35 series (4" – 7³/₈" diameter) cylinders.

The Y99-243000 small cylinder base is constructed of lightweight, durable plastic and is designed for use with 7 and 10 series (4" diameter) cylinders.

The Y99-LB5 base is constructed of lightweight aluminum and is designed to safely secure lecture bottles.

The Y99-G181 single cylinder floor stand safely supports 4" – 10" diameter cylinders using a combination of cinch buckle polypropylene strap and 10-gauge steel bar.

The Y99-G831 molded bottle stand is made of durable polyurethane and is for use with 4" diameter medical oxygen gas bottles. Non-tip stand with nylon set screws to hold bottles in place.

Ordering Information

Product Number	Airgas Cylinder Sizes Supported
Y99-244000	300, 200, 9"
Y99-243500	35, 10, 4" - 7 ³ / ₈ "
Y99-243000	10, 7, 4"
Y99-LB5	LB, LBX
Y99-G181	4"-10"
Y99-G831	4 inch

Gas Cylinder Stands and Supports

Description: The Y99-G837 Cylinder Stand supports bottles from 5-inch to 6.75-inch diameter using 14-gauge steel frame and rings and nylon set screws. Designed to free stand or mount in place, the unit is powder coated for years of service.

Y99-G181 stand uses a strap and compression clamp system to secure cylinders in an upright orientation. Powder painted 7- and 11-gauge steel constructed.

Y99-G400 rack safely stores four cylinders from 4-inch to 12-inch diameter. These racks use two 54-inch long by 1½-inch wide poly straps for each cylinder station to secure cylinders. Edges are protected with steel reinforced vinyl edge guarding to maintain and protect your cylinders and provide extra grip. Built from heavy gauge (.120-inch thick) welded steel with powder paint finish. Units bolt to floor in four places using your fasteners.

Y99-600 shares features with the Y99-400 rack with six (Y99-600) or eight (Y99-800) cylinder stations.

Accessories

MISCELLANEOUS EQUIPMENT



Y99-G400



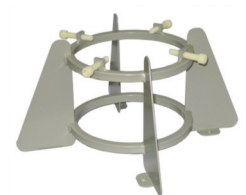
Y99-G600



Y99-G800



Y99-G181



Y99-G837

Ordering Information

Product Number	Cylinder Capacity	Description
Y99-G181	1	Single-Cylinder Stand, 5-10-inch diameter capacity
Y99-G837	1	Single-Cylinder Stand, 5-6.75-inch diameter capacity
Y99-G400	4	Four-Cylinder Rack, 4-12-inch diameter capacity
Y99-G600	6	Six-Cylinder Rack, 4-12-inch diameter capacity
Y99-G800	8	Eight-Cylinder Rack, 4-12-inch diameter capacity

Stainless Steel Brackets and Hand Truck

Accessories

MISCELLANEOUS

Description: The Y99-G100SS (Single Cylinder) and Y99-G200SS (Two Cylinder) Wall-mounted 12-Gauge Type 304 Stainless Steel cylinder brackets are used to secure cylinders to the wall in environments where carbon steel brackets would be subject to chemical attack or in clean room type environments. These brackets use 54-inch long by 1½-inch wide poly straps with nylon snap buckles to secure cylinders. Edges are protected with steel reinforced vinyl edge guarding to maintain and protect your cylinders and provide extra grip. Supports hold cylinders from 4.0- to 12.0-inch diameter.

Y99-G150SS features the same construction as the Y99-G100SS, but is designed to mount to a table or bench up to 3 inches thick using two compression clamps with vinyl protected surfaces to secure bracket in place.

Y99-G902SS Stainless Steel Hand Truck: Type 304 Stainless Steel base, frame and cylinder supports with 14 gauge continuous loop handle, fully welded. Unit safely transports cylinders up to 11-inch diameter. Eight inch polypropylene wheels are weight-rated 1000 lb. each and ride on solid stainless steel axle with stainless steel hardware. Cylinder supports use a 54-inch long by 1½-inch wide poly strap with nylon snap buckles to secure cylinder.



Y99-G100SS



Y99-G200SS



Y99-G150SS



Y99-G902SS

Ordering Information

Product Number	Description
Y99-G100SS	Single-Cylinder Stainless Steel Wall Bracket
Y99-G150SS	Single-Cylinder Stainless Steel Bench Mount Bracket
Y99-G200SS	Two-Cylinder Stainless Steel Wall Bracket
Y99-G902SS	Single-Cylinder Stainless Steel Hand Truck

Gas Cylinder Transport and Storage Pallets

Description: Six models and sizes designed for transport of multiple cylinders. Y99-G2020 will fit 21 cylinders of 300 Cft capacity or four 23-inch Cryo cylinders, Y99-G2014 holds 12 cylinders or two Cryo bottles and Y99-G2008 fits six cylinders or a single Cryo bottle. A 10,000-lb. rated ratchet strap, included, attaches at three different heights. Steel construction with textured powder paint finish to provide nonskid surface. Two-way, fully enclosed forklift channels. Two-, four- and six. Cylinder Pallets are sized for cylinders 6 to 12 inches in diameter and also use the full-length 2-inch x 7.75-inch fork channels in the larger pallets. The two through six-cylinder models use two nylon strap and steel buckles for each cylinder to secure cylinders to the pallets.

Accessories

MISCELLANEOUS EQUIPMENT



Y99-G2014



Y99-G2008



Y99-G2020



Y99-G251



Y99-G651



Y99-G451

Ordering Information

Product Number	Cylinder Capacity	Description
Y99-G251	2	Two-Cylinder Forklift Pallet
Y99-G451	4	Four-Cylinder Forklift Pallet
Y99-G651	6	Six-Cylinder Forklift Pallet
Y99-G2008	8	Cylinder Pallet 8-cyl (300 CFT) capacity or 1 cryo
Y99-G2014	12	Cylinder Pallet 12-cyl (300 CFT) capacity or 2 cryo
Y99-G2020	21	Cylinder Pallet 21-cyl (300 CFT) capacity or 3 cryo

Cylinder Support Racks

Steel Tube Style

Description: The Airgas® Y99-GSTD Series steel tube style cylinder support racks are available from single cylinder to eighteen (18) cylinder racks. All support racks are made of heavy, 11-gauge square tube steel construction welded 4 sides at each intersection. All exposed ends are poly capped. Units have welded plated chain with bit snaps at 2 levels per cylinder. All units meet UFC1985, NFPA, UBC, and UL construction requirements. Rated for Siemic Zone rated 4.

Cylinder Rack

MISCELLANEOUS EQUIPMENT



Ordering Information

Product Number	Cylinder Sizes Supported	Material
Y99-GSTD1X1	Single Cylinder Restraints	Powder Coated Steel
Y99-GSTD1X2	Two Cylinder Restraints	Powder Coated Steel
Y99-GSTD1X3	Three Cylinder Restraints	Powder Coated Steel
Y99-GSTD2X2	Two Cylinder Restraints, Two Deep	Powder Coated Steel
Y99-GSTD4X2	Four Cylinder Restraints, Two Deep	Powder Coated Steel
Y99-GSTD3X3	Three Cylinder Restraints, Three Deep	Powder Coated Steel

* Other configurations available (call 1-800-939-5711 for part # and price).

Cylinder Support Rack & Ramp

Polymer

Description: The Y99-7202 is a six-cylinder rack. It is an easily moveable unit that can be lifted with a forklift or crane. It is sized to move through standard doorways and the cylinders are secured with heavy nylon straps. The Y99-7202 has durable all-poly, spark resistant, rust and corrosion resistant construction that supports cylinders up to 10-inch diameter.

The Y99-7203 six-cylinder rack ramp attaches to the polymer cylinder six-cylinder rack (Y99-7202) for easy handling of cylinders. Made of durable all-poly, spark resistant, rust and corrosion resistant construction it can handle a load bearing capacity up to 600 pounds.

Cylinder Rack

MISCELLANEOUS EQUIPMENT



Ordering Information

Product Number	Cylinder Sizes Supported	Material
Y99-7202	Six Pack Polymer Cylinder Rack	Polymer Composite
Y99-7203	Six Pack Polymer Cylinder Ramp	Polymer Composite

MISCELLANEOUS EQUIPMENT

Accessories

Cylinder Carts and Trucks



Y99-231100



Y99-231300



Y99-231500



Y99-231400



Y99-231200

Description: Our cylinder carts and trucks are designed for transporting compressed gas cylinders.

Model Y99-231100 is designed for safely transporting single cylinders.

Model Y99-231200 is designed for transporting single cylinders and features retractable rear wheels for added safety and maneuverability.

Model Y99-231300 is designed to transport two cylinders and features heavy-duty construction, rigid rear carriage supports and high load capacity.

Model Y99-231400 is designed for transporting single cylinders up to 20½" in diameter.

Model Y99-231500 is a patented liquid gas transport system developed for safer handling of cryogenic cylinders up to 1,000 lbs gross weight. Simply align the hook assembly directly in front of the cylinder eyelet hole and turn the worm gear assembly until the desired height is reached. The patented mechanical lift mechanism allows virtually anyone to safely and easily lift and move a dewar container.

Model Y93-NMRCART is designed for use in MRI applications. Constructed of durable, non-magnetic materials.

Equipment

Ordering Information	
Product Number	Airgas Cylinder Sizes Supported
Y99-231100	300, 200
Y99-231200	300, 200
Y99-231300	300, 200, 3HP, 2HP
Y99-231400	Cryogenic Containers
Y99-231500	Cryogenic Containers
Y93-NMRCART	300, 200

MISCELLANEOUS EQUIPMENT

Accessories

Cylinder Floor Savers



Description: These floor savers were designed to protect and preserve tile, wood, carpeted and painted floors from bacteria, rust, corrosion and condensation caused by industrial and medical gas cylinders and liquid dewars. They are ideal for biotech, pharmaceutical, medical and electronic work areas.

The floor savers are constructed of a custom-blended, chemical-resistant, high-impact thermoplastic crafted to eliminate the need to routinely clean and buff floors around cylinders and dewars.

Floor savers, with their moisture collection reservoir, provide a protective barrier between the cylinders and the floor. They prevent transfer of cylinder or dewar contamination and moisture to the work area, providing a safer work environment.

Cleaning solvents, moisture and water will not adversely affect the integrity of the floor saver.

Ordering Information

Product Number	Specification	Cylinder Sizes Supported
Y99-LT10	<ul style="list-style-type: none"> Overall Size – 11¹/₄" x 11¹/₄" Reservoir – 10" diameter x ³/₈" Capacity – 1 pint Weight – approximately 1 lb Color – tan 	10" Diameter or Smaller
Y99-LT22	<ul style="list-style-type: none"> Overall Size – 23¹/₂" x 23¹/₂" Reservoir – 22" diameter x ⁵/₈" Capacity – 4 quarts Weight – approximately 6 lbs Color – tan 	Dewars 22" or Smaller
Y99-LT33	<ul style="list-style-type: none"> Overall Size – 32" x 33" Reservoir – 30" x 30" x ³/₄" Capacity – 5 quarts Weight – approximately 9 lbs Color – tan 	230L Dewars w/Caster Base

Cylinder Wrenches

Accessories

MISCELLANEOUS EQUIPMENT

Description: The Y99-WRENCH is a combination cylinder wrench and can accommodate nine different fittings: 1/4", 7/16", 3/8", 1/2", 9/16", 11/16", 1", 1 1/16", 1 1/8".

The Y99-38WRENCH square-stem valve wrench is designed and recommended for use on cylinder valves with a 3/8" square stem, and a 1 1/4" valve packing nut. This type of valve is typical on cylinders containing ammonia, chlorine, hydrogen sulfide, hydrogen chloride, hydrogen fluoride, and nitrogen trifluoride.

The Y99-CW1 cylinder cap wrench utilizes a durable nylon strap for loosening and tightening stubborn cylinder caps. The strap design prevents accidental opening of the cylinder valve when loosening the cylinder cap.



Ordering Information	
Product Number	Description
Y99-38WRENCH	Square-Stem Valve Wrench
Y99-WRENCH	Combination Wrench
Y99-CW1	Cylinder Cap Wrench
Y99-CAPWRENCH	Cylinder Cap Wrench Hook Style

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Dial Models

Description: The pressure and temperature of a liquefied gas remains constant as material is withdrawn, as long as a liquid phase remains in the cylinder. Once the liquid phase is exhausted, the pressure drops rapidly and the cylinder empties. This characteristic renders a cylinder pressure gauge virtually useless as a means of estimating the time to total supply depletion. One way to monitor the contents of a cylinder containing a liquefied gas is by weight.

The Model 280 cylinder scale is designed to give a positive indication of the amount of product remaining in the cylinder. Simply subtract the tare weight of the cylinder so that the net contents can be read directly. The optional non-skid ramp makes loading and unloading cylinders convenient, quick, and easy.

These scales are recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane, and heavier hydrocarbon gases.

Cylinder Scales



MISCELLANEOUS EQUIPMENT



Specifications

Tare Weight Range	0-140 lbs
Net Weight Range	0-140 lbs
Total Weight Capacity	280 lbs (5-lb increments)
Readability	1 lb By Estimation
Dimensions (WxHxD)	10 $\frac{3}{4}$ " x 10 $\frac{1}{4}$ " x 2"

Ordering Information

Product Number	Description
Y40-280	Scale with Dial Readout
Y40-280R	Optional Ramp for Y40-280 10" x 5 $\frac{1}{2}$ " x 2"

Digital Models

Description: The pressure and temperature of a liquefied gas remains constant as material is withdrawn, as long as a liquid phase remains in the cylinder. Once the liquid phase is exhausted, the pressure drops rapidly and the cylinder empties. This characteristic renders a cylinder pressure gauge virtually useless as a means of estimating the time to total supply depletion. One way to monitor the contents of a cylinder containing a liquefied gas is by weight.

Specifications	
Tare Weight Range	0-150 lbs
Net Weight Range	0-150 lbs
Total Weight Capacity	0-300 lbs
Alarm Set Point	0-150 lbs
Accuracy	±0.5% of Full Scale
Control Box Dimensions (WxHxD)	Control Box - 8" x 2.6" x 7 $\frac{3}{4}$ "
Platform Dimensions (WxHxD)	Model 300 - 15 $\frac{3}{4}$ " x 17 $\frac{1}{2}$ " x 1 $\frac{1}{4}$ " Model 301 - 20" x 20 $\frac{1}{2}$ " x 1 $\frac{1}{4}$ "

Cylinder Scales

MISCELLANEOUS EQUIPMENT

The series 300 cylinder scales are designed to give a positive indication of the amount of product remaining in the cylinder. It allows the user to subtract the tare weight of the cylinder so that the net contents can be read directly.

These scales are recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane, and heavier hydrocarbon gases.

Alarm capable options are available.

Ordering Information

Product Number	Description
Y40-300	Scale with readout w/ 15 $\frac{3}{4}$ " x 17 $\frac{1}{2}$ " platform
Y40-301	Scale with readout w/ 20" x 20 $\frac{1}{2}$ " platform
Y40-2310D	Scale with readout w/15 $\frac{3}{4}$ " x 17 $\frac{1}{2}$ " platform, includes one alarm contact for use with local or remote alarms

Portable Run-A-Weigh Scale

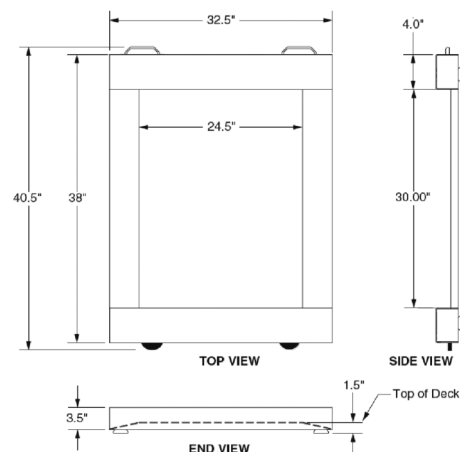
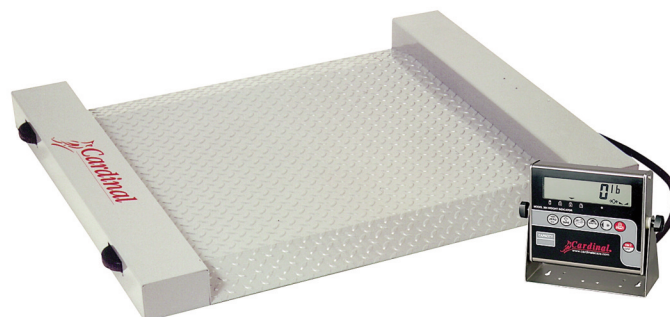
Liquid Cylinder Scales

MISCELLANEOUS EQUIPMENT

Description: Weighing in at less than 100 pounds and featuring built-in handles and wheels, the Run-A-Weigh scale is easy to lift and roll to wherever needed. Whether it's multiple weighing locations at a single facility or the need to take a scale to special job sites, the Run-A-Weigh gives you true portability.

Designed for weighing "on-the-move," this portable scale features a Digital Weight Indicator that can be mounted on the wall or a desk for convenient viewing. Setup is simple and quick with the Run-A-Weigh's self-aligning feet. Heavy-duty construction, large checkered safety plate platform with integral ramps, and the 500-lb or 1,000-lb capacity make this the perfect scale for weighing liquefied compressed gas cylinders or cryogenic liquid containers – anywhere!

- Available in all Stainless Steel Construction as special order
- NEMA 4X/IP66 enclosures available as special order



Specifications		
Capacity	Y40-RW1000	1000-lb x 0.5-lb/450 kg x 0.2 kg
	Y40-RW500	500-lb x 0.2-lb/225 kg x 0.1 kg
Dimensions:		32.5"W x 40.5"D x 3.5"H
Platform:		24.5"W x 30"D w/ checkered safety plate
Construction:		Heavy-duty steel w/baked-on powder coat paint finish
Shipping Weight:		105-lb

Indicator Specifications	
Display:	5 digit, 7 segment, 0.1" high LCD
Units Conversion:	Keypad selectable
Enclosure:	General purpose, Stainless Steel
Power:	Six "C" cell or NiCad Batteries, standard 12 VDC (115VAC 60 Hz adapter) or 115 VAC 60 Hz
Output:	RS-232
Zero Tracking:	0 to 4% selectable ± 6 or 1d selectable 4% max range
Temperature Range:	+14 F to +104 F (-10 C to +40 C)

Ordering Information

Product Number	Description	Maximum Capacity
Y40-RW1000	Portable Run-A-Weigh Scale for liquefied compressed or cryogenic liquid cylinders	1,000-lbs
Y40-RW500	Portable Run-A-Weigh Scale for liquefied compressed or cryogenic liquid cylinders	500-lbs

Gas Flash Arrestors

Description: Airgas® flash arrestors provide 3-way protection to prevent flashback of fuel gas and oxygen. A built-in check valve stops reverse gas backflow. The flash arrestor diverts the flashback flame into three feet of tubing where the heat from any possible explosion is absorbed and resulting fire may be extinguished.

The shockwave preceding the flashback flame closes and locks the flash arrestor shutoff valve, eliminating gas feeding to any residual sparks or flame.

Airgas flash arrestors comply with relevant OSHA and NFPA codes. Factory Mutual-approved with gases listed below.

Arrestors

MISCELLANEOUS EQUIPMENT



Maximum Service Pressure

Oxygen	143 psig
Acetylene	15 psig
Propane	50 psig
Hydrogen	50 psig
Natural Gas	50 psig
Methane	50 psig

Materials

Body	Brass or Stainless Steel
Seat	Butyl Rubber
O-Rings	Silicon Base Rubber
Internal Parts	Brass and Steel

Ordering Information

Product Number	Gas Service	Body	Connections
Y33-1FA44	Fuel, Oxygen	Brass	1/4" FNPT x 1/4" FNPT
Y33-1FALH	Acetylene	Brass	9/16" - 18 LHF x 9/16" LHM
Y33-1FARH	Oxygen	Brass	9/16" - 18 RHF x 9/16" RHM
Y33-1FA44SS	Fuel	Stainless Steel	1/4" FNPTX x 1/4" FNPT

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Electric Heaters

Description: These electric gas heaters are designed to reduce regulator icing as gas is withdrawn from carbon dioxide or nitrous oxide cylinders. They are thermostatically controlled with set points at 165° F (on) and 185° F (off).

Units for carbon dioxide and nitrous oxide are equipped with CGA connections for assembly between the cylinder valve and pressure regulator. They are also available with 1/4" FNPT connections for use with non-reactive gases.

Note: These heaters are not suitable for use with flammable gases.

Automatic Electric Heaters

For Compressed Gas Cylinders or Cryogenic Dewars

Description: The Airgas® Automatic Electric Heaters are used to vaporize or warm gases (typically CO₂) prior to pressure regulation. Used in welding, bottling plants, wineries, foundries, food packaging, semiconductor/cleanroom applications and anywhere cold gas is a problem.

These heaters are used when the flow rate required is greater than the cylinder can support through normal vaporization. These heaters are a cost-effective solution verses using ambient vaporizers.

The Airgas® Automatic Electric Heaters are C.S.A. approved and have a one-year guarantee on materials and workmanship.

Capacity	Design Features
Capacity (for Carbon Dioxide, CO₂)** Heating: 1,000 cfm; 17 cfm; 467 L/min; 115 lbs/hr (Heating valves are based on initial gas temperature of 0° F and outlet temperature of 170° F) Vaporizing: 184 cfm; 3 cfm; 84 L/min; 22 lbs/hr (Vaporizing valves are based upon initial liquid temperature of 0° F and outlet temperature of 170° F) <small>** Capacities for other gases will vary, depending on their specific heat.</small>	Explosion proof heater completely dry – heat exchange medium is aluminum. Prevents regulator freeze-up unlike ambient devices, not affected by adverse atmospheric conditions. Thermostatically controlled can be left on, even under no-flow conditions. Double protection against thermal or electrical overload heavily insulated – cabinet remains "cool". Continuous high-pressure tubing – no internal joints flow can be in either direction, without loss of efficiency.

Ordering Information			
Product Number	Voltage	Flow Rate	Connections
Y99-419000	120 VAC	1,000 cfm Max. heating; 184 cfm Max. vaporizing (outlet 170° F)	5/16" SAE Flare
Y99-419001	N/A	Manifold Block	N/A

Heaters

MISCELLANEOUS EQUIPMENT



Specifications/Materials	
Voltage	110 Volts/160 Watts
Materials	Steel Case, Brass Expansion Chamber
Weight	2 lbs
Ordering Information	
Product Number	Application
Y99-HEATER320	Carbon Dioxide
Y99-HEATER326	Nitrous Oxide
Y99-HEATERFF	Inert Gases (1/4" FNPT x 1/4" FNPT)

Heaters High Flow

MISCELLANEOUS EQUIPMENT



Y99-419001

Y99-419000

Specifications/Materials	
Maximum Operating Pressure	2,500 psig (copper); 4,600 psig (stainless steel)
Thermostat	Internal, factory set at 170° optional adjustable
Heating Elements	1000 Watt, 240/120VAC, 4.2/8.3 amps, 6'3"-wire UL/CSA Cord
Weight	13 lbs.
Dimensions (H x W x D)	11" H x 5.5" W x 4.5" D
Inlet	45° SAE flare
Outlet	45° SAE flare
Mounting	Holes 3" On Center
Body	Powder coated steel box
Fittings	1/4" MNPT Brass (standard)
Tubing	Copper – 5/16" x .049 continuous

Miscellaneous Equipment-Gas Filters

Miscellaneous Equipment – Gas Filters

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions

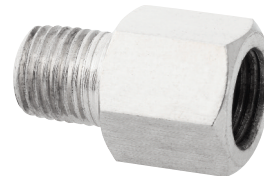
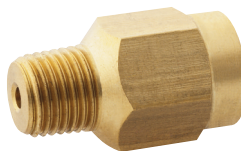


Economy Models

Description: The LF400 Series in-line gas filters are designed specifically to be used as a standard line filter or pre-filter. They may be easily installed into a pressure regulator, flowmeter, or valve body for inlet stream protection. This filter can be installed into any standard Airgas® regulator before shipping.

Gas Filters

MISCELLANEOUS EQUIPMENT



Specifications

Body	Brass or 304 Stainless Steel
Element	316L Stainless Steel
Nominal Micron Rating	10-, 40-Micron
Maximum Operating Pressure	Brass – 1,500 psig Stainless Steel – 5,000 psig

Ordering Information

Product Number	Material	Inlet	Outlet	Micron Size
Y40-LF401FM	Brass	1/4"FNPT	1/4"MNPT	10
Y40-LF402FM	Brass	1/4"FNPT	1/4"MNPT	40
Y40-LF403FM	304 SS	1/4"FNPT	1/4"MNPT	10
Y40-LF404FM	304 SS	1/4"FNPT	1/4"MNPT	40

High-Purity, Non-Corrosive

Description: The Airgas® 700 Series high-purity Depth Gas Filters are the workhorses of laboratories and many high-purity industrial processes. They are routinely used in critical gas lines and as pre-filters to extend the lifetime of more expensive filtration units. They are designed to provide high filtration efficiency at an economical cost.

The Airgas® 800 Series high-purity Membrane Gas Line Filter has a PTFE medium that efficiently traps particles down to 0.003 microns. The 800 Series may be installed in gas lines supplied by cylinder or bulk sources.

The Airgas® 1700 Series has all stainless steel construction with excellent flow characteristics for such a compact design. The 1700 Series is 100% pressure tested, integrity tested and helium leak checked. All filters are vacuum packed in a clean room. The 1700 Series filters are available with Butt Weld, Gasket Seals and Compression Fittings.

The Airgas® 800, 900 and 1700 Series in-line filters are intended for the particulate filtration of ultra-high-purity semiconductor grade gases. These filters are designed specifically to remove sub-micron-size particulates from process gases. They provide guaranteed 0.003-micron, absolute filtration efficiently and long service. Unlike other gas line filters, the Airgas® high-purity non-corrosive series filters will not shed particles. The 316L stainless steel housing withstands high operating pressures and provides maximum safety and application compatibility. All filters are 100% helium leak tested to 10⁻⁹ atm cc/sec.

Gas Filters

MISCELLANEOUS EQUIPMENT



Specifications		
Filtration Rating		
700 Series		100% @ 0.01 microns
800 & 900 Series		100% @ 0.003-microns
1700 Series		100% of all particles
Max Operating Pressure		
700 Series		250 psig
800 Series		750 psig
900 & 1700 Series		3,000 psig
Operating Temperature		
700, 800, 900 & 1700 Series		250° F
Materials		
Filter		
700 Series		Unbindered Glass Fiber / 316 K Fiber Mesh
800 Series		PTFE/Polypylene-supported
900 Series		PTFE/FEP PTFE-supported
1700 Series		Sintered Stainless Steel
Housing		
700, 800, 900 & 1700 Series		316L Stainless Steel
LF915C		Hastelloy®
Seal	800 & 900 Series	Viton® O-Ring (PTFE for ammonia)
Finish (inside)		
700 Series		20 Ra
800 & 900 Series		10 Ra
1700 Series		7 Ra

Ordering Information

Product Number	Housing Materials	Max. Operating Pressure (psig)	Fittings (Inlet/Outlet)	Dimensions (inches)	Max. Flow (lpm)
Y40-LF8118P	316L Stainless Steel	750	1/2" Compression	5.81" x 2.0"	300 lpm
Y40-LF815P	316L Stainless Steel	750	1/4" M Gasket Seal	5.56" x 2.0"	300 lpm
Y40-LF814P	316L Stainless Steel	750	1/4" F Gasket Seal	5.81" x 2.0"	300 lpm
Y40-LF911	316L Stainless Steel	3,000	1/4" Compression	2.88" x 1.0"	30 lpm
Y40-LF915	316L Stainless Steel	3,000	1/4" M Gasket Seal	3.31" x 1.0"	30 lpm
Y40-LF915C*	Hastelloy®	3,000	1/4" M Gasket Seal	3.31" x 1.0"	30 lpm
Y40-LF1728*	316L Stainless Steel	3,000	1/4" FNPT	2.68" x 1.5"	100 lpm
Y40-LF1711*	316L Stainless Steel	3,000	1/4" Compression	3.20" x 1.5"	100 lpm
Y40-LF1712*	316L Stainless Steel	3,000	1/4" Gasket Seal M/F	3.31" x 1.5"	100 lpm
Y40-LF1713*	316L Stainless Steel	3,000	1/4" Gasket Seal F/M	3.31" x 1.5"	100 lpm
Y40-LF1714*	316L Stainless Steel	3,000	1/4" Gasket Seal F/F	3.31" x 1.5"	100 lpm
Y40-LF1715*	316L Stainless Steel	3,000	1/4" Gasket Seal M/M	3.31" x 1.5"	100 lpm
Y40-LF1750BW*	316L Stainless Steel	3,000	1/4" Butt Weld	3.0" x 1.5"	100 lpm

* 316L Housing with sintered stainless steel

High-Purity Corrosive Series

3700 Filter Series

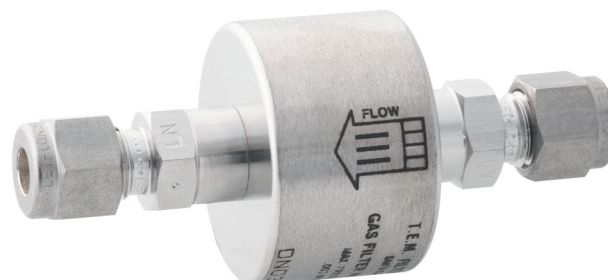
Description: The Airgas® 3710, 3740 and 3770 Filter Series for high-purity corrosive gases are specifically designed for the filtration of anhydrous corrosive gases, (less than 1 ppb).

This sintered nickel fiber media has excellent flow rates at low differential pressures.

Note: Preconditioned units offer the following "out of bag" features: No more than 1 particle/ft³; less than 10 ppb THC; less than 10 ppb moisture.

Gas Filters

MISCELLANEOUS EQUIPMENT



Design Features

99.999999% Removal rating at rated flow

Internal Finish is 7 Ra

100% Helium leak tested to 10–9 atm cc/sec

Available preconditioned

All metal construction has excellent bake-out characteristics

Specifications	
Filtration Ring	100% @ 0.003 microns and larger
Max Operating Pressure	1,000 psig
Operating Temperature	250° F

Materials	
Filter	High-flow Sintered Nickel Fiber
Housing	316L Electropolished Stainless Steel
Seal	PTFE-Coated O-ring
Finish (inside)	7 Ra

Ordering Information					
Product Number	Housing Materials	Max Operating Pressure (psig)	Connections or Fittings (Inlet/Outlet)	Dimensions (inches)	Max Flow (lpm)
Y40-LF3771	316L Stainless Steel	1,000	1/4" Compression	2.88" x 1.0"	30 lpm
Y40-LF3772	316L Stainless Steel	1,000	1/4" Gasket Seal M/F	3.31" x 1.0"	30 lpm
Y40-LF3773	316L Stainless Steel	1,000	1/4" Gasket Seal F/M	3.31" x 1.0"	30 lpm
Y40-LF3774	316L Stainless Steel	1,000	1/4" Gasket Seal F/F	3.31" x 1.0"	30 lpm
Y40-LF3775	316L Stainless Steel	1,000	1/4" Gasket Seal M/M	3.31" x 1.0"	30 lpm
Y40-LF3750	316L Stainless Steel	1,000	1/4" Butt Weld	1.75" x 1.0"	30 lpm
Y40-LF3711	316L Stainless Steel	1,000	1/4" Compression	2.88" x 1.5"	100 lpm
Y40-LF3712	316L Stainless Steel	1,000	1/4" Gasket Seal M/F	3.31" x 1.5"	100 lpm
Y40-LF3713	316L Stainless Steel	1,000	1/4" Gasket Seal F/M	3.31" x 1.5"	100 lpm
Y40-LF3714	316L Stainless Steel	1,000	1/4" Gasket Seal F/F	3.31" x 1.5"	100 lpm
Y40-LF3715	316L Stainless Steel	1,000	1/4" Gasket Seal M/M	3.31" x 1.5"	100 lpm
Y40-LF3751	316L Stainless Steel	1,000	1/4" Butt Weld	1.75" x 1.5"	100 lpm
Y40-LF3728	316L Stainless Steel	1,000	1/4" FNPT	2.68" x 1.5"	100 lpm
Y40-LF3741	316L Stainless Steel	1,000	1/4" Compression	2.88" x 2.0"	150 lpm
Y40-LF3742	316L Stainless Steel	1,000	1/4" Gasket Seal M/F	3.31" x 2.0"	150 lpm
Y40-LF3743	316L Stainless Steel	1,000	1/4" Gasket Seal F/M	3.31" x 2.0"	150 lpm
Y40-LF3744	316L Stainless Steel	1,000	1/4" Gasket Seal F/F	3.31" x 2.0"	150 lpm
Y40-LF3745	316L Stainless Steel	1,000	1/4" Gasket Seal M/M	3.31" x 2.0"	150 lpm
Y40-LF3752	316L Stainless Steel	1,000	1/4" Butt Weld	1.75" x 2.0"	150 lpm

MISCELLANEOUS EQUIPMENT

Gas Filters

High Performance



Description: The LF410 and LF420 Series in-line gas filters are designed specifically to remove sub-micron-size particulates from process gases. They provide guaranteed 0.003-micron, absolute filtration efficiency and long service. Unlike other gas line filters, the LF410 and LF420 Series filters will not shed particles. The 316L stainless steel housing withstands high operating pressures and provides maximum safety and application compatibility.

Specifications	
Medium	LF410 - PTFE Polypropylene-Supported LF420 - PTFE PFA PTFE-Supported
Housing	316L Electro polished Stainless Steel
Seal	PTFE-Coated O-Ring
Filtration Rating	100% @ 0.003-Micron Level

Ordering Information			
Product Number	Max Pressure (psig) @ 250°F	Dimensions (inches)	Connections (inlet/outlet)
Y40-LF828P	750	5.19" x 2.20"	1/4" FNPT
Y40-LF811P	750	5.56" x 2.20"	1/4" Compression
Y40-LF815P	750	5.56" x 2.20"	1/4" MVFS
Y40-LF814P	750	5.56" x 2.20"	1/4" FVFS
Y40-LF911	3,000	3.31" x 0.75"	1/4" Compression
Y40-LF915	3,000	3.31" x 0.75"	1/4" MVFS

VFS is the term used for "Vacuum Face Seal."

MISCELLANEOUS EQUIPMENT

Gas Filters



Design Features

- Design specifically for Atomic Absorption Instrumentation
- Protects microcomputer gas controls
- Ensures a clean, contaminant-free flame
- Ensures consistent quality of compressed air oxidant and fuel gas
- Convenient, turnkey system
- Services a single Atomic Absorption

Specifications

Inlet Pressure Range (compressed air)	15–125 psig
Max Inlet Pressure (acetylene)	15 psig max. working pressure
Recommended Inlet Air Temperature	< 78° F (26° C)
Ambient Operating Temperature	40° F–100° F (4° C–38° C)
Dimensions (WxDxH)	11" W x 8" D x 10" H (28cm x 20cm x 25cm)
Weight	10 lbs. (4.5 kg)
Inlet/Outlet (compressed air)	1/4" FNPT
Inlet/Outlet (acetylene)	9/16–18 LH ("B" size)

Ordering Information

Product Number	Flow Rate (cc/min.)	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)
Y80-73100	2,000	125	90

Atomic Absorption Acetylene

Description: The Airgas® Atomic Absorption Acetylene Gas Purifier is a completely engineered wall mountable system designed to purify gases commonly used with Atomic Absorption Spectrophotometers. This purifier consists of two independent filtration systems. The first system is designed to purify the compressed air (oxidant) with two stages of high efficiency coalescing filtration. These filters will remove all oil, water and particulate matter down to 0.01 micron.

The second filtration system is designed to purify the acetylene gas. This system removes liquid acetone and solid particulate from the gas. The purifier protects the microcomputer gas controls and Atomic Absorption burner assembly from contamination and corrosion. In addition, the acetylene filter has an integral flashback arrestor, meeting all OSHA requirements, to enhance the safe operation of the spectrophotometer.

Available Options

Product Number	Description
Y80-73065	Service Kit

MISCELLANEOUS EQUIPMENT

Gas Detectors

Bench Models for Non-Flammable Gases

Description: These easy-to-operate, versatile leak detectors pinpoint leaks too small to bubble with soap solution. Any gas-filled laboratory apparatus that is subject to leaks can benefit from a leak-free system. Test for leaks at cylinder connections, regulator assemblies, fittings, injector ports, columns, or anywhere else you may suspect a gas leak.

Note: These leak detectors are not designed to be used to determine leaks of combustible gases.

Design Features

Easy Operation

little or no training required.

Versatile

high/low switch controls sensitivity for detection of very small leaks.

Rechargeable Battery

allows portable use for up to four hours.

Sensitivity

Argon	1×10^{-5} cc/sec .012 cu ft/yr *
Helium	1×10^{-4} cc/sec .011 cu ft/yr *
Carbon Dioxide	1.1×10^{-4} cc/sec .123 cu ft/yr *
Refrigerant	1.1×10^{-4} cc/sec .123 cu ft/yr *
40% Hydrogen, 40% Helium (fuel mixture)	1×10^{-5} cc/sec .012 cu ft/yr *

* Minimum leak rate to produce 10% deflection of full scale.

Specifications

Detector	Thermistor-Actuated Thermal Conductivity Cell
Readout	Center Zero meter, Graduated -50 to 0 to +50
Circuitry	Solid State
Pump	Diaphragm-Type, 8V, 55Hz
Line Voltage	Internally Selectable 115/230V, 50/60 Hz
Battery	Rechargeable Ni-Cd, 8V

Ordering Information

Product Number	Description
Y80-21070	Miniature Model

Hydrogen Leak Detector

Description: Airgas's HY-ALERTA™ 500 Handheld Hydrogen Leak Detector is a portable hydrogen leak detector able to respond to the widest range of hydrogen gas concentrations without the need of any peripheral equipment. The sensor probe has a unique visual LED array that will effectively help navigate to the source of a hydrogen leak where hydrogen gas is produced, used, transported or stored. With two sensing elements on the same semiconductor die, the HY-ALERTA™ 500 can detect hydrogen leaks as low as 15 ppm and will not saturate or be destroyed when detecting high concentrations of hydrogen up to 100%. The flexible cable allows the sensor probe access to virtually all potential leak sources. It has an operating time of 10 hours and an operating temperature range of 0°C to 45°C.



MISCELLANEOUS EQUIPMENT

Design Features

- **Easy Operation:** There is no need for peripheral equipment; has a flexible cable; no training needed to use, 'Plug-and-play'
- **Versatile:** Can respond to a wide range of hydrogen gas concentrations from 15 ppm to 100% hydrogen by volume; operating temperature range of 0°C to 45°C, storage temperature range of -20°C to 45°C; calibration background gas is air
- **Rechargeable Battery:** Has an operating time of 10 hours; 4 hours maximum with included charger

Performance

Hydrogen Sensitivity Range	15 ppm to 100% hydrogen by volume No peripheral equipment needed
Initial Response Time	in seconds
Ingress Protection	IP64 capable
Field Verification/Calibration Period	1 year
Product Life Expectancy	10 years

Lithium Ion Battery Performance

Operating Time	10 hours
Charge Time	4 hours maximum with included charger

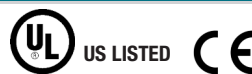
Operating Conditions

Operating Temperature Range	0°C to 45°C
Storage Temperature Range	-20°C to 45°C
Calibration Background Gas	Air

Dimensions

Unit Weight	2.15 lbs, 975 g
Total Length	6.8 in.
Total Width	3.4 in.
Depth	1.4 in.
Probe Length	7.8 in.
Probe Tip Diameter	0.5 in.
Probe Handle Diameter	1.2 in.
Coiled Cord Length Retracted	26in.
Coiled Cord Length Extended	72 in.
Coiled Cord Diameter	0.7 in

Certifications



Ordering Information

Part Number	Description
Y80-HHA500	Handheld hydrogen leak detector

Stainless Steel Sample Cylinder

Sample Cylinders

MISCELLANEOUS EQUIPMENT

Description: These stainless steel sample cylinders are corrosion-resistant and suitable for transporting most liquids and gases. The double outlet cylinders are fabricated from 18-8 Type 304 stainless steel and are available in 150 milliliters to 1,000 milliliters. All cylinders are equipped with 1/4" MNPT valves of 316 stainless steel with PTFE® packing and Monel stems.



Ordering Information

Product Number	Water Volume (ml) **	PTFE Lined	Cylinder Diameter		DOT		Specification
			In	(cm)	In	(cm)	
Y99-252101	150	N	8 1/4"	(21)	1 1/2"	(4)	3E1800
Y99-252105	300	N	9 1/4"	(23)	2"	(5)	3E1800
Y99-252105T*	500	Y	9 1/4"	(23)	2"	(5)	3E1800
Y99-252110	500	N	13 7/8"	(35)	2"	(5)	3E1800
Y99-252115	1,000	N	9 1/2"	(24)	4"	(10)	3A1800

* PTFE internal coating.

** Add 3" (7cm) for valve length

SFE/SFC Cylinder Connection Kit

Connections

MISCELLANEOUS EQUIPMENT

Description: The Airgas® SFE/SFC Cylinder Connection Kit contains a 320 CGA connector, manual relief valve and 10 feet of pre-cleaned stainless steel tubing. The connector assembly is constructed of Type 316L stainless steel with Type 304 stainless steel tubing and is specifically cleaned for supercritical applications. The manual relief valve contains a unique diffuser/restrictor element for controlled venting. This unit makes the connection between the cylinder and instrument a simple procedure requiring no adapters or additional hardware.



Specifications/Materials

Maximum Rated Inlet Pressure	3,000 psig
Body	316 Stainless Steel
Valve	316 Stainless Steel
Valve Packing	PTFE
Restrictor	316 Stainless Steel
Tubing	316 Stainless Steel

Ordering Information

Product Number	Description	Connections
Y99-TP18C320K	Cylinder Connection Kit w/ 1/8" Tubing	1/8" Compression Fitting
Y99-TP14C320K	Cylinder Connection Kit w/ 1/4" Tubing	1/4" Compression Fitting

Gas Cylinder Jackets

Cylinder Jackets

ACCESSORIES

Description: When mixing several hydrocarbon components in a cylinder and exposing the cylinder to low temperatures. Your hydrocarbon will become a sticky mess. The heavier molecules will stick to the cylinder walls, causing problems with the accuracy of the mixture.

To prevent this from happening, Airgas' cylinder jacket features a self-limiting heated cable that prevents overheating. This self-limiting cable heats up to 120F. It is designed to maintain the temperature of the hydrocarbon above its dew point, keeping it from stratifying.

Airgas' cylinder is constructed of materials approved by Underwriters Laboratories Inc. for Class 1 Division 2, Group B, C, and D hazardous locations.



NOTE: These jackets are not designed to heat up cylinders that have been in cold or freezing environments. Cold cylinders need to be brought up to temperature before one uses the Airgas cylinder blanket.

Excess heat lost can be experience through the top of the cylinder jacket. Airgas recommends the regulator hood to prevent this heat lost.

Other sizes are available, please call 800-939-5711.

Design Features

Prevents hydrocarbons mixtures from stratifying

heats and insulates to prevent the content form condensing

Silicone-impregnated fiberglass liner and polyester exterior

provides protects from the elements

Fluoropolymer overjeacket

protects the heat cable from corrosion

D-rings with Velcro line

protects the heat cable from corrosion

Applications

Natural gas, power plants and utilities

Specifications

Maintain Temperature	70F Ambient; 120F; 0F Ambient; 60F
Electrical Classifications	Class 1 Division 2 Groups B, C, and D
Power Requirements	120 Voltage (240 Voltage option)
Power Output	8 watts/ft at 50F
Flexible Conduit	10' of 3 color coded conductors

Ordering Information

Product Number	Material	Cylinder Size	Dimensions of Jacket	Electrical
Y99-FX200V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	200	12" x 51"	14' of internal wire
Y99-FX150V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	150A	11" x 47"	12' of internal wire
Y99-FX33AV120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	33A	11" x 15"	8' of internal wire
Y99-FX80A120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	80A	11" x 33"	10' of internal wire
Y99-FX300V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	300	12" x 55"	16' of internal wire
Y99-FX350V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	350	17" x 45"	19' of internal wire
Y99-FXLP5V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	LP5	14" x 18"	5' of internal wire

Ordering Information for Accessories

Product Number	Description
Y99-THERMOSTAT	Thermostat in a NEMA 7 Housing
Y99-CYLPAD	12" x 12" Insulation Pad
Y99-REGHOOD	Regulator hood

World Wide Cylinder Connections

Based on Gas

CYLINDER CONNECTION CHART

Gas		UHP DISS	CGA	BS	DIN	AFNOR	JIS
Air	Air		590	3	6		
Ammonia	NH3	720	660/705/240	10	6	C	22-R
Argon	Ar	718	580	3	6	C	22/23-R
Arsenic Pentafluoride	As2F5	642			8		
Arsine	AsH3	632	350	4	1	E	22-L
Boron Trichloride	BCl3	634	660	14	8	J	22-L
Boron Trifluoride	BF3	642	330	14	8	J	22-L
Bromochlorodifluoromethane	BrCClF2		660	6	6	C	
Bromotrifluoromethane	BrCF3		660	6	6	C	
Butane	C4H10		510	9	1	E	23-L
Carbon Dioxide	CO2	716	320	8	6	C	
Carbon Monoxide	CO	724	350	4	6	E	22-L
Carbonyl Sulfide	COS		330			E	
Chlorine	Cl	728	660	6,14	8	J	26-R
Chlorine Trifluoride	ClF3		670	6		P	26-L
Chlorodifluoromethane	CHClF2		660	6	6	C	
Chlorotrifluoromethane	CClF3		660		6	C	
Diborane	B2H6	632	350	4			22-L
Dichlorodifluoromethane	CCl2F2	716	660	6	6	C	
Dichlorofluoromethane	CCl2FH		660	6	6	C	
Dichlorosilane	H2SiCl2	636	678	16	6		
Dichlorotetrafluoroethane	C2Cl2F4		660	6	6	C	
Diethylzinc	(C2H5)2Zn	726	510				
1,1-Difluoroethylene	C2F2H2		350		1	E	22-L
Dimethylzinc	(CH3)2Zn	726					
Dimethylamine	C2H7N		705	11	1	E	22/26-L
Dimethylether	C2H6O		510		1	E	26-L
Disilane	Si2H8	632				E	
Ethane	C2H6		350		1	E	22-L
Ethyl Chloride	C2ClH5		300	7,17	1	E	26-L
Ethylene	C2H4		350	2	1	E	22-L
Fluorine	F2		679/670		8	F	22-R
Germane	GeH4	632	350			E	
Halocarbon-14	CF4		580	6	6	C	
Helium	He	718	580	3	6	C	22/23-R
Hydrogen	H2	724	350	4	1	E	22-L
Hydrogen Bromide	HBr	634	330		8	K	26-R
Hydrogen Chloride	HCl	634	330		8	K	26-R
Hydrogen Fluoride	MF	638	670/660	6		K	26-R
Hydrogen Iodide	HI		330			K	
Hydrogen Selenide	H2Se	632	350	4	6	E	
Hydrogen Sulfide	H2S	722	330	16	6	E	
Isobutane	C4H10		510	2	1,2,4	E	
Isobutylene	C4H8		510	2	1	E	23-L
Krypton	Kr	718	580	3	6	C	22/23-R
Neon	Ne	718	580	3	6	C	22/23-R

CYLINDER CONNECTION CHART

Based on Gas

World Wide Cylinder Connections

Gas		UHP DISS	CGA	BS	DIN	AFNOR	JIS
Nitrogen	N2	718	580, 677, 680	3	10	C	22/23-R
Nitrous Oxide	N2O	712	326	13	11	G	
Oxygen	O2	714	540	3	9	F	22/23-R
Perfluoropropane	C3F8	716	660				
Phosgene	CCl2O		660	6,14	8	K	26-R
Phosphine	PH3	632	350	4	1	E	
Phosphorus Pentafluoride	PF5	642	330				
Silane	SiH4	632	350	3	1	E	
Silicon Tetrachloride	SiCl4	636		Compression Fittings			
Silicon Tetrafluoride	SiF4	642					
Sulfur Dioxide	SO2		660	7	10,16	K	26-R
Sulfur Hexafluoride	SF6	716	590	6	6	C	
Trichlorosilane	HSiCl3	636					
1,1,1-Trichlorotrifluoroethane	C2Cl3F3	716	660				
Trichlorofluoromethane	CCl3F		660				
Trifluoromethane	CF3H		660				
Trimethylamine	C3H9N		705	11	1	E	26-L
Tungsten Hexafluoride	WF6	638	670		8	J	
Vinyl Bromide	C2H3Br		510		1	E	26-L
Vinyl Chloride	C2ClH3		510	7	1	E	26-L
Vinyl Fluoride	C2FH3		350		1	E	22-L
Xenon	Xe	718	580	3	6	C	22/26-L

(1) This list is for your reference only. The cylinder connections are for pure gases only, mixtures will change the cylinder connection. Check with the gas supplier for the proper cylinder connection for gas mixtures.

Source of Information:
CGA V 1 2005
BS 341 Part 1 1991
DIN 477 Teil 1
AFNOR NF E 29 -650
JIS (Jap.) B 8246 2004

Cylinder Valve Fitting Specifications

Brass, Brass Chrome, Stainless Steel, Monel®

All cylinder valve outlets and connections are designed and constructed to conform to the specifications established by the Compressed Gas Association (CGA).

The CGA connection standard numbers are followed by a multipart, sequentially listed descriptive code. This code generally includes:

- outside diameter of valve threads
- threads per inch and thread size
- left-hand or right-hand thread
- external or internal threads

CGA valve connections for converting cylinder valve outlets to MNPT 1/4" (CGA 110, 160, 170, and 180 are 1/8" MNPT) are available in brass, stainless steel, and Monel.



Fitting Specifications

MISCELLANEOUS EQUIPMENT

Ordering Information		
Product		Product Number
Brass CGA Nipples		
Chrome Plated Brass Nipple with Check Valve		Y99-(CGA)C13CV
Hand Tight Nipple		Y99-(CGA)HTGC
Brass CGA Nut		
Chrome Plated Brass Nut		Y99-(CGA)C14
Hand Tight Nut		Y99-(CGA)HTNC
Brass CGA Kits includes Nipple, Nut and Washer if applicable		
Chrome Plated Brass CGA Kit		Y99-(CGA)C13K
Chrome Plated Brass W/Check Valve CGA Kit		Y99-(CGA)C13CVK
Stainless Steel CGA Nipples		
Stainless Steel Nipple		Y99-(CGA)C43
Stainless Steel Nipple with Check Valve		Y99-(CGA)C43CV
Stainless Steel CGA Kits includes Nipple, Nut and Washer if applicable		
Stainless Steel CGA Kit		Y99-(CGA)C43K
Stainless Steel W/Check Valve CGA Kit		Y99-(CGA)C43CVK
Stainless Steel CGA Nuts		
Stainless Steel Nut		Y99-(CGA)C44
Monel CGA Nipples		
Monel Nipple		Y99-(CGA)C33
Monel Nipple with Check Valve		Y99-(CGA)C33CV
Monel CGA Nuts		
Monel Nut		Y99-(CGA)C34
Monel CGA Kits includes Nipple, Nut and Washer if applicable		
Monel CGA Kit		Y99-(CGA)C33K
DISS Connections		
DISS connections		Y99-DISS(###)VCR

MISCELLANEOUS EQUIPMENT

Fitting Specifications

Cylinder Valve Fitting Specifications

Cont.

Ordering Information

Product	Product Number
CGA and DISS Washers	
DISS Nickel Washer	Y99-DISSW4
PTFE Washer	Y99-(CGA)W5, Y99-705W for CGA 705
Fiber Washer	Y99-(CGA)W6
Lead Washer	Y99-(CGA)W7
Copper Washer	Y99-(CGA)W8
PCTFE Washer	Y99-(CGA)W9
Yoke Washer	Y99-YOKEWASHER
DISS Aluminum Washer	Y99-DISSWA
Hand Tight Washer	Y99-(CGA)HTOR

CGA - Yoke Fittings

Brass/Nickel Plated

Ordering Information

CGA	Common Service	Yoke
870	Medical Oxygen 3,000 psig	Y99-870C15
890	Medical Oxygen Mixes 3,000 psig	Y99-890C15
930	Medical Helium 3,000 psig	Y99-930C15
940	Medical Carbon Dioxide 3,000 psig	Y99-940C15
960	Medical Nitrogen 3,000 psig	Y99-960C15
973	Medical Mixes 3,000 psig	Y99-973C15

CGA - DISS Fittings

Stainless Steel

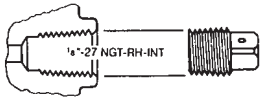
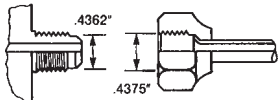
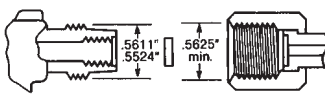
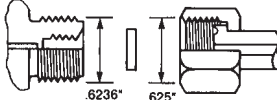
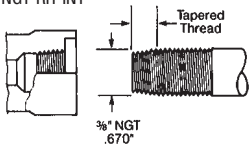
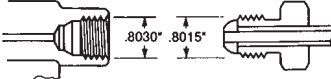
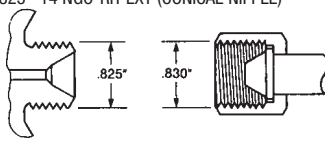
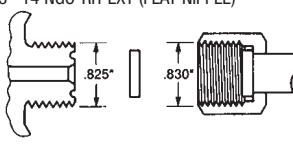
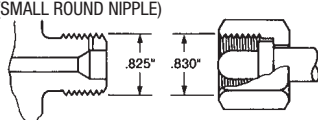
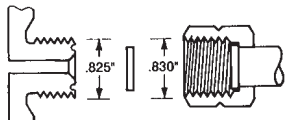
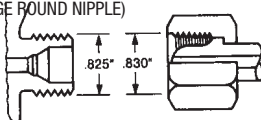
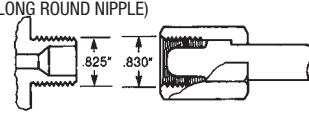
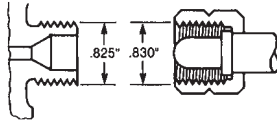
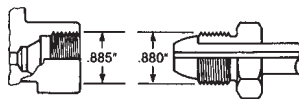
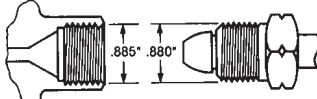
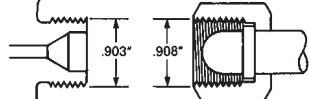
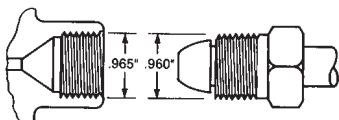
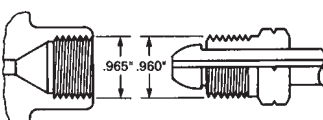
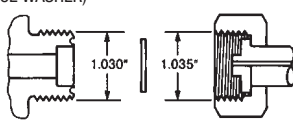
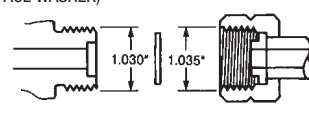
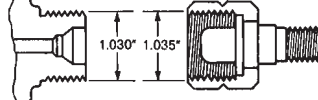
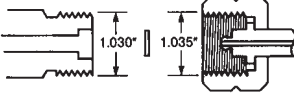
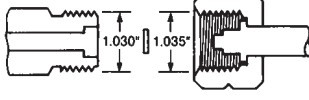
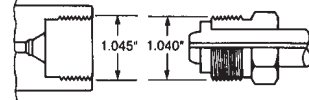
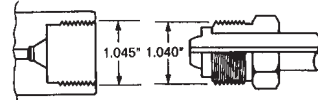
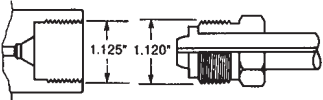
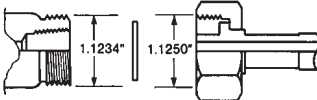
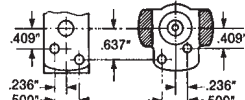
Ordering Information

CGA	Common Service	Nut, Nipple & Washer Set	Washer
632	Silane 3,000 psig	Y99-DISS632	Y99-DISSW4
634	Chlorine 3,000 psig	Y99-DISS634	Y99-DISSW4
636	Hydrogen Chloride 3,000 psig	Y99-DISS636	Y99-DISSW4
640	NF ₃ 3,000 psig	Y99-DISS640	Y99-DISSW4
712	Nitrous Oxide 3,000 psig	Y99-DISS712	Y99-DISSW4
714	Oxygen 3,000 psig	Y99-DISS714	Y99-DISSW4
716	SF ₆ 3,000 psig	Y99-DISS716	Y99-DISSW4
718	Inert 3,000 psig	Y99-DISS718	Y99-DISSW4
720	Ammonia 3,000 psig	Y99-DISS720	Y99-DISSW4
724	Flammables 3,000 psig	Y99-DISS724	Y99-DISSW4
728	Chlorine 3,000 psig	Y99-DISS728	Y99-DISSW4

Cylinder Valve Fitting Specifications Cont.

Fitting Specifications

MISCELLANEOUS EQUIPMENT

CGA 160 1/8"-27 NGT-RH-INT 	CGA 165 .4375"-20 UNF-2A-EXT (1/4" SAE FLARE) 	CGA 170 .5625"-18 UNF-2A-RH-EXT 	CGA 180 .625"-18 UNF-2A-RH-EXT 
CGA 240 3/8"-18 NGT-RH-INT 	CGA 296 .803"-14 UNS-2B-RH-INT (BULLET NIPPLE) 	CGA 300 .825"-14 NGO-RH-EXT (CONICAL NIPPLE) 	CGA 320 .825"-14 NGO-RH-EXT (FLAT NIPPLE) 
CGA 326 .825"-14 NGO-RH-EXT (SMALL ROUND NIPPLE) 	CGA 330 .825"-14 NGO-LH-EXT (FLAT NIPPLE) 	CGA 346 .825"-14 NGO-RH-EXT (LARGE ROUND NIPPLE) 	CGA 347 .825"-14 NGO-RH-EXT (LONG ROUND NIPPLE) 
CGA 350 .825"-14 NGO-LH-EXT (ROUND NIPPLE) 	CGA 500 .885"-14 NGO-RH-INT (BULLET NIPPLE) 	CGA 510 .885"-14 NGO-LH-INT 	CGA 540 .903"-14 NGO-RH-EXT 
CGA 580 .965"-14 NGO-RH-INT 	CGA 590 .965"-14 NGO-LH-INT 	CGA 660 1.030"-14 NGO-RH-EXT (FACE WASHER) 	CGA 670 1.030"-14 NGO-LH-EXT (FACE WASHER) 
CGA 677 1.030"-14 NGO-LH-EXT (ROUND NIPPLE) 	CGA 678 1.030"-14 NGO-LH-EXT (RECESSED WASHER) 	CGA 679 1.030"-14 NGO-LH-EXT (TIPPED NIPPLE) 	CGA 680 1.045"-14 NGO-RH-INT 
CGA 695 1.045"-14 NGO-LH-INT 	CGA 703 1.125"-14 NGO-LH-INT 	CGA 705 1.125"-14 UNS-2A-RH-EXT (FACE WASHER) 	CGA 973 PIN-INDEXED YOKE, PINS 11-24 

Miscellaneous Equipment – Tubing and Fittings

Engineering the Right Solutions



TUBING AND FITTINGS

CGA Cylinders Connections



Design Features

Premium Grade Stainless Steel

Grade 304 tubing, specially cleaned to ensure inertness. This is what is used in stainless steel columns from this tubing.

Cleaned Copper

Solvent-washed to special standards (ASTM B-20 plus special cleaning), to remove residual hydrocarbons. Recommended for most GC plumbing applications.

Clean Tubing and Pipe Fittings

Chromatographically Cleaned Tubing

Description: Chromatographically cleaned tubing is made of premium grade stainless steel tubing or plumbing quality specially cleaned copper tubing.

Tube fittings are all two-piece ferrule construction. They may be either Compression or Parker Alok®. We offer fittings in both brass and 316 Stainless Steel. Pipe fittings are also offered in both brass and stainless steel.

TOD = Tube Outside Diameter

FNPT = Female National Pipe

Thread MNPT = Male National Pipe

Thread RED = Reducing

Ordering Information

Product Number	Material	Description (OD x ID)	Length
Premium Grade Stainless Steel (304)			
Y40-20526U	Stainless Steel	1/8" x 0.085" (3.18 x 2.1mm)	50' Coil
Y40-20527	Stainless Steel	1/4" x 0.209" (6.35 x 5.3mm)	50' Coil
Y40-20552	Stainless Steel	1/16" x 0.010" (1.59 x 0.254mm)	100' Coil
Y40-20553	Stainless Steel	1/16" x 0.030" (1.59 x 0.762mm)	100' Coil
Cleaned Copper (GC Plumbing Quality; ASTM B-280 plus Special Cleaning)			
Y40-20488	Cleaned Copper	1/8" x 0.065" (3.18 x 1.65mm)	50' Coil
Y40-20489	Cleaned Copper	1/4" x 0.190" (6.35 x 4.83mm)	50' Coil
General Purpose Copper (ASTM B-280)			
Y40-20520U	Copper	1/8" x 0.065" (1.59 x 0.762mm)	50' Coil
Y40-20522	Copper	1/4" x 0.190" (6.35 x 4.83mm)	50' Coil

*American Society for Testing and Materials

Ordering Information

Product Number	Material	Description (OD x ID)
Tube Tee		
Y99-413923	316 Stn Steel	1/16" TOD Compression Tee
Y99-413924	316 Stn Steel	1/8" TOD Compression Tee
Y99-B2003	Brass	1/8" TOD Compression Tee
Y99-413454	316 Stn Steel	1/4" TOD Compression Tee
Y99-480019	316 Stn Steel	1/4" TOD x 1/4" MNPT x 1/4" TOD

Clean Tubing and Pipe Fittings Cont.

Chromatographically Cleaned Tubing

CGA Cylinders Connections

TUBING AND FITTINGS

Ordering Information		
Product Number	Material	Description (OD x ID)
Pipe Tee		
Y99-032	316 Stn Steel	¼" MNPT x ¼" FNPT x ¼" FNPT
Y99-012C	Chrome-Plated Brass	¼" MNPT x ¼" FNPT x ¼" FNPT
Y99-480080	316 Stn Steel	1/8" FNPT tee
Y99-26417	316 Stn Steel	¼" FNPT tee
Y99-413927	Brass	¼" FNPT tee
Y99-26217	Chrome-Plated Brass	¼" FNPT tee
Pipe to Tube Adapter		
Y99-413928	316 Stn Steel	1/16" TOD x ¼" MNPT
Y99-26162	Brass	1/8" TOD x ¼" MNPT
Y99-26462	316 Stn Steel	1/8" TOD x ¼" MNPT
Y99-26460	316 Stn Steel	¼" TOD x ¼" MNPT
Y99-26160	Brass	¼" TOD x ¼" MNPT
Y99-26464	316 Stn Steel	½" TOD x ¼" MNPT
Y99-413930	316 Stn Steel	1/16" TOD x ¼" FNPT
Y99-26140	Brass	1/8" TOD x ¼" FNPT
Y99-26422	316 Stn Steel	1/8" TOD x ¼" FNPT
Y99-26421	316 Stn Steel	¼" TOD x ¼" FNPT
Elbows		
Y99-413957	316 Stn Steel	1/8" TOD x 1/8" TOD
Y99-413915	316 Stn Steel	1/8" TOD x ¼" MNPT
Y99-413917	316 Stn Steel	1/8" TOD x ¼" FNPT
Y99-413448	316 Stn Steel	¼" TOD x 1/8" MNPT
Y99-413914	316 Stn Steel	¼" TOD x ¼" MNPT
Y99-480028	Brass	¼" TOD x ¼" MNPT
Y99-413916	316 Stn Steel	¼" TOD x ¼" FNPT
Y99-480027	Brass	¼" TOD x ¼" FNPT
Y99-4801153	316 Stn Steel	3/8" TOD x ¼" MNPT
Y99-4801133	Brass	½" TOD x ¼" MNPT
Y99-480095	316 Stn Steel	1/8" MNPT x ¼" FNPT
Y99-480094	Brass	1/8" MNPT x ¼" FNPT
Y69-411006	316 Stn Steel	¼" MNPT x ¼" FNPT
Y99-424792	316 Stn Steel	¼" MNPT x ¼" FNPT
Y99-424793	Brass	¼" MNPT x ¼" FNPT
Y99-26221	Chrome-Plated Brass	¼" MNPT x ¼" FNPT
Y99-480070	316 Stn Steel	¼" MNPT x ¼" F90° Swivel Flair
Y99-26414	316 Stn Steel	¼" FNPT x ¼" FNPT
Y99-BELBOW	Brass	¼" FNPT x ¼" FNPT
Y99-26214	Chrome-Plated Brass	¼" FNPT x ¼" FNPT

TUBING AND FITTINGS

CGA Cylinders Connections

Clean Tubing and Pipe Fittings Cont. Chromatographically Cleaned Tubing

Ordering Information		
Product Number	Description Material	(OD x ID)
Cross		
Y99-413946	316 Stn Steel	All Ports 1/4" TOD
Y99-480058	316-Plated Brass	M x F x F x F
Y99-26416	Stn Steel	1/4" FNPT
Y99-26216	Chrome-Plated Brass	1/4" FNPT
Reducing Adapter		
Y99-26112	Brass	1/8" FNPT x 1/4" MNPT
Y99-413933	Brass	1/4" FNPT x 1/4" MNPT
Y99-413935	Brass	1/2" FNPT x 1/4" MNPT
Y99-413964	316 Stn Steel	1/8" TOD x 1/4" Tube Stub
Y99-480078	Brass	1/4" TOD x 1/8" Tube Stub
Y99-480037	316 Stn Steel	1/2" TOD x 1/4" Tube Stub
Y99-413931	316 Stn Steel	1/8" MNPT x 1/4" FNPT
Y99-413922	316 Stn Steel	1/4" MNPT x 1/8" FNPT
Y99-413934	316 Stn Steel	1/4" MNPT x 1/2" FNPT
Unions		
Y99-413937	316 Stn Steel	RED 1/8" TOD x 1/4" TOD
Y99-480045	316 Stn Steel	RED 1/4" TOD x 6mm
Y99-480039	Brass	RED 1/4" TOD x 1/8" TOD
Y99-413940	316 Stn Steel	1/16" TOD 1/16" TOD
Y99-413938	316 Stn Steel	1/8" TOD x 1/8" TOD
Y99-413937	316 Stn Steel	1/8" TOD x 1/4" TOD
Y99-413936	316 Stn Steel	1/4" TOD x 1/4" TOD
Y99-413941	Brass	1/4" TOD x 1/4" TOD
Y99-480048	316 Stn Steel	1/2" FNPT with O-ring
Nipples		
Y79-411067	Brass	1/4" MNPT Hex x 1.45" long
Y99-4HLN2	Brass	1/4" MNPT Hex x 2" long
Y99-4801220	Brass	1/4" Hex x 3" long
Y99-480077	Brass	1/4" Hex x 4" long
Y99-423879	Brass	1/4" MNPT Hex RED x 1/8" MNPT
Y99-8HN	Brass	1/2" MNPT Hex x 2" long
Y99-26213	Chrome-Plated Brass	1/4" MNPT Hex x 1 1/4" long
Y99-4HLNOP	Chrome-Plated Brass	1/4" MNPT Hex x 3 1/2" long
Y99-26413	316 Stn Steel	1/4" MNPT Hex x 1 1/4" long
Y99-4HLN2SS	316 Stn Steel	1/4" MNPT Hex x 2" long
Y99-4HLN4SS	316 Stn Steel	1/4" MNPT Hex x 4" long

Supelcoat™ Fittings, Valves and Flexible Hoses

Airgas' advanced offering of specialty coated fittings, valves and high pressure flexible hoses are designed to prevent interaction of low concentration corrosive and volatile compounds in the calibration gas mixtures used in critical environmental testing, plus in other applications where all the sample delivery components should be totally inert.

These fittings, hoses, and valves are coated with the proprietary Supelco Supelcoat™ coating which prevents any interaction of the reactive trace gas species with the “wetted” internal surfaces. The coating prevents any adsorption or “drop out” of low concentration components such as: reduced sulfur compounds; ammonia; NO₂; HCl; or mercury. Additionally, this coating is recommended when using calibration standards for the proposed new EPA regulation including testing for formaldehyde, HF and HBr.

When these fittings with this unique coating technology is combined with our Cyclone Technology regulators with Supelcoat, the result is the optimum components for gas delivery systems for EPA Protocol gases, ug/M³ level mercury standards, HCl mixtures for MATS compliance, and in numerous other analytical applications involving volatile and corrosive components.

Inert Coated Fittings

SUPELCOAT



Design Features

- Enhances analytical applications as high accuracy, trace level, calibration gas components will not react with the regulators, valves, piping or fittings comprising the sample handling system.
- Ensures compounds within the gas are delivered without reacting with reactive metal surfaces
- Increases speed of instrument response and consistency of run-to-run data.
- High pressure flexible hoses are of an internal corrugated bellows construction and welded for leak tight operation in all gases
- Shipped bagged and ready for use

Ordering Information

Nominal	Max	Nominal	Max
Y15-4PFLEX30FMSC	Flexible hose with armor casing 30" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y15-4PFLEX48FMSC	Flexible hose with armor casing 48" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y15-4PFLEX72FMSC	Flexible hose with armor casing 72" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y36-4DMFLSC	Multiturn packless diaphragm valve 1/4" mnpt x 1/4" fnpt long leg Supelcoat	316 stainless steel	3500 psig
Y36-4DMMSC	Multiturn packless diaphragm valve 1/4" mnpt x 1/4" mnpt Supelcoat	316 stainless steel	3500 psig
Y37-4DMFLSC	Quarter turn packless diaphragm valve 1/4" mnpt x 1/4" fnpt long leg Supelcoat	316 stainless steel	3500 psig
Y99-330CKSC	CGA 330 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y99-660CKSC	CGA 660 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y99-580CKSC	CGA 580 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y40-20626USC	1/8" x 0.085" wall(3.18 x 2.1mm) 50 foot coil Supelcoat	304 stainless steel	3000 psig
Y40-20527USC	Tubing 1/4" x 0.209" wall(6.35 x 5.3mm) 50 foot coil Supelcoat	304 stainless steel	3000 psig
Y99-26462SC	Male connector 1/4" mnpt x 1/8" compression Supelcoat	316 stainless steel	3000 psig
Y99-26460SC	Male connector 1/4" mnpt x 1/4" compression Supelcoat	316 stainless steel	3000 psig
Y99-413915SC	Male Elbow 1/4" mnpt x 1/8" compression Supelcoat	316 stainless steel	3000 psig
Y99-413914SC	Male Elbow 1/4" mnpt x 1/4" compression Supelcoat	316 stainless steel	3000 psig
Y99-413924SC	Tee compression ferrule 1/8" tod compression Supelcoat	316 stainless steel	3000 psig
Y99-413924SC	Tee compression ferrule 1/4" tod compression Supelcoat	316 stainless steel	3000 psig

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The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

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PRESSURE REGULATORS

Disposable

Disposable Cylinder Regulators

Product								
Service	General Purpose	Non-Corrosive	General Purpose	Non-Corrosive/ Preset Flow	Non-Corrosive/ Preset Flow	Non-Corrosive/ Preset Flow	Non-Corrosive/ Preset Flow	High-Purity
Part Number	Y11 2300	Y11 2302	Y11 2303	Y11 2700A	Y11 2700AV	Y11 2701A	Y11 2701AV (AVB)	Y12 2800
	AB AN BB BN CB CN	A B C		5 9 10 15 25 50 60 90	5 9 10 15 25 50 60 90	5 9 10 15 25 50 60 90	5 9 10 15 25 50 60 90	160 165
Stage	1	1	1	1	1	1	1	2
Body	Brass	Brass	Brass	Brass Plated	Brass Plated	Brass Plated	Brass Plated	Brass Plated
Diaphragm/ Piston	Viton	Viton	Neoprene	Brass	Brass	Brass	Brass	Brass/SS
Seats	Neoprene	Neoprene	Neoprene	TFE	TFE	TFE	TFE	TFE/Viton
Connection	165	165	600	C-10	C-10	180,320,350,580, 590,1/4 FNPT	1/4 FNPT, C10/600	160,165
Pressure	300	400	300	1000	1000	3000	3000	300
Gauge	400	400	N	1200	1200	400	400	300
Valve	N Y N Y N Y	N	N	N	Y	N	Y	N
Connection	1/4 Barb 1/8 FPT	1/4 Barb 1/8 FPT	1/4 Barb 1/8 FPT	1/4 Barb	1/8 Barb	3/16 Barb	3/16 Barb	1/8 MNPT
Pressure	10 25 50	5 7.5 15	25	60	60	60	60	10 60
Gauge	N	N	N	N	N	N	N	Y
Orifice			0.005					
CV	0.03	0.03		0.02	0.02	0.02	0.02	0.02
Flow Rate, LPM	4.13 6.95 11.3	5.5 8 7.5	N/A	0.3 0.5 0.9 1 1.5 2.5 5 6 9	0.3 0.5 0.9 1 1.5 2.5 5 6 9	0.3 0.5 0.9 1 1.5 2.5 5 6 9	0.3 0.5 0.9 1 1.5 2.5 5 6 9	7.2

Product								
Service	Corrosive/ Preset Flow	Corrosive/ Preset Flow	Mildly Corrosive/ Selectable Flow	General Purpose	General Purpose	Non-Corrosive	Mildly Corrosive	Mildly Corrosive
Part Number	Y11 4704	Y11 4704V	Y11 530A	Y11 5301	Y11 5301G	Y11 5302	Y11 5500	Y11 5501
	5 7 10 15 25 50 70	5 7 10 15 25 50 70	180 580 590 660 C10	3 5 10	3 5 10	A B C	A AV B BV	A AV AS AVS B BV BS BSV D DV DS DSV
Stage	1	1	1	1	1	1	1	1
Body	SS	SS	Aluminum	Aluminum, Gold Anodized	Aluminum, Gold Anodized	Aluminum	Aluminum	Aluminum
Diaphragm/ Piston	SS	SS	Aluminum	Neoprene	Neoprene	Viton	SS	SS
Seats	TFE	TFE	Nylon	Neoprene	Neoprene	Neoprene	TFE	TFE
Connection	C-10	C-10	180,580,590,660, C-10, 1/8 FNPT	600	600	165	160,165,170,180, 1/8 FNPT	320,350,580,590,660,1/8 FNPT
Pressure	1200	1200	3000	300	300	400	500	3500
Gauge	1200	1200	3000	N	300	400	600	N 3500 N 3500 N 3500
Valve	N	Y	N	Y	Y	N	N Y N Y	N Y N Y N Y N Y N Y
Connection	3/16 Barb	3/16 Barb	1/4 Barb	1/4 Barb	1/4 Barb	1/4 Barb	1/8 FPT	1/8 FPT
Pressure	60	60	50	50	50	5 7.5 15	25 60	25 60 100
Gauge	N	N	N	N	N	N	N	60 N 100 N 200 N
Orifice				0.008	0.008			
CV	0.02	0.02				0.03	0.08	0.08
Flow Rate, LPM	0.3 0.5 0.7 1 1.5 2.5 5 7	0.3 0.5 0.7 1 1.5 2.5 5 7	0.3-8.0 Selectable	0.3 0.5 1	0.3 0.5 1	5.5 8 7.5	N/A	N/A

Emissions Monitoring Applications

Ultra- High Purity Stainless Steel Regulators

Specialty Gases and Equipment Product Reference Guide

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Ultra-High Purity Stainless Steel Regulators

Emissions Monitoring Applications –

PRESSURE REGULATORS

Ultra High-Purity



Design Features

Packless diaphragm valve built into the body

Unique internal design sweeps diaphragm cavity

Check valve CGA

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)
for easy panel mounting.

Diaphragm Packless Valve (with 1/8" Compression fitting)
promotes system purity.

Threadless Seat Design
provides longer regulator life.

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat)

Description: This series of stainless steel single-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process faster and without contamination. This is an excellent regulator for EPA protocol gas mixtures, as well as other mixes used in high purity applications.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Materials	
Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	Inconel

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.23/100 psi

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat) Cont.

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-CHP444A(CGA)	316 SS	4,000	30	190	0 - 4,000	30Hg - 0 - 30
Y11-CHP444B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y11-CHP444D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y11-CHP444F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400
Y11-CHP444G(CGA)	316 SS	4,000	500	985	0 - 4,000	0 - 1,000

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat)

Description: This series of stainless steel two-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process more quickly and without contamination. This makes it an excellent regulator for EPA protocol gas mixtures, as well as other high purity applications.

The two-stage design provides a constant delivery pressure and the supply inlet effect that causes the outlet pressure to change as the inlet pressure drops is less than .01/100 psi of inlet pressure change.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-6} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Ultra High-Purity

PRESSURE REGULATORS



Design Features

Packless diaphragm valve built into the body

Unique internal design sweeps diaphragm cavity

Check valve CGA

Convuluted Hastelloy® C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/8" Compression fitting)

promotes system purity.

Threadless Seat Design

provides longer regulator life.

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat) Cont.

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-CHP445A(CGA)	316 SS	4,000	30	190	0 - 4,000	30 Hg - 0 - 30
Y12-CHP445B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y12-CHP445D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y12-CHP445F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Emissions Monitoring Applications

High Purity Stainless Steel Regulators

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PRESSURE REGULATORS

High-Purity



Design Features

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Threadless Seat Design

provides longer regulator life.

Materials

Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	Inconel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-C444AA (CGA)	316 SS	4,000	10	740	0-4,000	30" Hg-0-30
Y11-C444A (CGA)	316 SS	4,000	30	900	0-4,000	30" Hg-0-30
Y11-C444B (CGA)	316 SS	4,000	60	1,250	0-4,000	0-100
Y11-C444D (CGA)	316 SS	4,000	100	1,750	0-4,000	0-200
Y11-C444F (CGA)	316 SS	4,000	250	2,700	0-4,000	0-400
Y11-C444G (CGA)	316 SS	4,000	500	3,700	0-4,000	0-1000

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder
Y15-QMS2	Quick Mounting Option for 2 Cylinders

Stainless Steel Single-Stage Models (Threadless Seat)

Description: These stainless steel single-stage high-purity regulators are recommended for non-corrosive analytical, mildly corrosive and process applications where precise flow control is not critical. A specially designed, convoluted Hastelloy C-22 diaphragm provides good regulating performance and maximum purity integrity without the need for a soft seal, which often can be a source of contamination.

Each regulator is capable of withstanding an internal vacuum and is provided with a diffusion-resistant, diaphragm packless outlet valve to maintain system purity. The optional bonnet vent adaptor enables venting hazardous gases in the event of diaphragm failure.

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-10, 0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs
Ports (6)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.23/100 psi

Stainless Steel Two-Stage Models (Threadless Seat)

Description: This series of stainless steel two-stage high-purity regulators is designed for non-corrosive analytical, mildly corrosive and process applications requiring precise, stable delivery pressure control. The two-stage design yields a delivery pressure change of less than 0.01/100 psi inlet change.

Convolute Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

A diaphragm packless outlet valve with a 1/4" compression-tube fitting is provided for flow control and to maintain system purity. Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

High-Purity

PRESSURE REGULATORS



Design Features

Convolute Hastelloy® C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)

for easy panel mounting.

Diaphragm Packless Valve (with 1/4" Compression fitting)

promotes system purity.

Threadless Seat Design

provides longer regulator life.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-10, 0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs
Ports (6)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-C445AA (CGA)	316 SS	4,000	10	165	0-4,000	30" Hg-0-30
Y12-C445A (CGA)	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y12-C445B (CGA)	316 SS	4,000	60	270	0-4,000	0-100
Y12-C445D (CGA)	316 SS	4,000	100	380	0-4,000	0-200
Y12-C445F (CGA)	316 SS	4,000	250	525	0-4,000	0-400

Available Options

Product Number	Description
Y99-CHROMNUT	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder
Y15-QMS2	Quick Mounting Option for 2 Cylinders

PRESSURE REGULATORS

High-Purity



Stainless Steel Positive-Seal Models

These single- and two-stage positive-seal regulators feature convoluted, Hastelloy C-22 diaphragms that provide maximum sensitivity, minimum droop and a leak-tight bonnet seal. Type 316 stainless steel internal components are ultra-sonically cleaned and electropolished to a 32-Ra surface finish for applications where a contamination-free flow stream is critical. Optional 15 Ra electropolished with facesal.

A rugged, mechanical linkage connecting the diaphragm and valve stem significantly reduces the possibility of pressure creep. A PCTFE seat provides positive closure and is compatible with a wide range of mildly corrosive or corrosive gases.

Each single-stage positive-seal regulator is designed with two 10 x 32 UNF-threaded body holes for bracket or panel mounting.

Specifications

Maximum Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-150 psig
Flow Capacity	Cv=0.04
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	2 x 10 ⁻⁸ ccs (helium)
Weight	4 lbs
Ports (4)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" Compression
Decay Inlet Characteristic	1.17/100 psi

Materials

Body	316 Stainless Steel
Friction Sleeve	PTFE
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel Continuous Wire
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel

Design Features

Tied, Convoluted Diaphragm Design

provides positive shutoff and minimizes creep.

Ultrasonic Cleansing and Electropolishing to a 32-Ra Surface Finish

allows high-purity integrity and contamination-free flow stream. (15 Ra electropolished surface is optional with facesal connections - not available with NPT or compression)

Large, Hastelloy C22 Convoluted Diaphragm

provides maximum sensitivity, minimum droop, and a leak-tight bonnet seal without the use of a contaminating soft seal.

PCTFE Seat

permits positive seat closure and provides wide media compatibility range.

Diaphragm Packless Valve (with standard 1/4" Compression fitting)

permits positive shutoff and flow control.

Optional Porting (consult Airgas)

for special port configurations: butt-welded, zero-clearance fittings (VCR®, Vaculok®, UltraSeal®, etc.) or space saving, internally machined, high-purity porting compatible with fitting styles mentioned above.

Single-Stage Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-E444A(CGA)	316 SS	3,500	0-30	875	0-4,000	30"-0-30
Y11-E444B(CGA)	316 SS	3,500	0-60	1,860	0-4,000	0-100
Y11-E444C(CGA)	316 SS	3,500	0-100	2,880	0-4,000	0-200
Y11-E444D(CGA)	316 SS	3,500	0-150	3,000	0-4,000	0-200
*Y11-E464A(CGA)	316 SS	3,500	0-30	875	0-4,000	30"-0-30
*Y11-E464B(CGA)	316 SS	3,500	0-60	1,860	0-4,000	0-60
*Y11-E464C(CGA)	316 SS	3,500	0-100	2,880	0-4,000	0-200
*Y11-E464E(CGA)	316 SS	3,500	0-150	3,000	0-4,000	0-200

* This unit incorporates a Hastelloy® C-22 stem and seat retainer and an Inconel® spring and Hastelloy C-22 diaphragm.

PRESSURE REGULATORS

High-Purity

Stainless Steel Positive-Seal Models
Cont.

Two-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-E444A(CGA)	316 SS	3,500	0-30	200	0-4,000	30"-0-30
Y12-E444B(CGA)	316 SS	3,500	0-60	250	0-4,000	0-100
Y12-E444D(CGA)	316 SS	3,500	0-100	300	0-4,000	0-200

Available Options		
Product Number	Description	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Emissions Monitoring Applications *Mercury Regulators*

Emissions Monitoring Applications – Mercury Regulators

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Internally Coated Stainless Steel Two-Stage Model

Description: This two-stage stainless steel, high-purity regulator has been designed to provide precise pressure regulation for the Airgas EPA Protocol Mercury Standards. The two-stage body, diaphragms, internal carriers, internal compression members, 0.06 Cv poppets, conical compression springs, 1/4" compression fitting and CGA 660 nipple are all passivated using a proprietary coating. This unique coating mitigates the chances of any level of mercury attaching to the internal wetted components of this specialty regulator. The result is a two-stage pressure regulator that will not hold back or alter any level (PPM or PPB) of the mercury standard.

The internal threadless seat design of the two-stage stainless steel regulator is the same as used in our high-purity Y12-C445 series. The convoluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. An outlet 1/4" compression fitting is provided to maintain optimum system purity.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	2-30 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150°F
Designed Leak Rate	2x10 ⁻⁸ ccs (helium)
Weight	4 lbs
Outlet	1/4" TOD Compression Fitting
Decay Inlet Characteristics	0.01/100 psi

Materials	
Body	316 Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve & Fitting	316 Stainless Steel
Trim	316 Stainless Steel

Single-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-HG445A660	316 SS	4,000	30	190	0 - 4000	30"Hg -0-30

Mercury Standards

PRESSURE REGULATORS



Design Features

- **Unique Proprietary Passivation Process**
special coating prevents mercury from "sticking" to the internal wetted components of the stainless steel regulator
- **Convoluted Hastelloy C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal
- **Threadless Seat Design**
provides longer regulator life

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Electrical Heated Regulator

Description: This Airgas regulator is designed to heat and vaporize media to keep condensable liquids in the gas phase. These regulators are commonly used in gas chromatography, hydrocarbon sampling, fluid fraction-alization, sampling conditioning and to preheat heavy process fluids.

This uniquely designed regulator allows the user to dis-assemble the regulator and heat transfer components for complete cleaning and repair of the unit, reducing expense cost and down time.

Specifications	
Max Rated Inlet Pressure	3,500 psig
Outlet Pressure Ranges	0-10, 1-30, 2-60, 3-100, 10-250, 20-500 psig
Operating Temperature	200 watts up to 500F
Ambient Temperature	-4F to 104F
Flow Coefficient	Cv= 0.06
Inlet Connection	½" NPT female
Outlet Connection	¼" NPT female
Internal Volume	4.6 cc
Power Requirements	120 Voltage (240 Voltage option)
Temperature Controller	220F to 380F
Approximate Shipping Weight	8 lbs

Materials	
Body	316L Stainless Steel
Compression Member	Inconel 625
Diaphragm	Hastelloy C22
Seat	Vespel
Filter	Stainless Steel
Heater Seal	PEEK
Other Metals Parts exposed to the Media	Hastelloy, Inconel and 316L Stainless Steel
Bonnet	303 Stainless Steel

Electrical Vaporizing Regulator

PRESSURE REGULATORS



Design Features

- Low Internal Volume – allows rapid purging and stabilization of gas flow
- Electrical Approval – CSA, CE-ATEX certified
- Electrical Specifications – UL and CSA listed Class 1 Groups A,B, C and D
- Convoluted Hastelloy C22 Diaphragm – eliminate outgassing associated with elastomeric diaphragm

Single-Stage Ordering Information

Product Number	Delivery Pressure Range (psig)
Y11-V83556A	0-10
Y11-V83556B	1-30
Y11-V83556C	2-60
Y11-V83556D	3-100
Y11-V83556E	10-250
Y11-V83556F	20-500

Four-Stage Analytical Regulators

Description: Regulation of gas from high to low pressure generally results in a temperature drop inside the regulator. The larger the pressure drop ($P_1 - P_2 = P_d$), the greater the cooling effect. This is commonly known as Joule-Thompson (J-T) cooling effect. The J-T effect may subject the gas mixture to temperatures below the dew point of one or more components, resulting in separation and altering the composition of the mixture.

A common solution to maintain gas temperature above the dew point when regulating condensable calibration mixtures is to use an electrically-heated regulator. These regulators will maintain the gas temperature above the mixture dew point, however, their use can pose other operational and intrinsic issues such as: 1) the need for an electric power source (not so portable); 2) an explosion-proof rating (high cost and not portable) for use with flammable mixtures; and 3) inherently large temperature swings caused by wide heating cycles (common with electrically-controlled heated regulators) resulting in inconsistent analytical results.

The Airgas Model 144 regulator reduces cylinder pressure in four stages. The design incorporates three piston-sensed stages and a final fourth adjustable pressure stage with an Elgiloy® metal diaphragm. This technology provides distribution of the J-T cooling effect between multiple stages. As a result, reduction in cooling maintains gas temperatures above the dew point in the pressure regulator while preserving the mixture composition and achieving stable analytical results.



Design Features

- Four stages** reduce J-T cooling effect and maintains mixture composition
- Check valve cylinder connection** prevents air and contaminants from entering the gas stream during cylinder change out
- Diaphragm seal outlet valve** provides for flow shut-off and maintains gas purity
- Compact and light weight design** provides for easy transport
- No electricity** required allows for portability and use with flammable gases
- Pressure gauges** monitor cylinder and delivery pressures

Specifications

Inlet Pressure	3000 psig (207 bar) maximum and rated
Outlet Pressure Ranges	0 – 30 psig (2.1 bar), 0 – 75 psig (5.2 bar)
Flow Capacity	CV = 0.014
Operating Temperature	-40°F to 140°F (-40°C to 60°C) ambient
Designed Leak Rate	Bubble-tight (helium)
Decay Inlet Characteristic	0.4/100 psi
Regulator Inlet Port	1/4" NPT Female
Inlet Connection	Specify CGA
Outlet (Regulator Body)	1/8" NPT Female
Outlet Connection	1/4" NPT Female on outlet valve
Ports (4)	1/8" NPT Female
Inlet Filter	40 micron
Gauge	1.5" (41 mm) face
Weight	2 lbs.

Materials

Body, Pistons, Gauges	316 Stainless Steel
Diaphragm (4th Stage)	Elgiloy®
Seats	PFA
Seals	PTFE and Viton®
Bonnet	Brass nickel-plated
Filter	316 Stainless Steel

Ordering Information

Product Number	Material	Inlet Pressure (maximum)		Outlet Pressure (maximum)		Inlet Gauge		Delivery Gauge	
		psig	bar	psig	bar	psig	bar	psig	bar
Y12-1144A(CGA)-AL	316 Stainless Steel	3000	207	30	2.1	0 – 3000	0 – 207	0 – 60	0 – 4.1
Y12-1144B(CGA)-AL	316 Stainless Steel	3000	207	75	5.2	0 – 3000	0 – 207	0 – 100	0 – 6.9

* Specify CGA. Insert appropriate Compressed Gas Association connection number to complete the product number.
Example: Y12-1144A350-AL. Order by complete product number.

Emissions Monitoring – Cylinder Warming Blanket

Engineering the Right Solutions



Gas Cylinder Jackets

Cylinder Jackets

ACCESSORIES

Description: When mixing several hydrocarbon components in a cylinder and exposing the cylinder to low temperatures. Your hydrocarbon will become a sticky mess. The heavier molecules will stick to the cylinder walls, causing problems with the accuracy of the mixture.

To prevent this from happening, Airgas' cylinder jacket features a self-limiting heated cable that prevents overheating. This self-limiting cable heats up to 120F. It is designed to maintain the temperature of the hydrocarbon above its dew point, keeping it from stratifying.

Airgas' cylinder is constructed of materials approved by Underwriters Laboratories Inc. for Class 1 Division 2, Group B, C, and D hazardous locations.



NOTE: These jackets are not designed to heat up cylinders that have been in cold or freezing environments. Cold cylinders need to be brought up to temperature before one uses the Airgas cylinder blanket.

Excess heat lost can be experience through the top of the cylinder jacket. Airgas recommends the regulator hood to prevent this heat lost.

Other sizes are available, please call 800-939-5711.

Design Features

Prevents hydrocarbons mixtures from stratifying

heats and insulates to prevent the content form condensing

Silicone-impregnated fiberglass liner and polyester exterior

provides protects from the elements

Fluoropolymer overjeacket

protects the heat cable from corrosion

D-rings with Velcro line

protects the heat cable from corrosion

Applications

Natural gas, power plants and utilities

Specifications

Maintain Temperature	70F Ambient; 120F; 0F Ambient; 60F
Electrical Classifications	Class 1 Division 2 Groups B, C, and D
Power Requirements	120 Voltage (240 Voltage option)
Power Output	8 watts/ft at 50F
Flexible Conduit	10' of 3 color coded conductors

Ordering Information

Product Number	Material	Cylinder Size	Dimensions of Jacket	Electrical
Y99-FX200V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	200	12" x 51"	14' of internal wire
Y99-FX150V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	150A	11" x 47"	12' of internal wire
Y99-FX33AV120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	33A	11" x 15"	8' of internal wire
Y99-FX80A120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	80A	11" x 33"	10' of internal wire
Y99-FX300V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	300	12" x 55"	16' of internal wire
Y99-FX350V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	350	17" x 45"	19' of internal wire
Y99-FXLP5V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	LP5	14" x 18"	5' of internal wire

Ordering Information for Accessories

Product Number	Description
Y99-THERMOSTAT	Thermostat in a NEMA 7 Housing
Y99-CYLPAD	12" x 12" Insulation Pad
Y99-REGHOOD	Regulator hood

Emissions Monitoring- *Storage Cabinets/Heated*

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



Emissions Monitoring – Storage Cabinets/Heated Enclosure

Series 9000

Heated Gas Cabinet

GAS CABINETS

Heated Cylinder Gas Cabinet

Description: The Series 9000 is a heated gas cylinder storage cabinet designed to maintain gas enclosure temperatures and prevent temperature swings that may affect your process chemicals. As temperatures dip to dew point and below, heavier gas components can settle at the bottom of the cylinder, while the lighter components accumulate closer to the top. Stratification can be minimized by mediating the enclosure temperature. The Series 9000 can protect against hydrocarbon dew point and condensation on the interior cylinder wall.

The standard Series 9000 enclosure houses cylinders up to 61"H x 12"D. The controls enclosure located at the top of the gas cabinet houses the power disconnect, thermostat controls, temperature gauge and gas delivery pressure gauge (with gas delivery panel options).

The gas cabinet enclosure utilizes reflective insulation technology to minimize BTU loss and keep cost of operation down.



Standard 2-Cylinder Model

Design Features

- Eleven (11) gauge cold rolled steel body
- Houses 1 or 2 full size gas cylinders
- High quality, fully seam welded construction
- 1/4" diamond-plate hard deck
- Self-closing, fully gasketed, triple-hinged doors
- Lockable safety latches on doors
- Unistrut® compatible interior mounting rails
- Cylinder clamps with tension straps
- Reflective white, high gloss, powder coat finish

Cabinets Options:

- 4 stage Jules Thompson Regulators
- EZ Gas Panels

FACILITIES REQUIREMENTS

Power	110V/20A	N/A
Sprinkler [if used]	30 psig	31 gpm

Standard Controls/Features

- Thermostat temperature control, heat only
- 475W
- Overtemp protection
- Temperature gauge
- Lockable power disconnect
- NEMA 4X controls enclosure

Dimensions

- 1-cyl.: 19"W x 72"H x 19"D
- 2-cyl.: 24"W x 72"H x 19"D

Gas Enclosure Options:

- Adjustable Cylinder Shelves
- Plumbing Backplanes
- Custom Cabinet Colors
- Custom Coating
- Custom Labeling and Logos
- 304SS or 316SS Enclosure

ORDERING INFORMATION

Part Number	Description
Y80-1CYLHTD	1 cylinder heated enclosure
Y80-2CYLHTD	2 cylinder heated enclosure

For Technical Support of this product call 1-800-939-5711 between 8 AM and 7 PM EST

Emissions Monitoring/EPA Supelcoat Products

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



Airgas
You'll find it with us.™

Emissions Monitoring/EPA – Supelcoat Products

Cyclone Technology Regulators w/Supelcoat™

Airgas' unique line of Cyclone Technology pressure regulators are designed to preserve the specific gas mixture. These have a unique internal design to ensure all surfaces are continually swept, thus not allowing any dropout regardless of differences in specific weight of the various compounds within the mixture. These regulators also have a proprietary Supelcoat™ coating that prevent interaction of corrosive and volatile compounds in high purity gas mixtures used in EPA analysis.

This unique internal design and coating will prevent compounds like Mercury from sticking to the wetted surfaces of the regulator as the gas passes through. Also for chromatography processes where the gas cannot be compromised by any interaction, this organic coating provides a complete inert surface.

Pressure Regulators

REGULATORS



The coating does not allow for any loss of a component of a gas such as reactive like reduced sulfur compounds, ammonia, NO₂, HCl. Environmental testing processes where the gases would have formaldehyde and HF would also benefit from using these products.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100,
Flow Capacity	Cv = 0.25 line Cv=0.06 single two stage
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Ports (6)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials of Construction	
Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Design Features

- All internal surfaces are continuously sweep with the unique cyclone technology, ensures the gas mixture is maintained
- Exceptional speed in recovery of base line after cylinder change out, no need for long purging
- Low internal volume
- Enhances analytical applications in that the gas and components within a gas mixture will not react to the metal of the components that the gas comes in contact with
- Ensures compounds within the gas such as Mercury are not diluted due to interaction or sticking to untreated metal
- Offered in both single and two stage designs
- Convoluted Hastelloy C-22 Diaphragms provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports (with optional bonnet vent adaptors) allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet (with optional collar-mount nuts) for easy panel mounting.
- High-Flow Capacity permits excellent pressure control for multi-instrument applications.
- Threadless Seat Design provides longer regulator life.
- Shipped ready for use

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Cyclone Technology Regulators w/Supelcoat™

Pressure Regulators

REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Line Regulator						
Y11-C441ASC	316 SS	1,250	30	600	30" Hg-0-30	NA
Y11-C441BSC	316 SS	1,250	60	1,080	0-100	NA
Y11-C441CSC	316 SS	1,250	100	1,140	0-200	NA
Single Stage						
Y11-C444A (CGA)SC	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y11-C444B (CGA)SC	316 SS	4,000	60	270	0-4,000	0-100
Y11-C444D (CGA)SC	316 SS	4,000	100	380	0-4,000	0-200
Two Stage						
Y12-C445A (CGA)SC	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y12-C445B (CGA)SC	316 SS	4,000	60	270	0-4,000	0-100
Y12-C445D (CGA)SC	316 SS	4,000	100	380	0-4,000	0-200

Available Options	
Product Number	Description
Y99-CHROMNUTV	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y15-418984	Wall Mount Bracket Line Regulator
Y99-26460	1/4" MNPT x 1/4" Compression
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder single and two stage
Y15-QMS2	Quick Mounting Option for 2 Cylinders single and two stage

Supelcoat™ Fittings, Valves and Flexible Hoses

Airgas' advanced offering of specialty coated fittings, valves and high pressure flexible hoses are designed to prevent interaction of low concentration corrosive and volatile compounds in the calibration gas mixtures used in critical environmental testing, plus in other applications where all the sample delivery components should be totally inert.

These fittings, hoses, and valves are coated with the proprietary Supelco Supelcoat™ coating which prevents any interaction of the reactive trace gas species with the "wetted" internal surfaces. The coating prevents any adsorption or "drop out" of low concentration components such as: reduced sulfur compounds; ammonia; NO₂; HCl; or mercury. Additionally, this coating is recommended when using calibration standards for the proposed new EPA regulation including testing for formaldehyde, HF and HBr.

When these fittings with this unique coating technology is combined with our Cyclone Technology regulators with Supelcoat, the result is the optimum components for gas delivery systems for EPA Protocol gases, ug/M³ level mercury standards, HCl mixtures for MATS compliance, and in numerous other analytical applications involving volatile and corrosive components.

Inert Coated Fittings

SUPELCOAT



Design Features

- Enhances analytical applications as high accuracy, trace level, calibration gas components will not react with the regulators, valves, piping or fittings comprising the sample handling system.
- Ensures compounds within the gas are delivered without reacting with reactive metal surfaces
- Increases speed of instrument response and consistency of run-to-run data.
- High pressure flexible hoses are of an internal corrugated bellows construction and welded for leak tight operation in all gases
- Shipped bagged and ready for use

Ordering Information

Nominal	Max	Nominal	Max
Y15-4PFLEX30FMSC	Flexible hose with armor casing 30" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y15-4PFLEX48FMSC	Flexible hose with armor casing 48" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y15-4PFLEX72FMSC	Flexible hose with armor casing 72" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y36-4DMFLSC	Multiturn packless diaphragm valve 1/4" mnpt x 1/4" fnpt long leg Supelcoat	316 stainless steel	3500 psig
Y36-4DMMSC	Multiturn packless diaphragm valve 1/4" mnpt x 1/4" mnpt Supelcoat	316 stainless steel	3500 psig
Y37-4DMFLSC	Quarter turn packless diaphragm valve 1/4" mnpt x 1/4" fnpt long leg Supelcoat	316 stainless steel	3500 psig
Y99-330CKSC	CGA 330 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y99-660CKSC	CGA 660 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y99-580CKSC	CGA 580 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y40-20626USC	1/8" x 0.085" wall(3.18 x 2.1mm) 50 foot coil Supelcoat	304 stainless steel	3000 psig
Y40-20527USC	Tubing 1/4" x 0.209" wall(6.35 x 5.3mm) 50 foot coil Supelcoat	304 stainless steel	3000 psig
Y99-26462SC	Male connector 1/4" mnpt x 1/8" compression Supelcoat	316 stainless steel	3000 psig
Y99-26460SC	Male connector 1/4" mnpt x 1/4" compression Supelcoat	316 stainless steel	3000 psig
Y99-413915SC	Male Elbow 1/4" mnpt x 1/8" compression Supelcoat	316 stainless steel	3000 psig
Y99-413914SC	Male Elbow 1/4" mnpt x 1/4" compression Supelcoat	316 stainless steel	3000 psig
Y99-413924SC	Tee compression ferrule 1/8" tod compression Supelcoat	316 stainless steel	3000 psig
Y99-413924SC	Tee compression ferrule 1/4" tod compression Supelcoat	316 stainless steel	3000 psig

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

www.airgas.com

PRESSURE REGULATORS

Ultra High-Purity



Design Features

Packless diaphragm valve built into the body

Unique internal design sweeps diaphragm cavity

Check valve CGA

Convuluted Hastelloy C-22 Diaphragms

provide superior leak integrity without contamination from a non-metallic liner or seal.

Bonnet Vent Ports (with optional bonnet vent adaptors)

allow venting of hazardous gases in the event of diaphragm failure.

Standard Threaded Bonnet (with optional collar-mount nuts)
for easy panel mounting.

Diaphragm Packless Valve (with 1/8" Compression fitting)
promotes system purity.

Threadless Seat Design
provides longer regulator life.

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat)

Description: This series of stainless steel single-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process faster and without contamination. This is an excellent regulator for EPA protocol gas mixtures, as well as other mixes used in high purity applications.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-8} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Materials	
Body	316 Stainless Steel
Bonnet	Nickle Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	Stainless Steel
Trim	Stainless Steel
Poppet Spring	Inconel

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250, 0-500 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	3 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.23/100 psi

Ultra High Purity Stainless Steel Single-Stage Models (Threadless Seat) Cont.

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11-CHP444A(CGA)	316 SS	4,000	30	190	0 - 4,000	30Hg - 0 - 30
Y11-CHP444B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y11-CHP444D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y11-CHP444F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400
Y11-CHP444G(CGA)	316 SS	4,000	500	985	0 - 4,000	0 - 1,000

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat)

Description: This series of stainless steel two-stage regulators are designed to have minimal gas paths in the regulators and prevent contaminants from entering during cylinder change out. These regulators have a check valve cylinder connection, packless diaphragm valve built into the regulator, and a 1/8" stainless steel compression fitting on the outlet. The regulator also has a unique design that causes the gas to continuously sweep the diaphragm chamber ensuring that there is no air or other contaminants in the regulator body. The diaphragm valve built into the body shortens the gas path allowing the gas to enter the process more quickly and without contamination. This makes it an excellent regulator for EPA protocol gas mixtures, as well as other high purity applications.

The two-stage design provides a constant delivery pressure and the supply inlet effect that causes the outlet pressure to change as the inlet pressure drops is less than .01/100 psi of inlet pressure change.

Convuluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. The metal-to-metal diaphragm seal prevents contamination by eliminating the need for a soft seal and provides a leak-rate design of less than 2×10^{-6} ccs helium. This minimizes cleanup time in vacuum purging and yields lower residual contaminant levels.

Captured bonnet ports with optional vent adaptors are standard on both stages and allow the venting of hazardous gases in the event of diaphragm failure. These regulators are ultrasonically cleaned for the most demanding high-purity service.

Ultra High-Purity

PRESSURE REGULATORS



Design Features

- Packless diaphragm valve built into the body**
- Unique internal design sweeps diaphragm cavity**
- Check valve CGA**
- Convuluted Hastelloy® C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports** (with optional bonnet vent adaptors)
allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet** (with optional collar-mount nuts)
for easy panel mounting.
- Diaphragm Packless Valve** (with 1/8" Compression fitting)
promotes system purity.
- Threadless Seat Design**
provides longer regulator life.

Specifications

Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100, 0-250 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Weight	4 lbs
Ports (5)	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/8" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials

Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Ultra High Purity Stainless Steel Two-Stage Models (Threadless Seat) Cont.

Ultra High-Purity

PRESSURE REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-CHP445A(CGA)	316 SS	4,000	30	190	0 - 4,000	30 Hg - 0 - 30
Y12-CHP445B(CGA)	316 SS	4,000	60	270	0 - 4,000	0 - 100
Y12-CHP445D(CGA)	316 SS	4,000	100	380	0 - 4,000	0 - 200
Y12-CHP445F(CGA)	316 SS	4,000	250	850	0 - 4,000	0 - 400

Available Options		
Product Number	Description	
Y99-CHROMNUT	Panel Mounting Nut	
Y99-BONNETADP	Bonnet Vent Adaptor	
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)	
Y15-QMS1	Quick Mounting Option for 1 Cylinder	
Y15-QMS2	Quick Mounting Option for 2 Cylinders	

Internally Coated Stainless Steel Two-Stage Model

Description: This two-stage stainless steel, high-purity regulator has been designed to provide precise pressure regulation for the Airgas EPA Protocol Mercury Standards. The two-stage body, diaphragms, internal carriers, internal compression members, 0.06 Cv poppets, conical compression springs, 1/4" compression fitting and CGA 660 nipple are all passivated using a proprietary coating. This unique coating mitigates the chances of any level of mercury attaching to the internal wetted components of this specialty regulator. The result is a two-stage pressure regulator that will not hold back or alter any level (PPM or PPB) of the mercury standard.

The internal threadless seat design of the two-stage stainless steel regulator is the same as used in our high-purity Y12-C445 series. The convoluted Hastelloy C-22 diaphragms provide excellent regulating characteristics and allow for internal vacuum purging. An outlet 1/4" compression fitting is provided to maintain optimum system purity.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	2-30 psig
Flow Capacity	Cv=0.06
Ambient Operating Temperature	-40° F to +150°F
Designed Leak Rate	2x10 ⁻⁸ ccs (helium)
Weight	4 lbs
Outlet	1/4" TOD Compression Fitting
Decay Inlet Characteristics	0.01/100 psi

Materials	
Body	316 Stainless Steel
Bonnet	Nickel Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C22
Gauges	2 1/2" Stainless Steel
Filter	316 Stainless Steel
Outlet Valve & Fitting	316 Stainless Steel
Trim	316 Stainless Steel

Single-Stage Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y12-HG445A660	316 SS	4,000	30	190	0 - 4000	30"Hg -0-30

Mercury Standards

PRESSURE REGULATORS



Design Features

- **Unique Proprietary Passivation Process**
special coating prevents mercury from "sticking" to the internal wetted components of the stainless steel regulator
- **Convoluted Hastelloy C-22 Diaphragms**
provide superior leak integrity without contamination from a non-metallic liner or seal
- **Threadless Seat Design**
provides longer regulator life

Natural Gas Standards Applications

Engineering the Right Solutions



Vacuum Flow Regulator

High Purity – Vacuum Actuated

REGULATORS

Description: The Airgas single-stage vacuum-actuated pressure regulator is designed for use with instruments that utilize a pump to draw calibration gas. This regulator will provide the exact amount of gas that the instrument requires. The simple-to-use regulator makes calibration quick and easy by eliminating the need for sample bags, flow meters and /or special training.



Design Features

Compact size

Small and light weight

Designed specially for instruments

utilizing a pump to draw up to 8" of water column pressure with a flow rate of 0-8 lpm of calibration gas

Specifications

Inlet Pressure	See table below
Operating Temperature Range	-20°F to 140°F (-28°C to 60°C)
Demand Pressure	8" H2O
Regulator Inlet Connection	¼" NPT female or C10
Outlet Connection	⅜" Barb
Gauge Size	1.5"
Shipping Weight	0.5 lbs

Materials

Regulator Body	Aluminum / Stainless Steel
Diaphragm	Buna-N / Viton
Seat	PTFE
Seal	EPDM/Viton
Bonnet	Clear Anodized Aluminum
Gauge	Stainless Steel / Brass

Ordering Information

Product Number	Body Material	Diaphragm Material	Inlet Connection	Gauge Material	O-Ring Material	Inlet Pressure Gauge (psig)	Inlet Pressure (psig)
Y11-2900(CGA)	Alum	Buna-N	¼" NPT Female	Brass	Viton	0-3000	3000
Y11-2900C10	Alum	Buna-N	C10	Brass	Viton	0-1200	1000
Y11-4900(CGA)	Alum	Viton	¼" NPT Female	Stainless Steel	Viton	0-3000	3000
Y11-4900C10	Alum	Viton	C10	Stainless Steel	Viton	0-1200	1000
Y11-5900(CGA)	Alum	Buna-N	¼" NPT Female	Stainless Steel	EPDM	0-3000	3000
Y11-5900C10	Alum	Buna-N	C10	Stainless Steel	EPDM	0-1200	1000
Y11-6900(CGA)	SS	Buna-N	¼" NPT Female	Stainless Steel	EPDM	0-3000	3000
Y11-6900C10	SS	Buna-N	C10	Stainless Steel	EPDM	0-1200	1000
Y11-7900(CGA)	SS	Viton	1/4" NPT Female	Stainless Steel	Viton	0-3000	3000
Y11-7900C10	SS	Viton	C10	Stainless Steel	Viton	0-1200	1000

Four-Stage Analytical Regulators

Description: Regulation of gas from high to low pressure generally results in a temperature drop inside the regulator. The larger the pressure drop ($P_1 - P_2 = P_d$), the greater the cooling effect. This is commonly known as Joule-Thompson (J-T) cooling effect. The J-T effect may subject the gas mixture to temperatures below the dew point of one or more components, resulting in separation and altering the composition of the mixture.

A common solution to maintain gas temperature above the dew point when regulating condensable calibration mixtures is to use an electrically-heated regulator. These regulators will maintain the gas temperature above the mixture dew point, however, their use can pose other operational and intrinsic issues such as: 1) the need for an electric power source (not so portable); 2) an explosion-proof rating (high cost and not portable) for use with flammable mixtures; and 3) inherently large temperature swings caused by wide heating cycles (common with electrically-controlled heated regulators) resulting in inconsistent analytical results.

The Airgas Model 144 regulator reduces cylinder pressure in four stages. The design incorporates three piston-sensed stages and a final fourth adjustable pressure stage with an Elgiloy® metal diaphragm. This technology provides distribution of the J-T cooling effect between multiple stages. As a result, reduction in cooling maintains gas temperatures above the dew point in the pressure regulator while preserving the mixture composition and achieving stable analytical results.



Design Features

- Four stages** reduce J-T cooling effect and maintains mixture composition
- Check valve cylinder connection** prevents air and contaminants from entering the gas stream during cylinder change out
- Diaphragm seal outlet valve** provides for flow shut-off and maintains gas purity
- Compact and light weight design** provides for easy transport
- No electricity** required allows for portability and use with flammable gases
- Pressure gauges** monitor cylinder and delivery pressures

Specifications

Inlet Pressure	3000 psig (207 bar) maximum and rated
Outlet Pressure Ranges	0 – 30 psig (2.1 bar), 0 – 75 psig (5.2 bar)
Flow Capacity	CV = 0.014
Operating Temperature	-40°F to 140°F (-40°C to 60°C) ambient
Designed Leak Rate	Bubble-tight (helium)
Decay Inlet Characteristic	0.4/100 psi
Regulator Inlet Port	1/4" NPT Female
Inlet Connection	Specify CGA
Outlet (Regulator Body)	1/8" NPT Female
Outlet Connection	1/4" NPT Female on outlet valve
Ports (4)	1/8" NPT Female
Inlet Filter	40 micron
Gauge	1.5" (41 mm) face
Weight	2 lbs.

Materials

Body, Pistons, Gauges	316 Stainless Steel
Diaphragm (4th Stage)	Elgiloy®
Seats	PFA
Seals	PTFE and Viton®
Bonnet	Brass nickel-plated
Filter	316 Stainless Steel

Ordering Information

Product Number	Material	Inlet Pressure (maximum)		Outlet Pressure (maximum)		Inlet Gauge		Delivery Gauge	
		psig	bar	psig	bar	psig	bar	psig	bar
Y12-1144A(CGA)-AL	316 Stainless Steel	3000	207	30	2.1	0 – 3000	0 – 207	0 – 60	0 – 4.1
Y12-1144B(CGA)-AL	316 Stainless Steel	3000	207	75	5.2	0 – 3000	0 – 207	0 – 100	0 – 6.9

* Specify CGA. Insert appropriate Compressed Gas Association connection number to complete the product number.
Example: Y12-1144A350-AL. Order by complete product number.

Series 9000

Heated Gas Cabinet

GAS CABINETS

Heated Cylinder Gas Cabinet

Description: The Series 9000 is a heated gas cylinder storage cabinet designed to maintain gas enclosure temperatures and prevent temperature swings that may affect your process chemicals. As temperatures dip to dew point and below, heavier gas components can settle at the bottom of the cylinder, while the lighter components accumulate closer to the top. Stratification can be minimized by mediating the enclosure temperature. The Series 9000 can protect against hydrocarbon dew point and condensation on the interior cylinder wall.

The standard Series 9000 enclosure houses cylinders up to 61"H x 12"D. The controls enclosure located at the top of the gas cabinet houses the power disconnect, thermostat controls, temperature gauge and gas delivery pressure gauge (with gas delivery panel options).

The gas cabinet enclosure utilizes reflective insulation technology to minimize BTU loss and keep cost of operation down.



Standard 2-Cylinder Model

Design Features

- Eleven (11) gauge cold rolled steel body
- Houses 1 or 2 full size gas cylinders
- High quality, fully seam welded construction
- 1/4" diamond-plate hard deck
- Self-closing, fully gasketed, triple-hinged doors
- Lockable safety latches on doors
- Unistrut® compatible interior mounting rails
- Cylinder clamps with tension straps
- Reflective white, high gloss, powder coat finish

Cabinets Options:

- 4 stage Jules Thompson Regulators
- EZ Gas Panels

FACILITIES REQUIREMENTS

Power	110V/20A	N/A
Sprinkler [if used]	30 psig	31 gpm

Standard Controls/Features

- Thermostat temperature control, heat only
- 475W
- Overtemp protection
- Temperature gauge
- Lockable power disconnect
- NEMA 4X controls enclosure

Dimensions

- 1-cyl.: 19"W x 72"H x 19"D
- 2-cyl.: 24"W x 72"H x 19"D

Gas Enclosure Options:

- Adjustable Cylinder Shelves
- Plumbing Backplanes
- Custom Cabinet Colors
- Custom Coating
- Custom Labeling and Logos
- 304SS or 316SS Enclosure

ORDERING INFORMATION

Part Number	Description
Y80-1CYLHTD	1 cylinder heated enclosure
Y80-2CYLHTD	2 cylinder heated enclosure

For Technical Support of this product call 1-800-939-5711 between 8 AM and 7 PM EST

Gas Cylinder Jackets

Cylinder Jackets

ACCESSORIES

Description: When mixing several hydrocarbon components in a cylinder and exposing the cylinder to low temperatures. Your hydrocarbon will become a sticky mess. The heavier molecules will stick to the cylinder walls, causing problems with the accuracy of the mixture.

To prevent this from happening, Airgas' cylinder jacket features a self-limiting heated cable that prevents overheating. This self-limiting cable heats up to 120F. It is designed to maintain the temperature of the hydrocarbon above its dew point, keeping it from stratifying.

Airgas' cylinder is constructed of materials approved by Underwriters Laboratories Inc. for Class 1 Division 2, Group B, C, and D hazardous locations.



NOTE: These jackets are not designed to heat up cylinders that have been in cold or freezing environments. Cold cylinders need to be brought up to temperature before one uses the Airgas cylinder blanket.

Excess heat lost can be experience through the top of the cylinder jacket. Airgas recommends the regulator hood to prevent this heat lost.

Other sizes are available, please call 800-939-5711.

Design Features

Prevents hydrocarbons mixtures from stratifying

heats and insulates to prevent the content form condensing

Silicone-impregnated fiberglass liner and polyester exterior

provides protects from the elements

Fluoropolymer overjeacket

protects the heat cable from corrosion

D-rings with Velcro line

protects the heat cable from corrosion

Applications

Natural gas, power plants and utilities

Specifications

Maintain Temperature	70F Ambient; 120F; 0F Ambient; 60F
Electrical Classifications	Class 1 Division 2 Groups B, C, and D
Power Requirements	120 Voltage (240 Voltage option)
Power Output	8 watts/ft at 50F
Flexible Conduit	10' of 3 color coded conductors

Ordering Information

Product Number	Material	Cylinder Size	Dimensions of Jacket	Electrical
Y99-FX200V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	200	12" x 51"	14' of internal wire
Y99-FX150V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	150A	11" x 47"	12' of internal wire
Y99-FX33AV120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	33A	11" x 15"	8' of internal wire
Y99-FX80A120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	80A	11" x 33"	10' of internal wire
Y99-FX300V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	300	12" x 55"	16' of internal wire
Y99-FX350V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	350	17" x 45"	19' of internal wire
Y99-FXLP5V120	Closed-cell foam insulation with silicone impregnated fiberglass line Polyester exterior	LP5	14" x 18"	5' of internal wire

Ordering Information for Accessories

Product Number	Description
Y99-THERMOSTAT	Thermostat in a NEMA 7 Housing
Y99-CYLPAD	12" x 12" Insulation Pad
Y99-REGHOOD	Regulator hood

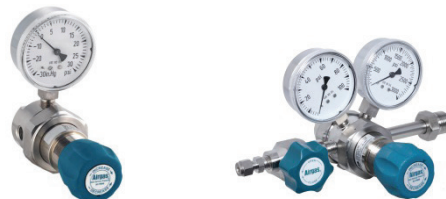
Cyclone Technology Regulators w/Supelcoat™

Airgas' unique line of Cyclone Technology pressure regulators are designed to preserve the specific gas mixture. These have a unique internal design to ensure all surfaces are continually swept, thus not allowing any dropout regardless of differences in specific weight of the various compounds within the mixture. These regulators also have a proprietary Supelcoat™ coating that prevent interaction of corrosive and volatile compounds in high purity gas mixtures used in EPA analysis.

This unique internal design and coating will prevent compounds like Mercury from sticking to the wetted surfaces of the regulator as the gas passes through. Also for chromatography processes where the gas cannot be compromised by any interaction, this organic coating provides a complete inert surface.

Pressure Regulators

REGULATORS



The coating does not allow for any loss of a component of a gas such as reactive like reduced sulfur compounds, ammonia, NO₂, HCl. Environmental testing processes where the gases would have formaldehyde and HF would also benefit from using these products.

Specifications	
Maximum Rated Inlet Pressure	4,000 psig
Outlet Pressure Ranges	0-30, 0-60, 0-100,
Flow Capacity	Cv = 0.25 line Cv=0.06 single two stage
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Rate	bubble tight
Ports (6)	¼" FNPT
Inlet	¼" FNPT
Outlet	¼" Compression
Decay Inlet Characteristic	0.01/100 psi

Materials of Construction	
Body	316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	Hastelloy C-22
Gauges	2 1/2" Stainless Steel
Outlet Valve	316 Stainless Steel
Trim	316 Stainless Steel
Poppet Spring	Inconel

Design Features

- All internal surfaces are continuously sweep with the unique cyclone technology, ensures the gas mixture is maintained
- Exceptional speed in recovery of base line after cylinder change out, no need for long purging
- Low internal volume
- Enhances analytical applications in that the gas and components within a gas mixture will not react to the metal of the components that the gas comes in contact with
- Ensures compounds within the gas such as Mercury are not diluted due to interaction or sticking to untreated metal
- Offered in both single and two stage designs
- Convuluted Hastelloy C-22 Diaphragms provide superior leak integrity without contamination from a non-metallic liner or seal.
- Bonnet Vent Ports (with optional bonnet vent adaptors) allow venting of hazardous gases in the event of diaphragm failure.
- Standard Threaded Bonnet (with optional collar-mount nuts) for easy panel mounting.
- High-Flow Capacity permits excellent pressure control for multi-instrument applications.
- Threadless Seat Design provides longer regulator life.
- Shipped ready for use

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

Cyclone Technology Regulators w/Supelcoat™

Pressure Regulators

REGULATORS

Ordering Information						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Line Regulator						
Y11-C441ASC	316 SS	1,250	30	600	30" Hg-0-30	NA
Y11-C441BSC	316 SS	1,250	60	1,080	0-100	NA
Y11-C441CSC	316 SS	1,250	100	1,140	0-200	NA
Single Stage						
Y11-C444A (CGA)SC	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y11-C444B (CGA)SC	316 SS	4,000	60	270	0-4,000	0-100
Y11-C444D (CGA)SC	316 SS	4,000	100	380	0-4,000	0-200
Two Stage						
Y12-C445A (CGA)SC	316 SS	4,000	30	190	0-4,000	30" Hg-0-30
Y12-C445B (CGA)SC	316 SS	4,000	60	270	0-4,000	0-100
Y12-C445D (CGA)SC	316 SS	4,000	100	380	0-4,000	0-200

Available Options	
Product Number	Description
Y99-CHROMNUTV	Panel Mounting Nut
Y99-BONNETADP	Bonnet Vent Adaptor
Y15-418984	Wall Mount Bracket Line Regulator
Y99-26460	1/4" MNPT x 1/4" Compression
Y99-4VCR	1/4" VCR® connection on Inlet/Outlet (VCR x 1/4" MNPT)
Y15-QMS1	Quick Mounting Option for 1 Cylinder single and two stage
Y15-QMS2	Quick Mounting Option for 2 Cylinders single and two stage

Supelcoat™ Fittings, Valves and Flexible Hoses

Airgas' advanced offering of specialty coated fittings, valves and high pressure flexible hoses are designed to prevent interaction of low concentration corrosive and volatile compounds in the calibration gas mixtures used in critical environmental testing, plus in other applications where all the sample delivery components should be totally inert.

These fittings, hoses, and valves are coated with the proprietary Supelco Supelcoat™ coating which prevents any interaction of the reactive trace gas species with the “wetted” internal surfaces. The coating prevents any adsorption or “drop out” of low concentration components such as: reduced sulfur compounds; ammonia; NO₂; HCl; or mercury. Additionally, this coating is recommended when using calibration standards for the proposed new EPA regulation including testing for formaldehyde, HF and HBr.

When these fittings with this unique coating technology is combined with our Cyclone Technology regulators with Supelcoat, the result is the optimum components for gas delivery systems for EPA Protocol gases, ug/M³ level mercury standards, HCl mixtures for MATS compliance, and in numerous other analytical applications involving volatile and corrosive components.

Inert Coated Fittings

SUPELCOAT



Design Features

- Enhances analytical applications as high accuracy, trace level, calibration gas components will not react with the regulators, valves, piping or fittings comprising the sample handling system.
- Ensures compounds within the gas are delivered without reacting with reactive metal surfaces
- Increases speed of instrument response and consistency of run-to-run data.
- High pressure flexible hoses are of an internal corrugated bellows construction and welded for leak tight operation in all gases
- Shipped bagged and ready for use

Ordering Information

Nominal	Max	Nominal	Max
Y15-4PFLEX30FMSC	Flexible hose with armor casing 30" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y15-4PFLEX48FMSC	Flexible hose with armor casing 48" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y15-4PFLEX72FMSC	Flexible hose with armor casing 72" lg. 1/4" mnpt x 1/4" fnpt Supelcoat	316 stainless steel	3500 psig
Y36-4DMFLSC	Multiturn packless diaphragm valve 1/4" mnpt x 1/4" fnpt long leg Supelcoat	316 stainless steel	3500 psig
Y36-4DMMSC	Multiturn packless diaphragm valve 1/4" mnpt x 1/4" mnpt Supelcoat	316 stainless steel	3500 psig
Y37-4DMFLSC	Quarter turn packless diaphragm valve 1/4" mnpt x 1/4" fnpt long leg Supelcoat	316 stainless steel	3500 psig
Y99-330CKSC	CGA 330 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y99-660CKSC	CGA 660 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y99-580CKSC	CGA 580 check valve nipple Supelcoat	316 stainless steel	3000 psig
Y40-20626USC	1/8" x 0.085" wall(3.18 x 2.1mm) 50 foot coil Supelcoat	304 stainless steel	3000 psig
Y40-20527USC	Tubing 1/4" x 0.209" wall(6.35 x 5.3mm) 50 foot coil Supelcoat	304 stainless steel	3000 psig
Y99-26462SC	Male connector 1/4" mnpt x 1/8" compression Supelcoat	316 stainless steel	3000 psig
Y99-26460SC	Male connector 1/4" mnpt x 1/4" compression Supelcoat	316 stainless steel	3000 psig
Y99-413915SC	Male Elbow 1/4" mnpt x 1/8" compression Supelcoat	316 stainless steel	3000 psig
Y99-413914SC	Male Elbow 1/4" mnpt x 1/4" compression Supelcoat	316 stainless steel	3000 psig
Y99-413924SC	Tee compression ferrule 1/8" tod compression Supelcoat	316 stainless steel	3000 psig
Y99-413924SC	Tee compression ferrule 1/4" tod compression Supelcoat	316 stainless steel	3000 psig

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

www.airgas.com

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

EZ Manual Gas Panels

Description: Airgas EZ Series Manual Gas Panels are designed for laboratories, universities and low grade nanotech applications for inert, flammable, oxidizer, and low-part corrosive and toxic gas mixtures. The compact design reduces the pressure and keeps gas volumes to a minimum. The panels come with standard features to ensure operator safety. The quarter turn valves provide a visual indication of open/close.

The EZ 2000 series has brass components with 316 stainless steel spool pieces. The EZ 4000 series has 316 stainless steel components with 316 stainless steel spool pieces. Both series have compression fittings to connect the components to the spool pieces. A 36" flexible pigtail is standard and a rigid 1/4" electropolished stainless steel accordion bend design pigtail is available as an option.

These gas panels can be used as a standalone process panel mounted to a wall or rack, and can be configured into our Lab or Semi grade gas cabinets. These panels are available in multiple configurations to fit most process system requirements. The standard manual panel is configured with one to six quarter turn manual valves and a regulator specifically sized for the system requirements and process gas.

The available options include Gas Detection tied to an Automatic Shut Off and both local and remote E Stop. Also excess flow shut off valve and custom shut down device using our Series 278 controller.



Process Gas Panels

GAS CABINETS



Design Features

- Brass or 316 Stainless steel components
- 316 Stainless Steel spool pieces
- Compression fittings on components and orbitally welded spool pieces
- Quarter turn valves to provide visual indication of open/close
- 1 – 5 valve designs configuration
- CGA or DISS cylinder connection
- CGA will have check valve incorporated into the nipple
- Single or two-stage regulator

Standard Features	EZ1V	EZ2V	EZ3V	EZ4V	EZ5V	EZ6V
UHP Diaphragm Regulator	X	X	X	X	X	X
Process Outlet Shut Off Valve	X	X	X	X	X	X
Process Inlet Isolation Valve		X	X	X	X	X
High Pressure Vent Valve			X	X	X	X
High Pressure Purge Valve				X	X	X
Purge Inlet Check Valve				X	X	X
Low Pressure Vent Valve			X	X	X	X
Vacuum Generator and Valve Assembly						X
HP and LP Gauges	X	X	X	X	X	X
All Welded spool pieces	X	X	X	X	X	X

Available Options	EZ1V	EZ2V	EZ3V	EZ4V	EZ5V	EZ6V
All welded construct and compression fitting connections	x	X	X	X	X	X
Automatic Shut Off Valve	x	X	X	X	X	X
Inlet or Outlet Filters	X	X	X	X	X	X
Excess Flow Valve	x	X	X	X	X	X
Inlet or Outlet Indicating Pressure Switches	x	X	X	X	X	X
Alarm Systems	x	X	X	X	X	X
Gas Detection	x	X	X	X	X	X
E Stop Box(Local or Remote)	x	X	X	X	X	X
Dual Outlets	x	X	X	X	X	X

GAS CABINETS

Process Gas Panels

EZ Manual Gas Panels Cont.

Ordering Information

Product Number	Component Material	Number of Valves	Single Stage Regulator	Two Stage Regulator
Y40-21EZ1V(CGA)	BRASS	1	Y	N
Y40-22EZ1V(CGA)	BRASS	1	N	Y
Y40-21EZ2V(CGA)	BRASS	2	Y	N
Y40-22EZ2V(CGA)	BRASS	2	N	Y
Y40-21EZ3V(CGA)	BRASS	3	Y	N
Y40-22EZ3V(CGA)	BRASS	3	N	Y
Y40-21EZ4V(CGA)	BRASS	4	Y	N
Y40-22EZ4V(CGA)	BRASS	4	N	Y
Y40-21EZ5V(CGA)	BRASS	5	Y	N
Y40-22EZ5V(CGA)	BRASS	5	N	Y
Y40-21EZ6V(CGA)	BRASS	6	Y	N
Y40-22EZ6V(CGA)	BRASS	6	N	Y
Y40-41EZ1V(CGA)	316 Stn Steel	1	Y	N
Y40-42EZ1V(CGA)	316 Stn Steel	1	N	Y
Y40-41EZ2V(CGA)	316 Stn Steel	2	Y	N
Y40-42EZ2V(CGA)	316 Stn Steel	2	N	Y
Y40-41EZ3V(CGA)	316 Stn Steel	3	Y	N
Y40-42EZ3V(CGA)	316 Stn Steel	3	N	Y
Y40-41EZ4V(CGA)	316 Stn Steel	4	Y	N
Y40-42EZ4V(CGA)	316 Stn Steel	4	N	Y
Y40-41EZ5V(CGA)	316 Stn Steel	5	Y	N
Y40-42EZ5V(CGA)	316 Stn Steel	5	N	Y
Y40-41EZ6V(CGA)	316 Stn Steel	6	Y	N
Y40-42EZ6V(CGA)	316 Stn Steel	6	N	Y

Airgas EZ manual gas panels can be easily mounted into either our Lab Series or Semi Grade line of gas storage cabinets

Please call 800-939-5711 for more information or to order

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Guide to Gas Cabinet Safety

To receive a copy of the Guide to Gas Cabinet Safety, please complete the form, and we will get back to you right away.

First Name *	<input type="text"/>
Last Name *	<input type="text"/>
Position Within Company *	<input type="text"/>
Company Name *	<input type="text"/>
Address *	<input type="text"/>
City *	<input type="text"/>
State *	<input type="text"/>
ZIP *	<input type="text"/>
Phone # *	<input type="text"/>
Email Address *	<input type="text"/>
Additional Comments or Questions	<div><input type="text"/><div>⬆⬇⬆</div></div>
	<div>SubmitClear</div>

* Required fields.

Gas Cabinets – Gas Cylinder Storage Cabinets

Engineering the Right Solutions



Airgas® Gas Cabinets

Lab Series Gas Cylinder Storage Cabinets

Description: Gas safety storage cabinets are designed, when connected to a properly designed ventilation system, to exhaust hazardous or flammable gases to a remote location in order to protect personnel from exposure. The use of gas cabinets provides a convenient way to achieve separation of gases by their classifications to satisfy both national and local fire and building codes. Cabinets can be fitted with manifolds, or our EZ Gas Panels, or other gas controls so that both the cylinder and the control system are enclosed. The cabinet has the capacity to allow 150–200 linear feet per minute of air to pass across the open window face to ensure that workers are not exposed.

Note: Airgas can design a gas cabinet for your specific application – from a simple storage cabinet, to one equipped with our EZ gas panels, or a fully automated cabinet. We also offer a complete portfolio of gas cabinets and VMB boxes. Please contact Airgas at 800-939-5711 between 8 am and 7 pm EST. Please see section on Automated Gas Cabinets.

Lab Series

GAS CABINET



Design Features

Protects Personnel

safely exhausts hazardous or flammable gases to remote location.

Satisfies both national and local fire and building codes
achieves separation of gases by their classification.

Specifications		
Weight	One cylinder	235 lbs.
	Two cylinders	283 lbs.
	Three cylinders	331 lbs.
	Four cylinders	391 lbs.
Dimensions	One cylinder	18" W x 18" D x 72" H
	Two cylinders	24" W x 18" D x 72" H
	Three cylinders	36" W x 18" D x 72" H
	Four cylinders	48" W x 18" D x 72" H

*specifications subject to change without notice

Materials	
Body	11 Gauge Steel
Fasteners	Stainless Steel
Finish	Epoxy Coating

Ordering Information		
Product Number	Material	Description
Y80-1CYLF	Steel-Coated Epoxy	One-Cylinder Cabinet
Y80-2CYLF	Steel-Coated Epoxy	Two-Cylinder Cabinet
Y80-3CYLF	Steel-Coated Epoxy	Three-Cylinder Cabinet
Y80-4CYLF	Steel-Coated Epoxy	Four-Cylinder Cabinet

Available Options

Product Number

Description

Y80-CABLKD

Keyed Door Latch(es)

Y80-CABLKW

Keyed Window Latch(es)

Y80-CABSHLF

Adjustable Small Cylinder Shelf

SPECIALTY GAS EQUIPMENT

Special Service

Semi Grade Series of Gas Cylinder Storage Cabinet



Description: The Airgas® Semi Grade Series of Gas Cylinder Storage Cabinets are engineered to meet tomorrow's standards for safe handling of your hazardous compressed and liquefied gases. The Semi Series is compliant with SEMI S2 (Safety Guidelines for Semiconductor Equipment Manufacturing), International Fire Code and exceeds all other applicable code requirements. Bearing the signature laser-cut Airgas intake grill, the Semi Series boasts a light gray, textured, ruggedized polyurethane finish. Standard sizes available in a one to four cylinder cabinet.

The Semi Series is designed with flexibility in mind. The standard Semi Series is fitted with plumbing backplanes, adjustable intake louvers, cylinder clamps w/tension straps, seismic tie-downs and fire-rated sprinkler. Customization and many options are available. For integrated gas panel options, using our EZ gas panels please call Airgas at 1-800-939-5711 between 8 am to 7 pm EST.

Standard Configurations

Model	Footprint
1-Cylinder	18"W x 19"D x 72"H
2-Cylinder	24"W x 19"D x 72"H
3-Cylinder	36"W x 19"D x 72"H
4-Cylinder	48"W x 19"D x 72"H

Optional Features

Adjustable cylinder shelves

Air intake filters

Chains in lieu of self-tightening straps

Exhaust pressure switch (monitored by others)

Custom Colors

Custom laser-cut logo intake grille

Custom sizes

Standard Features

Eleven (11) gauge cold rolled steel body

High quality, fully seam-welded construction

Low profile 1/4" diamond-plate hard-deck

Gasketed, fire-rated, wire reinforced safety glass view window

Protective Lexan® shield behind access door

Self-closing, self-latching, fully gasketed, triple-hinge doors

Lockable safety latches

Lockable, self-closing access door

Fire-rated sprinkler head, 31gpm, 165°F

Specifications

Model	Exhaust Configuration	*Maximum Exhaust Flow
Y80-AV1CYL	One 6" OD stub	200 cfm
Y80-AV2CYL	One 6" OD stub	300 cfm
Y80-AV3CYL	Two 6" OD stubs	450 cfm
Y80-AV4CYL	Two 6" OD stubs	600 cfm
Y80-AV1DEW	One 8" OD stub	500 cfm
Y80-AV2DEW	Two 8" OD stubs	1000 cfm

*Depending on specific gas, combined volumes, RFO sizes, site conditions, etc., this flow may be higher.

Gas Cabinets- *EZ Gas Cabinets for Non Hazardous Gases*

Gas Cabinets –EZ Gas Cabinets for Non Hazardous Gases

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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You'll find it with us.™

EZ Manual Gas Panels

Description: Airgas EZ Series Manual Gas Panels are designed for laboratories, universities and low grade nanotech applications for inert, flammable, oxidizer, and low-part corrosive and toxic gas mixtures. The compact design reduces the pressure and keeps gas volumes to a minimum. The panels come with standard features to ensure operator safety. The quarter turn valves provide a visual indication of open/close.

The EZ 2000 series has brass components with 316 stainless steel spool pieces. The EZ 4000 series has 316 stainless steel components with 316 stainless steel spool pieces. Both series have compression fittings to connect the components to the spool pieces. A 36" flexible pigtail is standard and a rigid 1/4" electropolished stainless steel accordion bend design pigtail is available as an option.

These gas panels can be used as a standalone process panel mounted to a wall or rack, and can be configured into our Lab or Semi grade gas cabinets. These panels are available in multiple configurations to fit most process system requirements. The standard manual panel is configured with one to six quarter turn manual valves and a regulator specifically sized for the system requirements and process gas.

The available options include Gas Detection tied to an Automatic Shut Off and both local and remote E Stop. Also excess flow shut off valve and custom shut down device using our Series 278 controller.



Process Gas Panels

GAS CABINETS



Design Features

- Brass or 316 Stainless steel components
- 316 Stainless Steel spool pieces
- Compression fittings on components and orbitally welded spool pieces
- Quarter turn valves to provide visual indication of open/close
- 1 – 5 valve designs configuration
- CGA or DISS cylinder connection
- CGA will have check valve incorporated into the nipple
- Single or two-stage regulator

Standard Features	EZ1V	EZ2V	EZ3V	EZ4V	EZ5V	EZ6V
UHP Diaphragm Regulator	X	X	X	X	X	X
Process Outlet Shut Off Valve	X	X	X	X	X	X
Process Inlet Isolation Valve		X	X	X	X	X
High Pressure Vent Valve			X	X	X	X
High Pressure Purge Valve				X	X	X
Purge Inlet Check Valve				X	X	X
Low Pressure Vent Valve			X	X	X	X
Vacuum Generator and Valve Assembly						X
HP and LP Gauges	X	X	X	X	X	X
All Welded spool pieces	X	X	X	X	X	X

Available Options	EZ1V	EZ2V	EZ3V	EZ4V	EZ5V	EZ6V
All welded construct and compression fitting connections	x	X	X	X	X	X
Automatic Shut Off Valve	x	X	X	X	X	X
Inlet or Outlet Filters	X	X	X	X	X	X
Excess Flow Valve	x	X	X	X	X	X
Inlet or Outlet Indicating Pressure Switches	x	X	X	X	X	X
Alarm Systems	x	X	X	X	X	X
Gas Detection	x	X	X	X	X	X
E Stop Box(Local or Remote)	x	X	X	X	X	X
Dual Outlets	x	X	X	X	X	X

GAS CABINETS

Process Gas Panels

EZ Manual Gas Panels Cont.

Ordering Information

Product Number	Component Material	Number of Valves	Single Stage Regulator	Two Stage Regulator
Y40-21EZ1V(CGA)	BRASS	1	Y	N
Y40-22EZ1V(CGA)	BRASS	1	N	Y
Y40-21EZ2V(CGA)	BRASS	2	Y	N
Y40-22EZ2V(CGA)	BRASS	2	N	Y
Y40-21EZ3V(CGA)	BRASS	3	Y	N
Y40-22EZ3V(CGA)	BRASS	3	N	Y
Y40-21EZ4V(CGA)	BRASS	4	Y	N
Y40-22EZ4V(CGA)	BRASS	4	N	Y
Y40-21EZ5V(CGA)	BRASS	5	Y	N
Y40-22EZ5V(CGA)	BRASS	5	N	Y
Y40-21EZ6V(CGA)	BRASS	6	Y	N
Y40-22EZ6V(CGA)	BRASS	6	N	Y
Y40-41EZ1V(CGA)	316 Stn Steel	1	Y	N
Y40-42EZ1V(CGA)	316 Stn Steel	1	N	Y
Y40-41EZ2V(CGA)	316 Stn Steel	2	Y	N
Y40-42EZ2V(CGA)	316 Stn Steel	2	N	Y
Y40-41EZ3V(CGA)	316 Stn Steel	3	Y	N
Y40-42EZ3V(CGA)	316 Stn Steel	3	N	Y
Y40-41EZ4V(CGA)	316 Stn Steel	4	Y	N
Y40-42EZ4V(CGA)	316 Stn Steel	4	N	Y
Y40-41EZ5V(CGA)	316 Stn Steel	5	Y	N
Y40-42EZ5V(CGA)	316 Stn Steel	5	N	Y
Y40-41EZ6V(CGA)	316 Stn Steel	6	Y	N
Y40-42EZ6V(CGA)	316 Stn Steel	6	N	Y

Airgas EZ manual gas panels can be easily mounted into either our Lab Series or Semi Grade line of gas storage cabinets

Please call 800-939-5711 for more information or to order

Specialty Gas Equipment

Gas Cabinet Controller

Description: The Airgas series 278 series controller is essential for safely controlling the gases in a gas cabinet in the event of an upset condition.

The controller has a local E Stop that can be interconnected to a remote E Stop to shut down the gas flow from the cylinder using an Automatic Shut Off Valve (ASO). The controller also has a power supply for a gas detector as well as shut down in the event the detector alarms. Alarms are also available for Ventilation Loss, and a customer specified alarm. The customer specified function can be for high or low pressure, open window or door, or other alarm the customer specifies.

The controller has both visual indication status with red/green indicating lights but also an audible alarm that can be silenced.

Specifications	
AC input	115v
DC output	24v DC @ 1 amp max
Input Air Supply Pressure	100 psi
Dimensions	8 1/4" (L) X 4" (H) X 6 1/4" (W)
Mounting	Adjustable swing mount
Input Contacts	Only dry contacts supported

Ordering Information	
Product Number	Description
Y78-GCCTRLR	278 Series Gas Cabinet Controller
Y78-RESTOP	278 Series Remote E Stop

Gas Cabinet Controller

GAS CABINETS



Optional Remote E Stop

Design Features

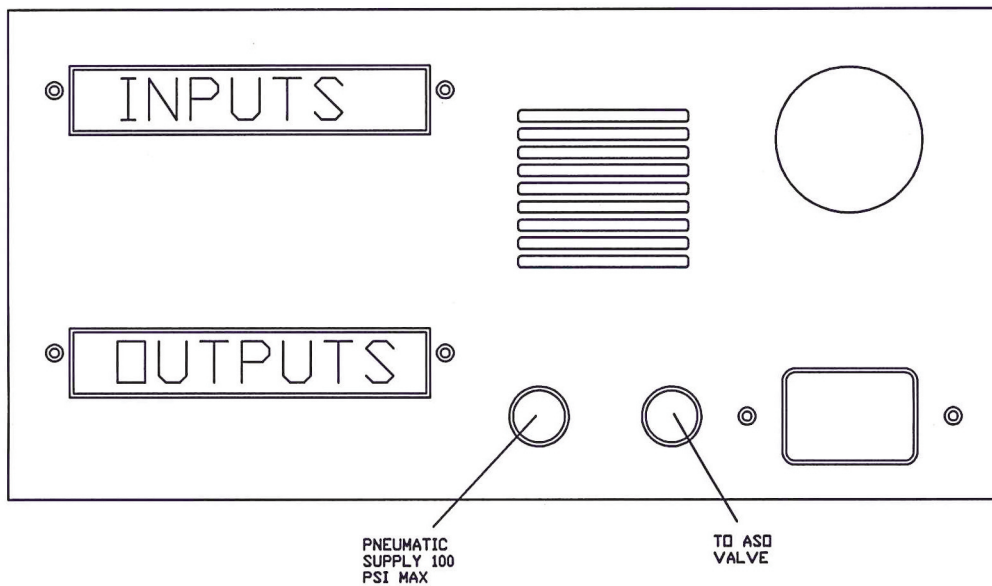
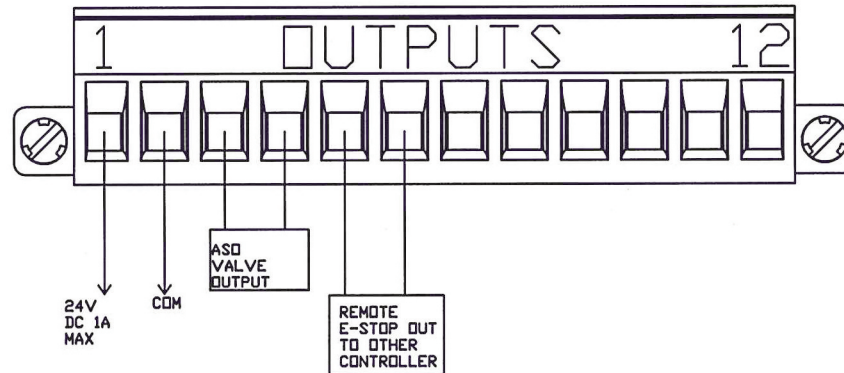
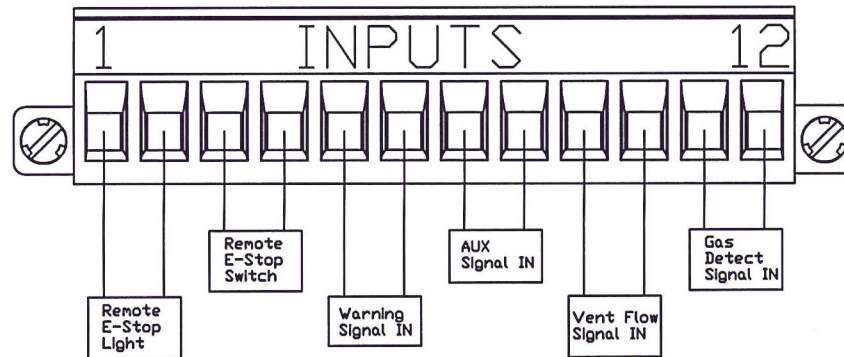
- Integral E Stop
- Alarms both visual and audible
 - E Stop
 - Ventilation Loss
 - ASO Activation
 - Customer Specified
- Visual power indicator

Specialty Gas Equipment

Gas Cabinet Controller Cont.

Gas Cabinet Controller

GAS CABINETS



Gas Cabinets- *EZ Gas Cabinets for Hazardous Gases*

Specialty Gases and Equipment Product Reference Guide

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Gas Cabinets –EZ Gas Cabinets for Hazardous Gases

Laboratory 1000 Series Gas Cabinet for Flammable Gases

GAS CABINETS



Description: The Lab 1000 Series gas cabinets are designed to meet the safe storage requirements for flammable gases while conforming to the guidelines provided in the applicable national codes, such as the International Fire Code (IFC), International Building Code (IBC), International Mechanical Code (IMC) and the National Fire Protection Agency (NFPA).

The single-cylinder flammable gas cabinet includes a regulator, gas detector, automatic flow shutoff valve, an excess flow valve and a flashback arrestor.

The two-cylinder flammable gas cabinet includes a changeover manifold, gas detector, automatic flow shutoff valve, an excess flow valve and a flashback arrestor.

A control box is provided as a standard with the cabinet to provide power to the gas detector as well as offer an emergency stop button and commands to the automatic shutoff valve.

Additional options such as pressure and flow monitoring, remote E-stop, remote gas monitoring or VCR connections with clean room assembly are available to meet your specific process requirement.

Design Features

Designed for code conformance

11-gauge steel cabinet construction with self-closing doors and windows and internal sprinkler head

Protects personnel

Safely exhausts hazardous gases

Gas detection with cabinet mounted display

View gas levels from outside the cabinet, automatic shutdown at alarm levels

Automatic Shutdown

Normally closed shutoff valve actuated by emergency stop button or high gas concentration

Standard Configurations

Laboratory 1000 Series Flammable Gas Cabinet with Individual Process Panel Part # V89 ES1452

24" wide steel cylinder cabinet with individual brass pressure regulator to house one process cylinder and one spare cylinder. Cabinet also contains an excess flow valve and flashback arrestor mounted downstream of the regulator. A gas detector and control box mounted to the top of the cabinet provides a means of shutting down the system in the event of a leak. Constructed with NPT connections.

Laboratory 1000 Series Flammable Gas Cabinet with Automatic Changeover Manifold Part # V89 ES1450

24" wide steel cylinder cabinet with brass automatic changeover manifold to house two process cylinders. The panel allows for automatic switching to second cylinder upon depletion of the first cylinder. Cabinet also contains an excess flow valve and flashback arrestor mounted downstream of the manifold. A gas detector and control box mounted to the top of the cabinet provides a means of shutting down the system in the event of a leak. Constructed with NPT connections.

Facilities Requirements

Power	110 VAC	N/A
Pneumatic Supply (N ₂ or clean, dry air)	adjustable to 90 psig	1 slm max.
Sprinkler	30 psig	31 gpm
Exhaust	>0.15" H2O	300scfm (2-cylinder)

Please call 1-800-282-1524 for technical sales and support of this product.

Laboratory 2000 Series Gas Cabinets for Toxic and Corrosive Gases

GAS CABINETS



Design Features

Designed for code conformance

11-gauge steel cabinet construction with self-closing doors and windows and internal sprinkler head

Protects personnel

Safely exhausts hazardous gases

Gas detection with cabinet mounted display

View gas levels from outside the cabinet, automatic shutdown at alarm levels

Automatic Shutdown

Normally closed shutoff valve actuated by emergency stop button or high gas concentration

Description: The Lab 2000 Series gas cabinets are designed to meet the safe storage requirements for toxic and corrosive gases while conforming to the guidelines provided in the applicable national codes, such as the International Fire Code (IFC), International Building Code (IBC), International Mechanical Code (IMC) and the National Fire Protection Agency (NFPA).

The single-cylinder toxic and corrosive gas cabinet includes a regulator with purge controls utilizing a vacuum venturi, gas detector and automatic flow shut-off valve.

The two-cylinder toxic and corrosive gas cabinet includes a changeover manifold with purge controls utilizing a vacuum venturi, gas detector and automatic flow shutoff valve.

A control box is provided as a standard with the cabinet to provide power to the gas detector as well as offer an emergency stop button and commands to the automatic shutoff valve.

Additional options such as pressure and flow monitoring, remote E-stop, remote gas monitoring or VCR connections with clean room assembly are available to meet your specific process requirement.

Standard Configurations

Laboratory 2000 Series Toxic & Corrosive Gas Cabinet with Individual Process Panel
Part # V89 ES1453

24" wide steel cylinder cabinet with individual stainless steel pressure regulator to house one process cylinder and a purge gas cylinder mounted inside the cabinet. Cabinet also contains a purge gas regulator for vacuum motive supply. A gas detector and control box mounted to the top of the cabinet provides a means of shutting down the system in the event of a leak. Constructed with NPT connections.

Laboratory 2000 Series Toxic & Corrosive Gas Cabinet with Automatic Changeover Manifold
Part # V89 ES1451

36" wide steel cylinder cabinet with stainless steel changeover manifold to house two process gas cylinders and a purge gas cylinder mounted outside the cabinet. Cabinet also contains a purge gas regulator for vacuum motive supply. A gas detector and control box mounted to the top of the cabinet provides a means of shutting down the system in the event of a leak. Constructed with NPT connections.

Facilities Requirements

Power	110 VAC	N/A
Pneumatic Supply (N ₂ or clean, dry air)	adjustable to 90 psig	1 slm max.
Process Purge (N ₂ cylinder)	adjustable to 80 psig	30 slm
Vacuum Drive (N ₂ from cylinder or house line)	adjustable to 85 psig	85 slm max
Sprinkler	30 psig	31 gpm
Exhaust	>0.15" H2O	300scfm (2-cylinder)

Laboratory 3000 Series Gas Cabinet for Highly Toxic & Pyrophoric Gases

GAS CABINETS



Description: The Lab 3000 Series gas cabinets are designed to meet the safe storage requirements for highly toxic and pyrophoric gases while conforming to the guidelines provided in the applicable national codes, such as the International Fire Code (IFC), International Building Code (IBC), International Mechanical Code (IMC) and the National Fire Protection Agency (NFPA).

The highly toxic and pyrophoric fully automatic group of cabinets includes a process panel with purge controls utilizing a vacuum venturi, gas detector and automatic flow shutoff valve.

A touch-screen PLC is provided as a standard with the cabinet to provide automated control of all critical functions such as purge sequence, emergency shut-off, alarm outputs and exhaust pressure monitor. Additional options such as automatic switchover, integrated scales, purgeable splitters, RFO, filtration and purification are available to meet your specific process requirements.

Standard Configurations

Laboratory 3000 Series Highly Toxic & Pyrophoric Gas Cabinet

24" wide steel cylinder cabinet with individual process panel to house one process cylinder and a purge gas cylinder mounted inside the cabinet. Cabinet also contains a purge gas regulator for vacuum motive supply, gas detector and automatic flow shut-off valve. A touch-screen PLC mounted to the top of the cabinet provides automated control of critical functions. Clean room assembly with VCR connections.

Design Features

Designed for code conformance

11-gauge steel cabinet construction with self-closing doors and windows and internal sprinkler head

Protects personnel

Safely exhausts hazardous gases

Gas detection with cabinet mounted display

View gas levels from outside the cabinet, automatic shutdown at alarm levels

PLC Controls

Color touch screen interface, auto-sequenced routings of operation and maintenance

Facilities Requirements

Power	115 V/3A	N/A
Pneumatic Supply (N ₂ or clean, dry air)	adjustable to 90 psig	1 slm max.
Process Purge (N ₂ cylinder)	adjustable to 80 psig	30 slm
Vacuum Drive (N ₂ from cylinder or house line)	adjustable to 85 psig	85 slm max
Process Vent	>1.0" WC	100 slm
Sprinkler	30 psig	31 gpm
Exhaust	>0.15" H ₂ O	300scfm (2-cylinder)

Please call 1-800-282-1524 for technical sales and support of this product.

Gas Cabinets- *Nanotech and Semiconductor Series*

Gas Cabinets – EZ Gas Cabinets for Hazardous Gases

Specialty Gases and Equipment Product Reference Guide

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Nano Semi 1000 Series Gas Cabinet for Flammable Gases

GAS CABINETS



Description: The Nano Semi 1000 Series gas cabinets are designed to meet the safe storage requirements for flammable gases while conforming to the guidelines provided in the applicable national codes, such as the International Fire Code (IFC), International Building Code (IBC), International Mechanical Code (IMC) and the National Fire Protection Agency (NFPA).

The flammable group of cabinets includes a process panel with regulator, gas detector and automatic flow shutoff valve.

A cabinet top controller is provided as a standard with the cabinet to provide automated control of all critical functions such as emergency shut-off, alarm outputs and exhaust pressure switch. Additional options such as automatic switchover, integrated scales, adjustable cylinder shelves, and restrictive flow orifices are available to meet your specific process requirements.

Standard Configurations

Nano Semi 1000 Series Flammable Gas Cabinet

24" wide steel cylinder cabinet with individual process panel to house one process cylinder and one spare cylinder. A gas detector and control box mounted to the top of the cabinet provides a means of shutting down the system in the event of a leak. Clean room assembly with VCR connections.

Design Features

Designed for code conformance

11-gauge steel cabinet construction with self-closing doors and windows and internal sprinkler head

Protects personnel

Safely exhausts hazardous gases

Gas detection with cabinet mounted display

View gas levels from outside the cabinet, automatic shutdown at alarm levels

Cabinet Top Controller

Auto shutdown of process gas panels with emergency shutdown button

Facilities Requirements

Power	115 V	N/A
Pneumatic Supply (N ₂ or clean, dry air)	adjustable to 90 psig	1 slm max.
Process Vent	>1.0" WC	100 slm
Sprinkler	30 psig	31 gpm
Exhaust	>0.15" H2O	300scfm (2-cylinder)

Please call 1-800-282-1524 for technical sales and support of this product.

Nano Semi 2000 Series Gas Cabinet for Toxic and Corrosive Gases

GAS CABINETS



Description: The Nano Semi 2000 Series gas cabinets are designed to meet the safe storage requirements for toxic and corrosive gases while conforming to the guidelines provided in the applicable national codes, such as the International Fire Code (IFC), International Building Code (IBC), International Mechanical Code (IMC) and the National Fire Protection Agency (NFPA).

The toxic and corrosive group of cabinets includes a process panel with regulator, gas detector and automatic flow shutoff valve.

A cabinet top controller is provided as a standard with the cabinet to provide automated control of all critical functions such as emergency shut-off, alarm outputs and exhaust pressure switch. Additional options such as automatic switchover, integrated scales, adjustable cylinder shelves, and restrictive flow orifices are available to meet your specific process requirements.

Standard Configurations

Nano Semi 2000 Series Toxic and Corrosive Gas Cabinet

24" wide steel cylinder cabinet with individual stainless steel pressure regulator to house one process cylinder and a purge gas cylinder mounted inside the cabinet. A gas detector and control box mounted to the top of the cabinet provides a means of shutting down the system in the event of a leak. Clean room assembly with VCR connections.

Design Features

Designed for code conformance

11-gauge steel cabinet construction with self-closing doors and windows and internal sprinkler head

Protects personnel

Safely exhausts hazardous gases

Gas detection with cabinet mounted display

View gas levels from outside the cabinet, automatic shutdown at alarm levels

Cabinet Top Controller

Auto shutdown of process gas panels with emergency shutdown button

Facilities Requirements

Power	115 V/3A	N/A
Pneumatic Supply (N ₂ or clean, dry air)	adjustable to 90 psig	1 slm max.
Process Purge (N ₂ cylinder)	adjustable to 80 psig	30 slm
Vacuum Drive (N ₂ from cylinder or house line)	adjustable to 85 psig	85 slm max
Process Vent	>1.0" WC	100 slm
Sprinkler	30 psig	31 gpm
Exhaust	>0.15" H ₂ O	300scfm (2-cylinder)

Please call 1-800-282-1524 for technical sales and support of this product.

Nano Semi 3000 Series Gas Cabinet for Highly Toxic & Pyrophoric Gases

GAS CABINETS



Description: The Nano Semi 3000 Series gas cabinets are designed to meet the safe storage requirements for highly toxic and pyrophoric gases while conforming to the guidelines provided in the applicable national codes, such as the International Fire Code (IFC), International Building Code (IBC), International Mechanical Code (IMC) and the National Fire Protection Agency (NFPA).

The highly toxic and pyrophoric fully automatic group of cabinets includes a process panel with purge controls utilizing a vacuum venturi, gas detector and automatic flow shutoff valve.

A touch-screen PLC is provided as a standard with the cabinet to provide automated control of all critical functions such as purge sequence, emergency shut-off, alarm outputs and exhaust pressure monitor. Additional options such as automatic switchover, integrated scales, purgeable splitters, RFO, filtration and purification are available to meet your specific process requirements.

Standard Configurations

Nano Semi 3000 Series Highly Toxic & Pyrophoric Gas Cabinet

24" wide steel cylinder cabinet with individual process panel to house one process cylinder and a purge gas cylinder mounted inside the cabinet. Cabinet also contains a purge gas regulator for vacuum motive supply, gas detector and automatic flow shut-off valve. A touch-screen PLC mounted to the top of the cabinet provides automated control of critical functions. Clean room assembly with VCR connections.

Design Features

Designed for code conformance

11-gauge steel cabinet construction with self-closing doors and windows and internal sprinkler head

Protects personnel

Safely exhausts hazardous gases

Gas detection with cabinet mounted display

View gas levels from outside the cabinet, automatic shutdown at alarm levels

PLC Controls

Color touch screen interface, auto-sequenced routings of operation and maintenance

Facilities Requirements

Power	115	N/A
Pneumatic Supply (N ₂ or clean, dry air)	adjustable to 90 psig	1 slm max.
Process Purge (N ₂ cylinder)	adjustable to 80 psig	30 slm
Vacuum Drive (N ₂ from cylinder or house line)	adjustable to 85 psig	85 slm max
Process Vent	>1.0" WC	100 slm
Sprinkler	30 psig	31 gpm
Exhaust	>0.15" H ₂ O	300scfm (2-cylinder)

Please call 1-800-282-1524 for technical sales and support of this product.

GAS CABINETS

Nano Semi 7000 Series Valve Manifold Box



Description: The Nano Semi 7000 Series Valve Manifold Box (VMB), is also representative of Airgas® continuous drive and commitment to providing the industry's safest and most reliable UHP specialty gas equipment available. Mass customization and modular design of the gas sticks and controls architecture have combined to widen the product configuration spectrum and greatly increase user flexibility.

The NS 7000 Series VMB makes it easy to meet your exact needs while allowing for ease of service and upgradeability. Start by choosing one of several *core* VMB configurations. Begin customizing by selecting the number of sticks, then optionalize each stick with any number of options including: regulation, transducers, filtration, excess flow sensors, RFO's and more! Airgas will walk you through this process in a simple step by step manner. Airgas Sales Engineers are always available to walk you through the customization process, either by phone or in person.

Standard Configurations

4-stick	0-4 sticks populated
8-stick	0-8 sticks populated
8-stick Dual Gas	0-4 sticks for Gas A, 0-4 sticks for Gas B

Process Panel Features

Ultra High Purity (UHP) 316L SS / VAR construction
Surface finish 10 Ra avg. or better
Vacuum assisted purging
UHP orbitally welded w/ strategic VCR® placement
Helium leak tested to 1.0 X 10⁻⁹ atm*cc/s
CLASS 100 / CLASS 10 clean room assembly & test

Stick Options

Regulation
Transducer (Gauge Standard)
Excess Flow Sensor
Filtration

Controls Features

PLC Control of all critical functions
10.4" color touch screen interface
Proven auto-sequenced routines of operation & maintenance
User settable limits for all process & alarm parameters
Exhaust pressure monitor
On-screen warnings, alarms, prompting and instructions
Emergency Off (EMO)
EMO and EGO Inputs
Alarm Outputs
Multi-level password protection
Diagnostics screen
Valve cycle count screen
Z-Purge ready for Class I Div II compliance

VMB Options

Gas Leak Sensor
UVIR

Facilities Requirements

Vacuum Drive	adjustable to 85 psig	85 slm max.
Pneumatic Supply	adjustable to 90 psig	1 slm max.
Process Purge	adjustable to 80 psig	30 slm
Process Vent	>1.0" WC	100 slm
Power	110V, 3A	N/A
Sprinkler (if required)	30 psig	31 gpm
Exhaust	>0.15" H2O	250scfm

For technical support and or ordering information, please call 1-800-539-5711 8 AM - 7 PM EST.

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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RDF Equipment and Accessories Catalog

A Specialty Gases and Equipment Supplement



Airgas®
an Air Liquide company



Refrigerators, Dewars, Freezers and Accessories
Airgas National Technical Services Support 1-877-ASG-4-GAS
Or, visit us online at www.airgas.com

When you need the right cryogenic liquid and equipment...You'll find it with usSM.

From cryogenic refrigerators, freezers, and dewars to transfer hoses, low-level alarms, safety products, liquid nitrogen, and even dry ice — Airgas is the one source more life science laboratories turn to for help in efficiently managing their cryogen operations.

Airgas partners with Taylor-Wharton to jointly market the Taylor-Wharton RDF line to the life sciences industry. With the combination of reliable Airgas cryogens, Taylor-Wharton refrigerators, freezers, dewars, and equipment accessories, Airgas helps reduce the headaches and hassles of long-term sample storage.

Airgas also offers the right cryogenic expertise.

With Airgas, you get the support of some of the most knowledgeable technical and customer support specialists in the industry. We know the needs of life sciences laboratories. Highly trained technicians will review your needs and provide the right products and services according to rigid standards to make sure you get precise, consistent performance.

Call on us for:

- Applications expertise
- On-site gas and equipment inventory management
- Regulatory expertise
- Distribution synergies with other gases, equipment and safety supplies
- Vendor consolidation
- Online ordering and account management

Safe Handling of Cryogenic Liquids

Most cryogenic liquids are odorless, colorless, and tasteless when vaporized. When cryogenic liquids are exposed to the atmosphere, the cold boil-off gases condense the moisture in the air, creating a highly visible fog.

The products found in liquid containers are nitrogen, argon, oxygen, helium, carbon dioxide and nitrous oxide. The containers are double-walled, vacuum vessels with multilayer insulation in the annular space. The two primary advantages of a liquid container are that it contains a large volume of gas at a relatively low pressure and it provides a source of cryogenic liquids which can be easily handled.

Although these containers are well insulated, heat will continuously leak into the product, due to the extremely large temperature difference between the cryogenic liquid and the ambient environment. The heat leak will cause some vaporization to occur. Vaporized product, if not used, will collect in the vapor space above the liquid and build pressure—called the head pressure. Head pressure will build in the container and periodically vent via the pressure relief valve. Vaporization rates will vary and may be as low as 0.4% or as high as 3% of the container's volume per day. This is a normal and safe function of the container.

All cryogenic liquids produce large volumes of gas when they vaporize. The expansion ratio is the amount of gas generated from a given amount of liquid. Table 1 shows the liquid-to-gas expansion ratios for the common cryogenic fluids. If a sufficient amount of liquid is vaporized within a closed container, it will produce enormous pressures that could rupture the vessel. For this reason, cryogenic liquid containers are protected with multiple pressure relief devices. Similarly, any system for the storage and delivery of cryogenic liquids should be carefully designed to avoid trapping cryogenic liquid at any point in the system by installing a relief device.

Vaporization of cryogenic liquids (except oxygen) in an enclosed area can cause asphyxiation. Use of a low-oxygen detector is highly recommended. Vaporization of liquid oxygen can produce an oxygen-rich atmosphere. Although oxygen is not flammable, it is an oxidant and will support and accelerate the combustion of other materials. Vaporization of liquid hydrogen can form an extremely flammable mixture with air.

Always handle these liquids carefully. Because of their extremely low temperatures, they can produce cryogenic burns and frostbite. When spilled on a surface, they tend to cover it completely and, therefore, cool a large area.

The vapors from these liquids are also extremely cold and can produce burns. Even brief exposure, may damage delicate tissues, such as the eyes.

Following are some general guidelines to use when working with cryogenic liquids. For more complete information, refer to the appropriate Material Safety Data Sheet (MSDS) available through www.airgas.com, or call Airgas National Technical Support at 1-877-ASG-4-GAS.

Wear Personal Protective Clothing and Equipment

Face shields are recommended during transfer and handling of cryogenic liquids. If severe spraying or splashing could occur, safety glasses or chemical goggles will provide additional protection. Wear cryo gloves approved for cryogenic use when handling objects that come into contact with cryogenic liquids and vapor. Trousers should be worn on the outside of boots or work shoes. Depending on the application, it may be advisable to wear special clothing.

Boiling and splashing always occur when charging or filling a warm container with cryogenic liquid or when inserting objects into these liquids. Perform these tasks slowly to minimize boiling and splashing. Use tongs to withdraw objects immersed in a cryogenic liquid. Never touch uninsulated pipes or vessels containing cryogenic liquids. Flesh will stick to extremely cold materials. Even nonmetallic materials are dangerous to touch at low temperatures. In addition to the hazards of frostbite or flesh sticking to cold materials, objects that are soft and pliable at room temperature, such as rubber or plastic, become hard and brittle and are broken easily at these extremely low temperatures.

Table 1

Expansion Ratios at 70°F of
Common Cryogenic Fluids (Liquid to Gas*)

Cryogenic Liquid	Expansion Ratio
Argon	1 to 841
Helium	1 to 754
Hydrogen	1 to 848
Nitrogen	1 to 696
Oxygen	1 to 861

*For Example, 1 cubic foot of liquid argon will create
841 cubic feet of gaseous argon at 70°F

Airgas National Technical Support

Call Toll-Free 1-877-ASG-4-GAS (1-877-274-4427) for expert assistance in solving your cryogenic technical questions.

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LAB Series



LAB Series high-performance freezers incorporate durable, lightweight construction for maximum holding times and optimum capacities. The all stainless steel design assures -180°C vapor storage for large vial capacities up to 80K in box-type racks.

- ! Near liquid nitrogen temperature at the top of the rack
- ! Aluminum turntable is easy to grip
- ! Turntable pivots for easier movement and access
- ! Designed for efficient, maximized inventory
- ! Holds 100-cell and 25-cell racks
- ! Hinged, lockable lid has a hard polycarbonate boot
- ! Flat tabletop provides a convenient work surface
- ! Integrated step folds out of the way when not in use



LAB Series

Models		20K	40K	80K
Dimensions				
External Operating Height - in. (Top of Step to Lid Opening) - mm.		42.5 1080	42.5 1080	42.5 1080
Step Height - in. - mm.		11.0 279	11.0 279	11.0 279
Overall Height - in. (Top of Control Interface) - mm.		60.0 1524	60.0 1524	60.0 1524
Usable Height Internal - in. - mm.		30.0 762	30.0 762	30.0 762
Outside Diameter - in. - mm.		34.0 863.6	45.0 1143	59.5 1511
Internal Working Diameter - in. - mm.		29.5 750	40.5 1029	55.0 1397
Neck Opening - in. - mm.		13.0 330	18.0 457	24.5 622
Capacity				
Liquid Nitrogen Capacity L		407	606	1350
Power Supply ⁽¹⁾ VAC		16.5	16.5	16.5
Evaporation Rate ⁽²⁾ L/day		8.0	9.0	15.0
Weight, Empty - lb. - kg.		650 295	920 417	1550 703
Maximum Gross Weight - lb. - kg.		1375 624	2000 907	3956 1794

(1) This is the power supply for the standard battery backup version. The Kryos version (No Battery) uses a 24 VAC power supply.

(2) Evaporation rate is nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.

Inventory Control Systems

LABS Series Model	System Description	System Vial Capacity	Product Number
20K	20K-13-2-81-C	16042	CS2001
	20K-13-2-100-SS	19500	CS2002
40K	40K-13-2-81-C	34190	CS4001
	40K-13-2-100-SS	41600	CS4002
80K	80K-13-2-81-C	64974	CS8001
	80K-13-2-100-SS	79300	CS8002

NOTE: System Vial Capacity based on 1/2!divider opening!81 and 25 cells for cardboard boxes and dividers!100 and 25 cells for stainless steel boxes with cardboard dividers!100, 81 and 25 cells for plastic boxes.

Storage cell boxes are available in cardboard, plastic, and stainless steel. Custom-design systems and blood inventory systems are also available – call for details.

NOTE: All sales are final. Consult your Airgas representative and confirm specifications.

K Series



K Series cryogenic systems provide reliable liquid nitrogen storage with controllable temperatures between -100°C and -196°C . The added safety of automatic filling, alarms, easy access to stored product, and the unique Temperature Gradient Suppression System significantly improves vapor phase storage temperature and recovery.

- ! Temperature control standard
- ! Temperature monitor standard
- ! Intuitive electronic touch pad for easy programming
- ! Stainless steel vacuum vessel provides consistent temperature control
- ! Modular design
- ! Durable powder-coated cabinet stands the test of time
- ! Casters help you easily position the freezer
- ! Designed to provide superior vacuum performance



K Series

Models		3K	10K	24K	38K
Static Holding Time days ⁽¹⁾		19	33	52	74
Working Time Days ⁽²⁾		12	N/A	N/A	N/A
Evaporation Rate ⁽¹⁾ liters/days		2.5	5.0	7.0	8.0
Liquid Nitrogen Capacity ⁽³⁾ liters		48	165 ⁽³⁾	365 ⁽³⁾	590 ⁽³⁾
Weight Empty	-lbs.	42.0	245	405	565
	-kg.	19.1	111	184	256
Weight Full	-lbs.	125	537	1046	1616
	-kg.	56.7	243	474	733
Neck Diameter	in.	14.0	21.0	31.0	39.0
	- mm.	356	533	787	991
Overall Height	in.	29.7	44.0	44.0	49.0
	- mm.	754	1118	1118	1245
Overall Diameter	in.	15.4	23.1x30.5 ⁽⁴⁾	34.0x38.5 ⁽⁴⁾	42.0 ⁽⁶⁾
	- mm.	391	587x775	864x965	1067
Usable Height - Internal	in.	19.2	29.0	29.0	29.0
	- mm.	488	737	737	737
Internal Diameter	in.	14.0	21.0 ⁽⁵⁾	31.0 ⁽⁵⁾	39.0 ⁽⁵⁾
	- mm.	356	533	787	991
Roller Base		Call for details.	N/A	N/A	N/A
Cryo-Sentry Level Alarm		Call for details.	N/A	N/A	N/A

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.
 (2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions. (3) Liquid Nitrogen Capacity based on liquid full in container up to 2.0 in. (51mm) below booted lid. (4) Maximum required clearance (with lid open) for the 10Ks 69.0 (1753mm); 24Ks 76.0 in (1930mm). Depth with lid open for 10Ks 34.0 (864 mm); 24Ks 48.5 (1232 MM.) (5) Temperature Gradient Suppression System reduces internal diameter by approx. 1 1/4 in. (6.4 mm) (6) Maximum depth 55.0 in. (1397 mm). Maximum height 90.0 in. (2286 mm) with lid open.

Inventory Control Systems

K Series Model	System Description	System Vial Capacity	Product Number	Weight (lbs.)
3K	3K-9-2-C	3024	CS0301	33
	3K-9-2-SS	3024	CS0302	49
	3K-6-3-C	2016	CS0303	32
	3K-6-3-SS	2016	CS0304	47
10K	10K-13-2-81-C	8671	CS1001	87
	10K-13-2-100-SS	10400	CS1002	165
	10K-9-3-81-C	6003	CS1004	85
	10K-9-3-100-SS	7200	CS1005	162
24K	24K-13-2-81-C	19581	CS2401	188
	24K-13-2-100-SS	24050	CS2402	220
	24K-9-3-81-C	13743	CS2404	186
	24K-9-3-100-SS	16650	CS2405	216
38K	38K-13-2-81-C	31434	CS3801	241
	38K-9-3-81-C	21762	CS3802	238
	38K-13-2-100-SS	38350	CS3804	353
	38K-9-3-100-SS	26550	CS3805	340

NOTE: System Vial Capacity based on 1/2" divider opening! 81 and 25 cells for cardboard boxes and dividers! 100 and 25 cells for stainless steel boxes with cardboard dividers.

Special systems for bulk canes storage, as well as for blood and bone marrow canisters and frame storage are also available – call for details.

NOTE: All sales are final. Consult your Airgas representative and confirm specifications.

Aluminum Inventory Control Systems

K Series Model	System Description	System Vial Capacity	Product Number	Weight (lbs.)
10K	10K-13-2A-81-C	8671	CS1006	53
	10K-13-2A-100-A	10400	CS1007	67
24K	24K-13-A2-81-C	19581	CS2406	116
	24K-13-2A-100-A	24050	CS2407	149
38K	38K-13-2A-81-C	31434	CS3806	154
	38K-13-2A-100-A	38350	CS3807	185

NOTE: System Vial Capacity based on 1/2" divider opening! 81 and 25 cells for cardboard boxes and dividers! 100 and 25 cells for aluminum boxes with cardboard dividers! 100-cell aluminum boxes come with an attached lid. 3! boxes are cardboard only.

NOTE: All sales are final. Consult your Airgas representative and confirm specifications.



LS Series



The LS Series (Laboratory Systems) is uniquely designed for large vial capacity in convenient box-type storage racks. These refrigerators provide maximum holding times, which means lower operating costs per vial and fewer refills. The LS6000 with the Auto Tend Controller provides automatic filling and alarm features.

! Roller bases are available for easy mobility
! The LS6000 is available with the Auto Tend Controller for added peace of mind

- ! Built to last with ribbed, high-strength aluminum body, magniformed neck tube design, and durable paint
- ! Designed for convenient storage with rack index location ring and internal spider
- ! Computer-compatible box storage is perfect for simple inventory management
- ! Superior vacuum performance and super insulation provide maximum holding times
- ! Lid can be locked to protect samples
- ! For added security, a low-level alarm is available with remote monitoring capabilities



LS Series

Models		LS750	LS3000	LS4800	LS6000
Static Holding Time day ⁽¹⁾		130	106	153	194
Working Time Days ⁽²⁾		80	66	96	120
Evaporation Rate ⁽¹⁾ liters/days		0.27	0.76	0.85	0.84
Liquid Nitrogen Capacity ⁽¹⁾ liters		35	81	130	165
Weight Empty	-lbs.	39	70	90	121
	- kg.	17.7	31.8	40.9	55.0
Weight Full ⁽³⁾	-lbs.	101.3	214.2	312.4	410.0
	- kg.	46.0	97.4	146.1	186.4
Neck Diameter	in.	4.7	8.5	8.5	8.5
	- mm.	119	216	216	216
Overall Height	in.	26.8	28.8	35.1	39.0
	- mm.	681	731	892	991
Overall Diameter	in.	18.8	26.9	26.9	26.9
	- mm.	478	683	683	683
2ml vial capacity ⁽⁴⁾		750 (5)	3000 (5)	4800 (6)	6000 (7)
Box Size - Shape		Square	Square	Square	Square
Size in.		3.0 x 3.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
Size mm.		76 x 76	127 x 127	127 x 127	127 x 127
Vials per box		25	100	100	100
Roller Base		Available	Available	Available	Available
Cryo-Sentry Level Alarm		Available	Available	Available	Available
AutoTend Controller Kit		N/A	N/A	N/A	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history and manufacturing tolerances.
 (2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.
 (3) Without canisters or racks.
 (4) 2.0 ml vial size: 12.5 mm O.D. internal thread.
 (5) 6-5-2
 (6) 6-8-2
 (7) 6-10-2



NOTE: Inventory Control Systems are included with LS Series refrigerators.

XT Series



The XT (Extended Time) Series of cryogenic refrigerators is designed for storing a wide variety of materials at cryogenic temperatures for the long term. The XT Series offers a low-profile XTL model with 5!canisters.

- ! Rugged construction – ribbed, high-strength aluminum body, magniformed neck tube design, and durable paint
- ! Designed for versatility with convenient canister index location ring and internal spider
- ! Maximum holding times are assured with superior vacuum performance and super insulation
- ! Lockable lid protects samples
- ! A low-level alarm is available with remote monitoring capabilities for added security
- ! Roller bases are available for easy mobility

Models		XTL3	XTL8	XT10	XT20	XT34
Static Holding day\$1)		27	80	100	230	340
Working Time day\$2)		17	50	62	140	212
Evaporation Rate\$1) liters/days		0.11	0.10	0.10	0.09	0.10
Liquid Nitrogen Capacityliters		3	8	10	20.7	34
Weight Empty	lbs.	7.2	19.6	16.5	26	34.75
	-kg.	3.3	8.9	7.5	11.8	15.8
Weight Full\$3)	-lbs.	12.5	33.8	34.3	62.8	95.3
	-kg.	5.7	15.4	15.6	28.6	43.3
Neck Diameter	-in.	2.0	2.0	2.0	2.0	2.0
	-mm.	51	51	51	51	51
Overall Height	in.	17.2	19	23.8	25.8	26.3
	-mm.	437	483	597	655	668
Overall Diameterin.	7.6	15.6	11.4	15.6	18.8	
	-mm.	193	396	290	396	478
Number of Canisters		6	6	6	6	6
Canister Dimension\$4)	-in.	1.5x5	1.5x5	1.5x11	1.5x11	1.5x11
	-mm.	38x127	38x127	38x279	38x279	38x279
Number of 1.2 ml & 2.0 ml vials (5/cane)		N/A	N/A	150	150	150
Number of 1.2 ml & 2.0 ml vials (6/cane)		N/A	N/A	180	180	180
Number of 1/2 cc straws (10/cane)		N/A	N/A	540	540	540
Number of 1.2 cc straws - Bulk (1 level)		750	750	750	750	750
Number of 1/2 cc straws - Bulk (2 levels)		N/A	N/A	1500	1500	1500
Roller Base		N/A	Available	N/A	Available	Available
Low-Level Alarm		N/A	N/A	N/A	Available	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.

(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.

(3) Without canisters

(4) Canisters also available in 5.0 in. (127 mm) height for 10X, 20X and 34X

NOTE: Inventory Control Systems are included with LS Series refrigerators.

C Series



The high-capacity HC Series refrigerators store large quantities of a variety of samples at cryogenic temperatures. These refrigerators are designed for storing at temperatures ranging between -196°C (320°F) at the liquid surface and -190°C (-310°F) at the canister top

- ! Designed for high capacity storage
- ! Ribbed, high-strength aluminum body, magniformed neck tube design, and durable paint help these refrigerators last
- ! Provides versatile storage with convenient canister index location ring and internal spider
- ! Maximum holding times are assured with superior vacuum performance and super insulation
- ! A low-level alarm is available with remote monitoring capabilities for added security
- ! Roller bases are available for some models

Models		CL 12	C20	C34	C35	VC35
Static Holding day ⁽¹⁾		60	87	200	130	130
Working Time days ⁽²⁾		37	54	125	81	81
Evaporation Rate ⁽¹⁾ liters/days		0.20	0.23	0.17	0.27	0.27
Liquid Nitrogen Capacity liters		12	20	34	35	35
Weight Empty	lbs.	21.6	26.4	35.38	39	37.9
	-kg.	9.8	12.0	16.1	17.7	17.2
Weight Full ⁽³⁾	-lbs.	43.0	62.0	95.9	101.3	100.2
	-kg.	19.5	28.2	43.6	46.0	45.5
Neck Diameter	-in.	3.6	3.6	3.6	4.7	4.7
	-mm.	91	91	91	119	119
Overall Height	-in.	19.0	24.25	26.31	26.8	26.8
	-mm.	482	615	668	681	681
Overall Diameter	-in.	15.6	15.6	18.8	18.8	18.8
	-mm.	396	396	478	478	478
Number of Canisters		6	6	6	10	6 (4)
Canister Dimensions	in.	2.75x5	2.75x11	2.75x11	2.64x11	3.7x11
	-mm.	70x127	70x279	70x279	67x279	94x279
Number of 1.2 ml & 2.0 ml vials (5/cane)		N/A	570	570	850	850
Number of 1.2 ml & 2.0 ml vials (6/cane)		N/A	684	684	1020	1260
Number of 1/2 cc straws (10 per cane)		N/A	1850	1850	2800	3000
Number of 1.2 cc straws - Bulk (1 level)		2940	2940	2940	4900	4950
Number of 1/2 cc straws - Bulk (2 levels)		N/A	5880	5880	9800	9900
Roller Base		Available	Available	Available	Available	Available
Cryo-Sentry Level Alarm		N/A	Available	Available	Available	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.

(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.

(3) Without canisters or racks.

(4) Optional 7th canister available to increase storage capacity by 23%

LD Series

The LD Series cryogenic dewars are perfect for storing and dispensing small amounts of liquid nitrogen. The LD Series includes a beaker-style dewar with a wide mouth (LD5) and a pitcher-style model (LD4) for easy pouring.

- ! State-of-the-art construction and advanced insulation materials for high thermal efficiency
- ! Ribbed, high-strength aluminum body, magni-formed neck tube design, and durable paint make these dewars rugged
- ! Easy to operate – light-weight, snap-on cap and precise-fitting neck tube assure tight closure and easy access
- ! Large, convenient handles for easy maneuvering
- ! Superior vacuum and insulation performance for maximum holding times
- ! Optional equipment includes a liquid withdrawal device, tipping stand, dippers, and roller bases for some models – call for details



Models		LD4	LD5	LD10	LD25	Classic 25	LD35	LD50
Static Holding day ⁽¹⁾		10	6	45	109	119	152	122
Working Time day ⁽²⁾		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Evaporation Rate ⁽¹⁾ liters/days		0.40	0.77	0.22	0.23	0.21	0.23	0.41
Liquid Nitrogen Capacity liters		4	5	10	25	25	35	50
Weight Empty	lbs.	6.6	6.9	14.5	23.2	19	35.1	38.7
	-kg.	3.0	3.1	6.6	10.5	8.6	16.0	17.6
Weight Full	lbs.	13.7	15.8	32.3	67.7	63.5	97.4	127.7
	-kg.	6.2	7.2	14.7	30.8	28.9	44.3	58.0
Neck Diameter	in.	1.2	5.6	2.0	2.5	2.0	2.5	2.5
	-mm.	30	142	51	64	51	64	64
Overall Height	-in.	17.0	17.5	23.5	25.8	22.9	26.3	32.4
	-mm.	432	445	597	655	582	668	823
Overall Diameter	in.	7.6	7.6	11.4	15.6	15.5	18.8	18.8
	-mm.	193	193	290	396	394	475	475
Liquid Withdrawal Device P/N		N/A	N/A	N/A	Available	N/A	Available	Available
Roller Base P/N		N/A	N/A	N/A	Available	Available	Available	Available
Tipping Stand P/N		N/A	N/A	N/A	Available	Available	N/A	N/A
Dipper P/N		N/A	Available	Available	Available	Available	Available	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.

(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.



CX and CX!Series Shippers

The CX Series is designed especially for the safe transport of your valuable samples at cryogenic temperatures. The unique absorbent material prevents a liquid spill if the unit is tipped over. Sample storage temperature inside the shipping cavity remains at approximately -190°C until the liquid nitrogen evaporates from the absorbent material.

- ! Designed with Advanced Concept Absorbent for faster charging
- ! Complies with IATA regulations
- ! Durable construction with strong neck design, ribbed high-strength aluminum body and top-quality, long-lasting paint finish
- ! Maximum holding times are assured with superior vacuum performance and super insulation
- ! A temperature logger is available for shipments
- ! Lids lock to protect contents
- ! Models for shipping infectious materials comply with IATA 602 and 650 regulations – call for details



Models		CX100	CX500	CX100	CX500
Static Holding day ⁽¹⁾		30	14	15	14
Working Time day ⁽²⁾		21	7	11	7
Evaporation Rate ⁽¹⁾ liters/days		0.18	0.60	0.25	0.60
Liquid Nitrogen Absorbed liters		4.4	6.4	3.6	7.7
Weight Empty	lbs.	11.7	30	11.7	30
	-kg.	5.3	13.6	5.3	13.6
Weight Full ⁽³⁾	-lbs.	19.5	41.4	19.5	41.4
	-kg.	8.9	18.8	8.9	18.8
Neck Diameter	in.	2.78	8.5	3.58	8.5
	-mm.	71	216	91	216
Overall Height	in.	18.4	26.9	19.4	26.9
	-mm.	467	683	493	683
Overall Diameter	in.	9.2	15.5	9.2	15.5
	-mm.	234	391	234	391
Number of Canisters	1	N/A	N/A	N/A	
Canister Dimension ⁽⁴⁾	-mm.	2.64x11 67.279	N/A	N/A	N/A
Number of 1.2 ml & 2.0 ml vials (5/cane) (4)		85	500	TBD	600
Number of 1.2 ml & 2.0 ml vials (6/cane) (4)		102	500	TBD	600
Number of 1/4 cc straws - Bulk (2 levels)		1820	N/A	TBD	N/A
Number of 1/2 straws - (10/cane)		280	N/A	TBD	N/A
Number of 1.2 cc straws - Bulk (1 level)		490	N/A	N/A	N/A
Shipping Case P/N		CX10-8C00	CP19-8C00	C10-8C00	CP19-8C00
Padded Carton		3701-9277	N/A	3701-977	N/A
5 shelf rack		N/A	RS30-9C44	N/A	RS30-9C44
Poly Carb 100 box		N/A	R24K-9C44	N/A	R24K-9C44

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.

(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.

(3) Without canisters or racks.

(4) C100 vials are stored in 100 cell boxes.

Racks for D!

Description: These mounting racks are designed to safely secure up to four gas cylinders, two in front, two in back, as well as one of our Changeover Panels. Racks feature unobstructed front and rear entry. Shipped in three boxes!some assembly is required. Assembly time is 15–30 minutes with standard tools.

CHANGEOVER PANELS

Accessories



Ordering Information

Product Number	Description	Dimensions	Owner Supply
Y99-4CYLRACK	4- Cylinder Floor Rack	27.75!W x 72!H x 20!D	White Powder Coat Epoxy
Y99-2DEWARRACK!	2- Cylinder Floor Rack	14!W x 65.5!H x 18!D	Aluminum

Designed for Liquid Cylinder Gas Phase Changeover Panels

Pulsar™ and Pulsar™ ! Single-Gas Detectors

Uniquely design Pulsar Single-Gas Detectors from MSA provide maintenance-free, 24-month gas monitoring with a battery that for 33!more capacity than the competition. They require no field calibration nor battery or sensor replacement. Large character numeric displays accurately count down service life. Units are IP54 rated virtually impervious to water and dust ingress, and are designed to survive a 6-foot drop. They attach during even the roughest use with standard spring and suspension attachment clips. Choose a Pulsar™ Detector with audio and visual alarms for CO, H₂S or O₂, or a triple alarm unit with added vibrating alarm for O₂

With the same rugged durability, easy-to-use Pulsar Single-Gas Detectors from MSA feature a gas concentration display and replaceable sensor and battery. Replacing the patented, leakproof stainless steel Button Sensors is easy, and the replaceable long-life lithium battery extends the working life of the unit. Choose best-in-class alarm systems with piercing audio, ultra-bright quadruple visual and optional vibrating alarms. Lifetime warranty.

Pulsar™

Product Number	Description
MSA 10032580	A-PULSAR-1-A CO Alarm
MSA 10032592	A-PULSAR-3-N H ₂ S Alarm
MSA 10032594	A-PULSAR-5-X O ₂ Alarm
MSA 10032595	A-PULSAR-6-X O ₂ Alarm with vibrating Alarm

Pulsar™ !

Product Number	Description
MSA 10036171	Pulsar™ + CO Alarm
MSA 10036174	Pulsar™ + CO with Vibrating Alarm
MSA 10036172	Pulsar™ + H ₂ S Alarm
MSA 10036175	Pulsar™ + H ₂ S with Vibrating Alarm
MSA 10036172	Pulsar™ + O ₂ Alarm
MSA 10036175	Pulsar™ + O ₂ with Vibrating Alarm



Liquid Cylinder Gas Phase Models

Special Service

CHANGEOVER PANELS

Description: This Airgas® high-purity automatic changeover panel provides continuous, uninterrupted gas supply on installations where a reserve liquid cylinder is used. The unit consists of two identical regulators, one delivering gas at a slightly higher pressure than its twin. When the service cylinder is empty, the unit will automatically withdraw gas from the reserve cylinder, thus eliminating the need to shut down the system to replace empty cylinders. The pressure gauges immediately indicate which cylinder is in use.

Gas saver feature: On models as indicated in ordering information insert, an integral gas saver circuit has been incorporated into the manifold to prevent the reserve cylinders accumulated head gas pressure from being wastefully discharged to atmosphere. During operation, the gas saver directs reserve cylinder pressure buildup to the primary bank where it is used. During shutdown periods, both banks may vent to atmosphere. Adequate ventilation must be provided to remove or disperse these gas discharges safely.

Notes:

Alarm systems to indicate that cylinder changeover has occurred can be factory installed at an additional cost.



Design Features

Gas Saver Circuit on Certain Models

pays back cost of unit through gas savings.

Automatic Changeover

provides uninterrupted high-purity gas supply.

Control Knob

permits safe removal of the empty cylinder while another cylinder is in use.

Convuluted Stainless Steel Diaphragms

provide superior leak integrity without contamination from non-metallic liner or seal.

Diaphragm Packless Isolation Valves

allow for positive shut-off during cylinder change out.

Diaphragm Packless Purge Valves

allow for purging pigtails eliminating atmospheric contaminants.

Built-In Line Regulator

provides ranged delivery pressure of 10–150 psig.

Extended Length Pigtails

6 foot stainless steel corrugated bellows w/check valves.

Specifications	
Maximum Rated Inlet Pressure	400 psig
Outlet Pressure Ranges	10–150 psig (adjustable)*
Maximum Flow Rate	200 scfh @ 150 psig
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Range	Bubble-Tight (helium)
Weight	11 lbs
Outlet	1/4" Compression Fitting
Pigtails	72" Corrugated Bellows, 316 Stainless Steel Flex

Materials	
Body	Nickel-Plated Brass or 316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316L Stainless Steel
Inlet Gauge	1 1/2" Nickel-Plated Brass or Stainless Steel
Outlet Gauge	2" Nickel-Plated Brass or Stainless Steel
Filter (40-micron)	Stainless Steel Screen

To achieve a delivery pressure of 150 psig, the liquid cylinder pressure build circuit must be set to at least 200 psig or be connected to a 300 psig liquid cylinder. A cylinder with the pressure build circuit set between 100–175 psig will deliver only 75–125 psig.

Ordering Information						
Product Number	Material	No. Cyl.	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
*Y11-CP120LP(CGA)	Brass	2	150	200	0–400	0–200
**Y11-CP120RLP(CGA)	Brass	2	150	200	0–400	0–200
*Y11-CP140LP(CGA)	Brass	4	150	200	0–400	0–200
*Y11-CP160LP(CGA)	Brass	6	150	200	0–400	0–200
*Y11-CP420LP(CGA)	316 SS	2	150	200	0–400	0–200
*Y11-CP440LP(CGA)	316 SS	4	150	200	0–400	0–200

*Gas saver circuit

** No gas saver circuit

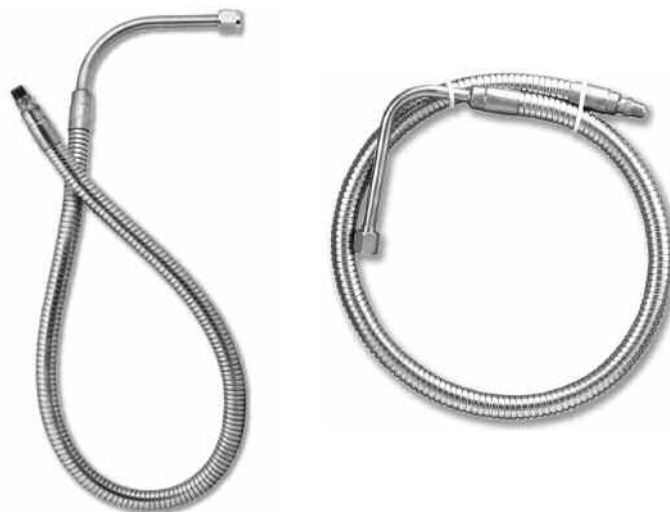
Available Options	
Product Number	Description
Y78-200ALPK	Non-Flammable Alarm Package

Transfer hoses and Phase Separator

Description: These cryogenic transfer hoses are available in 4-foot and 6-foot lengths. They feature a stainless steel anti-kink armor casing. The CGA end features a 90-degree bend for ease in connecting to liquid cylinders. Hoses are CGA 295 3/8" MNPT for helium, nitrogen, and argon, and CGA 440 x 440 for oxygen. Matching phase separators may be purchased at an additional cost.

CRYOGENIC ACCESSORIES

Transfer Hoses



Design Features

Ultimate Flexibility

makes connection easy; coil up for storage.

Full Armor Casing

protects hose from abrasion — very flexible, no broken wires.

Machined End Connections

machined from bar stock, not from tubing — eliminate distortion, cracking, leaks.

Stainless Steel Fitting

will not wear like brass.

Quality Design

protects flare end from damage.

Stainless Steel Construction

provides long life, faster cool-down, durability.

Low Profile Corrugations

ensure faster filling, lower pressure drop, and less product loss.

Hoses for Oxygen

are provided cleaned, capped and bagged for oxygen service.

Ordering Information

Product Number	Description	Length (ft)	Gas Service
Y15-4CH429538	CGA 295 x 3/8" MNPT	4	Nitrogen, Argon, Helium
Y15-4CH629538	CGA 295 x 3/8" MNPT	6	Nitrogen, Argon, Helium
Y15-4CH4440	CGA 440 x CGA 440	4	Oxygen
Y15-4CH6440	CGA 440 x CGA 440	6	Oxygen

CRYOGENIC ACCESSORIES

Phase Separator

Available Options

Product Number	Description	Service
Y15-PSB38	Phase Separator Bronze, 3/8" FNPT x 3" length	Nitrogen, Argon, Helium



Liquid Cylinder Liquid Phase Models

Description: This microcontroller-driven system monitors manifold pressure and the presence or absence of liquid nitrogen in the manifold. Each supply tank connects to the manifold through a 24-volt AC solenoid valve. Each supply tank's solenoid valve is energized only when liquid needs to be delivered to the freezers. Through a series of timed solenoid on/off periods, manifold pressure and liquid nitrogen presence in the manifold confirm either the viability of the supply or that a switchover to the other supply tank is needed. A switchover to the alternate supply tank is made when the manifold pressure remains low and no liquid is ever detected.

CHANGEOVER PANELS

Nitrogen Service

Design Features

Automatic Changeover

between individual or liquid cylinder banks.

Micro-controller Design

for system flexibility.

Multiple Solenoid Valves

2 to 8 solenoid valves.

Monitors

pressure and the flow of liquid nitrogen.

Voltage Requirements

low voltage – 24VAC.

Alarms

visual alarm indicates when a supply cylinder is empty; audible alarm when all cylinders are empty; relay for remote alarm connection when all cylinders are empty.

Specifications

Maximum Rated Inlet Pressure	40 psig
Outlet Pressure Ranges	0-22 psig
Maximum Flow Rate	1 liter/minute
Ambient Operating Temperature	32° F to 125° F
Weight	30 lbs.
Inlet/Outlet	1/4" Flare, CGA295
Liquid Detection	Thermistor
Relief Valve	22 psi

Materials

Valves	Brass
Piping	Brass/Stainless Steel
Mounting Brackets	Painted or Galvanized Steel
Wall Mount Panels	High Density Polyethylene, 1/2" thick

Electrical

Transformer	120VAC/24VAC, 40VA
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Ordering Information

Product Number	Description/Material
Y40-TSSA2	Universal Tank Switcher 2 solenoid valves
Y40-TSSA()	Universal Tank Switcher 1 solenoid valves

(where () specifies 2 to 8 valves)

Cylinder Carts and Trucks

Description: Our cylinder carts and trucks are designed for transporting compressed gas cylinders as well as dewars and liquid containers.

Model 99-231100 is designed for safely transporting single cylinders.

Model 99-231200 is designed for transporting single cylinders and features retractable rear wheels for added safety and maneuverability.

Model 99-231300 is designed to transport two cylinders and features heavy-duty construction, rigid rear carriage supports and high load capacity.

Model 99-231400 is designed for transporting single cylinders up to 20" in diameter. A heavy-gauge toeplate ensures positive placement of the cylinder, reducing the occurrence of dropped cylinders.

Model 99-231500 is a patented liquid gas transport system developed for safer handling of cryogenic cylinders up to 1,000 lbs gross weight. Simply align the hook assembly directly in front of the cylinder eyelet hole and turn the handle until the desired height is reached. The patented mechanical lift mechanism allows virtually anyone to safely and easily lift and move a dewar container.

Model 93-NMCAIT is designed for use in MRI applications. Constructed of durable, non-magnetic materials.

MISCELLANEOUS EQUIPMENT

Accessories



Y99-231100



Y99-231200



Y99-231400



Y99-231500

Ordering Information

Product Number	Cylinder Sizes Supported
Y99-231100	300, 200
Y99-231200	300, 200
Y99-231300	300, 200, 3HP, 2HP
Y99-231400	Cryogenic Containers
Y99-231500	Cryogenic Containers
Y93-NMRCART	300, 200

Cylinder Floor Savers

Description: These floor savers were designed to protect and preserve tile, wood, carpeted and painted floors from bacteria, rust, corrosion and condensation caused by industrial and medical gas cylinders and liquid dewars. They are ideal for biotech, pharmaceutical, medical and electronic work areas.

The floor savers are constructed of a custom-blended, chemical-resistant, high-impact thermoplastic crafted to eliminate the need to routinely clean and buff floors around cylinders and dewars.

Floor savers, with their moisture collection reservoir, provide a protective barrier between the cylinders and the floor. They prevent transfer of cylinder or dewar contamination and moisture to the work area, providing a safer work environment.

Cleaning solvents, moisture and water will not adversely affect the integrity of the floor saver

MISCELLANEOUS EQUIPMENT

Accessories



Ordering Information

Product Number	Specification	Cylinder Sizes Supported
Y99-LT10	<ul style="list-style-type: none"> ! Overall Size – 11¹/₄! x 11¹/₄! ! Reservoir – 10!diameter x³/₈! ! Capacity – 1 pint ! Weight – approximately 1 lb ! Color – tan 	10" Diameter or Smaller
Y99-LT22	<ul style="list-style-type: none"> ! Overall Size – 23¹/₂! x 23¹/₂! ! Reservoir – 22!diameter x⁵/₈! ! Capacity – 4 quarts ! Weight – approximately 6 lbs ! Color – tan 	Dewars 22" or Smaller
Y99-LT33	<ul style="list-style-type: none"> ! Overall Size – 32!x 33! ! Reservoir – 30!x 30!x ³/₄! ! Capacity – 5 quarts ! Weight – approximately 9 lbs ! Color – tan 	230L Dewars w/Caster Base

Cylinder Scales !Dial Models

Description: The pressure and temperature of a liquefied gas remains constant as material is withdrawn, as long as a liquid phase remains in the cylinder. Once the liquid phase is exhausted, the pressure drops rapidly and the cylinder empties. This characteristic renders a cylinder pressure gauge virtually useless as a means of estimating the time to total supply depletion. One way to monitor the contents of a cylinder containing a liquefied gas is by weight.

The Model 280 cylinder scale is designed to give a positive indication of the amount of product remaining in the cylinder. Simply subtract the tare weight of the cylinder so that the net contents can be read directly. The optional non-skid ramp makes loading and unloading cylinders convenient, quick, and easy.

These scales are recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane, and heavier hydrocarbon gases.

MISCELLANEOUS EQUIPMENT

Cylinder Scales



Specifications

Tare Weight Range	0-140 lbs
Net Weight Range	0-140 lbs
Total Weight Capacity	280 lbs (5-lb increments)
Readability	1 lb By Estimation
Dimensions (WxHxD)	10 1/4" x 10 1/4" x 2 1/2"

Ordering Information

Product Number	Description
Y40-280	Scale with Dial Readout
Y40-280R	Optional Ramp for Y40-280

Cylinder Scales !Digital Models

Description: The pressure and temperature of a liquefied gas remains constant as material is withdrawn, as long as a liquid phase remains in the cylinder. Once the liquid phase is exhausted, the pressure drops rapidly and the cylinder empties. This characteristic renders a cylinder pressure gauge virtually useless as a means of estimating the time to total supply depletion. One way to monitor the contents of a cylinder containing a liquefied gas is by weight.

The Model 280 cylinder scale is designed to give a positive indication of the amount of product remaining in the cylinder. Simply subtract the tare weight of the cylinder so that the net contents can be read directly. The optional non-skid ramp makes loading and unloading cylinders convenient, quick, and easy.

MISCELLANEOUS EQUIPMENT

Cylinder Scales

These scales are recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane, and heavier hydrocarbon gases.

Specifications

Tare Weight Range	0-150 lbs
Net Weight Range	0-150 lbs
Total Weight Capacity	0-300 lbs
Alarm Set Point	0-150 lbs
Accuracy	0.5% of Full Scale
Control Box Dimensions (WxHxD)	Control Box - 8 1/2" x 2.6 1/2" x 1 1/4"
Platform Dimensions (WxHxD)	Model 300 - 15 3/4" x 17 1/2" x 1 1/4" Model 301 - 20 1/2" x 20 1/2" x 1 1/4"

Ordering Information

Product Number	Description
Y40-300	Scale with readout w/ 15 3/4" x 17 1/2" platform
Y40-301	Scale with readout w/ 20 1/2" x 20 1/2" platform

Cryogenic loves !Aprons

A. NSA Cryogen Safety loves

Designed to withstand the ultra-low temperatures encountered when working with cryogenics or in other extremely cold environments, NSA's gloves for cryogen safety are water resistant and can also be used to handle dry ice.

NOTE: Not for immersion in cryogenic liquids.
Sold per pair.



Part Number	Description	Size
N33 G99CRBEWRMDR	Cryogen Wrist Length 12!	Medium
N33 G99CRBEWRLGR	Cryogen Wrist Length 12!	Large
N33 G99CRBEWRXLR	Cryogen Wrist Length 12!	XLarge
N33 G99CRBEMAMDR	Cryogen Mid-Arm Length 14!15!	Medium
N33 G99CRBEMALGR	Cryogen Mid-Arm Length 14!15!	Large
N33 G99CRBEMAXLR	Cryogen Mid-Arm Length 14!15!	XLarge
N33 G99CRBEELMDR	Cryogen Elbow Length 18!19!	Medium
N33 G99CRBEELLGR	Cryogen Elbow Length 18!19!	Large
N33 G99CRBEELXLR	Cryogen Elbow Length 18!19!	XLarge



B. NSA Cryogen Safety Aprons

An inner layer of insulation and an outer water-resistant, yet breathable, laminate work to protect torso and legs from splash and incidental contact with cryogenic liquids. Adjustable at the neck and waist, all of these aprons are 24!wide at their widest point.

NOTE: Not for immersion in cryogenic liquids.
National Safety Apparel is certified to ISO 9001:2000, with design.

Part Number	Description	Size
N33 A02CR24I36IC	Cryogen Apron	36!Length
N33 A02CR24I42IC	Cryogen Apron	42!Length
N33 A02CR24I48IC	Cryogen Apron	48!Length
N33 A02CR24I54IC	Cryogen Apron	54!Length



A. Radnor® Ventilated Safety Goggles

Soft vinyl frame fits snug and can be worn for extended periods of time. Transparent frame allows vision in all directions and has hooded vents that prevent fogging and aids ventilation. Tough polycarbonate lens offers protection against dust and flying particles.

Art Number	Bulk Art Number	Description
64005092	64005093	Clear Polycarbonate Safety Goggles

B. Radnor® Chemical Splash Safety Goggles

Soft vinyl frame that fits snug and can be worn for extended periods of time with comfort. Clear polycarbonate lens and clear frame with indirect ventilation (4 screened vents) allow these goggles to be effective protection against dust, splashes and light impacts.

Art Number	Bulk Art Number	Description
64005094	64005095	Clear Polycarbonate Chemical Splash Safety Goggles

C. Radnor® Replacement Elastic Goggle Band

Exact replacement for goggles listed above.

Art Number	Description
64005098	Elastic Goggle Band (4/pk)

D. Radnor® Polycarbonate Visors

For heavy-duty impact protection, clear Polycarbonate Visors are available in several sizes. Always wear visors with primary eye protection. Meets ANSI 87+ (high impact) Standard. Made in USA.

Art Number	Description
64051052	Visor 8 1/2" x 15.5" x .040" Clear
64051053	Visor 9 1/2" x 15.5" x .040" Clear
64051054	Visor 10 1/2" x 20 1/2" x .040" Clear



E. Radnor® Headgear Faceshield Frame

When no hard hat is required, the Radnor® Headgear Faceshield Frame is a cool, comfortable way to wear a faceshield. It features a ratchet suspension, standard spark guard and adjustability from head sizes 6 1/2 to 8. Visor not included. Meets ANSI 87.1-2003 Standard. Made in USA.

Art Number	Description
64051061	Headgear Faceshield Frame

! SightSense™ by Radnor® 1700 Series Dual Lens Eyewear

From the soft nose pads through the straight spatula temple with length and ratcheting height adjustment, the 1700 Series Dual Lens eyewear is built with comfort in mind. The nylon frame has soft inserts above the ears for a secure fit. The dual lenses wrap around and provide integral side protection and block 100% of harmful UV rays. All of this in a package that weighs less than an ounce. Meets ANSI 87+ Standard.

Art Number	Description	Frame
64051701	Clear	Burnt Orange
64051702	Clear Anti-Fog	Burnt Orange
64051703	I/O Clear	Burnt Orange
64051704	Gray	Burnt Orange
64051705	Mirror	Burnt Orange

! SightSense™ by Radnor® 1300 Series Sport Lens Eyewear

With wrapped temple styling, ergo-grip sleeve and a non-slip nosepiece, the 1300 Series Sport Lens eyewear is attractive and comfortable at the right price. The single lens is retained in the frame by a specially designed channel and blocks 100% of harmful UV rays. Lens features scratch resistant coating for a longer wear life. Meets ANSI 87+ Standard.

Art Number	Description	Lens
64051301	Clear	Black
64051302	Gray	Black
64051303	Mirror	Black
64051315	Amber	Black
64051304	Clear	Blue
64051305	Gray	Blue
64051313	Clear	Crimson
64051311	I/O Clear	Crimson
64051312	Mirror	Crimson
64051314	Anti-Fog	Crimson






Nitrogen (N_2) *A colorless, odorless, nonflammable cryogenic liquid.*

Airgas offers liquid Nitrogen for all your cryogenic needs. We provide various sizes and volumes, including vented 160-, 180- and 240-liter dewars, as well as MicroBulk and bulk deliveries.

Technical Data / Shipping Information

Molecular Weight	28.01
Specific Volume	13.8 cf/lb @ 70°F
Flammability Limits in Air	Nonflammable
U.S. DOT Name	Nitrogen, Compressed
ID Number	UN 1066
U.S. DOT Hazard Class	2.2
U.S. DOT Label	Nonflammable Gas
CAS Registry	7727-37-9

Airgas provides liquid Nitrogen in liquid cylinders (dewars), MicroBulk, and bulk deliveries. The table below may help you decide which mode of supply is right for your organization based on your monthly usage. If you use more than 5,000 SCF (61 gallons) of liquid Nitrogen per month, you may be a good candidate for our MicroBulk supply mode. If you use in excess of 45,000 SCF (500 gallons) per month, our bulk delivery program may be the most cost-effective solution for you. For more details, contact the Airgas location nearest you by first calling 1-866-924-7427.

	Mode of Supply	SCF	Gallons	Liters
	Liquid Cylinders	4,500 - 5,600	48 - 61	180-230
	MicroBulk	5,000 - 48,000	61-539	230-2,000
	Bulk	45,000	500	1,892

Dry ice from the largest supplier in the U.S.

If you're looking for dry ice, you'll find it with Airgas. Dry ice from Airgas provides ideal low-temperature cooling for shipping specimens and samples. It is also efficiently used in the preservation of tissue samples, to reduce temperatures for microtomy and histology work, and for shell freezing biological samples.



Pellets – 1/8" to 3/4" bulk, bagged, boxed



Blocks – full, half, 10-lb., 5-lb., airline cut

2

CO₂ gas is inert, colorless, odorless and tasteless. It is available as a food-grade product and is transported and stored in both its liquid and solid phases. It is easily and safely liquefied, solidified, handled, and stored. In its solid form, CO₂ is a refrigeration product that can be easily converted from a liquid to dry ice snow or pellets at customer locations. Liquid CO₂ is stored in insulated and mechanically refrigerated tanks. CO₂ is commercially referred to as carbonated water.

Product	Ordering Information					Equipment Recommendations	
	Cylinder Size	Contents lbs	Standard Valve Outlet (CA)	Product Number	Cylinder Pressure at 70°F (psig)	Description Product Number	Delivery Pressure Range (psig)
Carbon Dioxide (CO ₂) Instrument/Coleman coolant	200	60	320	CD 1200S	835	Two-Stage Regulators	A10-25
	80	24	320	CD 180S	835	Y12-N145 I320 Y12-244 I320 Single-Stage Regulators Y11-N145 I320 Y11-244 I320	B10-50 D10-100 E10-150 F10-250 G10-500!
An individual or batch analysis is available upon request at a normal charge. Certificate of Conformance provided upon request. For cooling applications order this product with a dip tube for liquid withdrawal. Add S to end of Product Number.						* Insert Delivery Pressure Range Code ** Single Stage Only	

Service Connector for Life Science Gas Supplies

Description: This unique device allows for uninterrupted gas supplies to critical life science, analytical or other applications when the process must have a continuous gas supply.

The service connector connects the primary gas supply to an emergency gas back up supply and allows for a temporary gas supply to be connected in the event one or both of the other gas supplies fails.

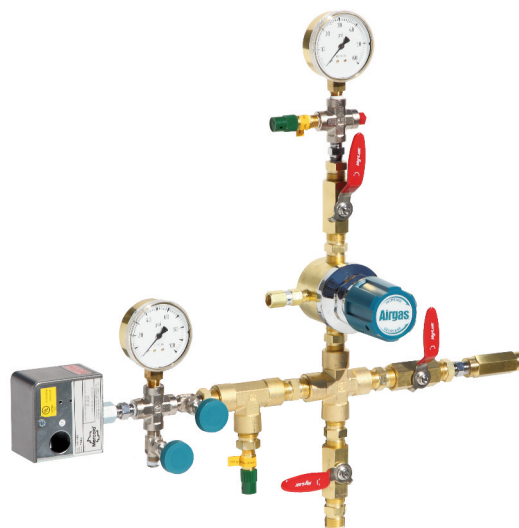
There is a pressure switch that can be interconnected to an Airgas or customer's alarm system that can alarm when the emergency supply activates if the primary gas supply fails.

The maintenance port allows for a temporary gas supply to be connected if either the primary or emergency supply system needs maintenance.

The capability to have multiple as well as temporary supply connected will protect your process, samples, or other critical elements.

Service Connector

LIFE SCIENCE CHANGEOVER MANIFOLDS



Specifications	
Maximum Rated Inlet	1,200 psig
Pressure Ranges	10-100
Flow Capacity	Cv=1.0
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	21 lbs
Inlet	¼" FNPT
Outlet	¼" FNPT
Decay Inlet Characteristic	0.23/100 psi

Materials	
Body	Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauge	2½"
Filter	316 Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Trim	Nickel-Plated Brass

Design Features

- Final line regulator adjusts line pressure from 10 – 100 psig
- Check valves and safety relief valves prevent back flow from one source to another
- Maximum inlet pressure 1200 PSIG
- Manifold outlet - ¼" NPT
- Relief valve outlet - ¼" MNPT
- Pressure switch set point 0 – 200 psi
- Ball valves provide a visual indication of which supply source is active
- Needle valve allows for purging or venting of gas lines.

Optional Parts						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)	Relief Valve Setting (psig)
Y11-LSSC1000	Brass	1,200	100	660	0 - 200	150

Incubator Line Regulator w/Dual Outlets

Incubator Line Regulator

REGULATORS

Description: This line regulator is specifically designed to supply gas to multiple incubators from a single house line. The regulator will control the pressure from the source to the incubators. The ball valves provide positive shut off while giving a visual indication of open or closed.

The regulator comes mounted to a bracket to allow for easy wall mounting. The hose barbs allow for easy installation to the incubators.



Specifications	
Maximum Rated Inlet	1,200 psig
Pressure Ranges	0-25, 0-50, 0-100
Flow Capacity	Cv=0.13
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	2.4 lbs
Inlet	1/4" FNPT
Outlet	1/4" hose barb
Decay Inlet Characteristic	0.23/100 psi

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauge	2 1/2" Nickel-Plated Brass
Filter	316 Stainless Steel
Valve Stem	316 Stainless Steel
Valve Spring	316 Stainless Steel
Trim	Nickel-Plated Brass

Design Features

Regulator

Filtered seat: for added gas stream purity and extended service life.
Stainless steel diaphragm eliminate outgassing associated with elastometric diaphragms.
Bar stock body provides low internal volume.
Encapsulated filtered seat assembly protects valve seat, extend service life.
Nickel-plated brass body provides long-lasting good looks; will not tarnish.
Mounting: regulator is mounted to a wall mount bracket.

Ball valves

Provide positive shut off
Provides visual indication of open or close position
1/4" hose barbs on outlets

Optional Parts						
Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Delivery Gauge Range (psig)	Relief Valve Setting (psig)
Y11-LS721A2B	Brass	1,200	25	275	30" Hg-0-30	85
Y11-LS721B2B	Brass	1,200	50	420	0 - 60	150
Y11-LS721D2B	Brass	1,200	100	660	0 - 200	150

Life Science Switchover Regulator Series

Life Science

CHANGEOVER MANIFOLDS

Description: The Airgas® Life Science Series System is a automatic switchover system designed to supply a continuous supply of high purity, non-corrosive gas. This series is designed for the life science market and the gases used in this market, it does extremely well in CO₂ service. Due to the pressure differential considerations, an integral line regulator is used to maintain constant downstream pressure. The pigtails are flexible stainless steel for easy cylinder connection; the CGA's have integral check valves.

The 6 and 8 cylinder models use our block manifold header as standard.

Note: There are no shut off or purge valves in this system. They may be added as an option, or refer to our High Purity Changeover Panels.



Design Features

Metal-to-metal diaphragm seal

No possibility of gas contamination

User-friendly priority valve

One knob switches cylinder priority

Check valves in CGA nipples

Prevents contamination and back flow

Line regulator

Assures stable line pressure during changeover

Materials

Body	Brass barstock, 316 Stainless Steel
Seat	PTFE
Diaphragm	316L Stainless Steel
Gauges	Brass, 316L Stainless Steel
Filter	10 micron Sintered Bronze or 316L Stainless Steel Mesh
Seals	PTFE (PCTFE for 4500 psig option)

Specifications

Maximum Rated Inlet Pressure	3000 PSIG (4500 PSIG Optional)
Maximum Outlet Pressure	0-50, 0-150, 0-250 PSIG
Flow Capacity	Cv=0.1
Ambient Operating Temperature	-40°F to 140°F (-38°C to 60°C)
Designed Leak Rate	1 x 10 ⁻⁸ scc/sec
Weight	9 lbs.
Ports	1/4" FNPT
Inlet	1/4" FNPT
Outlet	1/4" FNPT
Gauge	2" diameter

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Pressure (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP602B(CGA)	2	Brass	3000	10-50	450	0-4000
Y11-CP604B(CGA)	4	Brass	3000	10-50	450	0-4000
Y11-CP606B(CGA)	6	Brass	3000	10-50	450	0-4000
Y11-CP608B(CGA)	8	Brass	3000	10-50	450	0-4000
Y11-CP642B(CGA)	2	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP644B(CGA)	4	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP646B(CGA)	6	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP648B(CGA)	8	316 Stainless Steel	3000	10-50	450	0-4000
Y11-CP602D(CGA)	2	Brass	3000	10-150	875	0-4000
Y11-CP604D(CGA)	4	Brass	3000	10-150	875	0-4000
Y11-CP606D(CGA)	6	Brass	3000	10-150	875	0-4000

CHANGEOVER MANIFOLDS

Life Science

Life Science Switchover Regulator Series Cont.

Ordering Information

Product Number	Numb. of Cylinders	Material	Max Inlet Press. (psig)	Delivery Press. Range (psig)	Capacity (scfh @ Max Del. Press.)	Inlet Gauge Range (psig)
Y11-CP608D(CGA)	8	Brass	3000	10-150	875	0-4000
Y11-CP642D(CGA)	2	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP644D(CGA)	4	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP646D(CGA)	6	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP648D(CGA)	8	316 Stainless Steel	3000	10-150	875	0-4000
Y11-CP602E(CGA)	2	Brass	3000	10-250	1,100	0-4000
Y11-CP604E(CGA)	4	Brass	3000	10-250	1,100	0-4000
Y11-CP606E(CGA)	6	Brass	3000	10-250	1,100	0-4000
Y11-CP608E(CGA)	8	Brass	3000	10-250	1,100	0-4000
Y11-CP642E(CGA)	2	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP644E(CGA)	4	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP646E(CGA)	6	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP648E(CGA)	8	316 Stainless Steel	3000	10-250	1,100	0-4000
Y11-CP602G(CGA)	2	Brass	3000	10-400		0-4000

Available Options

Product Number	Description
Y99-4CYLRACK	4 Cylinder Rack
Y78-820ALPK*	Non-Flammable Alarm Package

Remote Alarm Capability: Must be ordered at time of original order

Flammable Gas Service Provided with Intrinsic Safety Barriers to ensure safe operation

*Integrated Alarm Systems (pressure switch gauges) available, call 1-800-939-5711.

Cryogenic Freezer Manifold

Liquid Nitrogen Freezer Supply

MANIFOLDS

Description: These manifolds are designed specifically to supply liquid nitrogen to freezers. The manifolds have safety relief valves to prevent the pipe from rupturing if liquid nitrogen becomes entrapped between the shut-off valve and the freezer solenoid valve.

The header is made from ½" XHVY brass pipe. The safety reliefs valves are extended to a height to ensure they do not become encased in ice if the manifold developed an ice coating on the outside.

Some manifolds are complete with cryogenic hoses to connect to the freezer. Please refer to ordering information.

Specifications	
Headers	½" XHvy brass pipe
Safety Relief Valve Setting	75 psig
Inlet	CGA 295 female swivel
Outlet to Freezer	CGA 295 male



Available Options		
Product Number	Description	Connection Hoses to Freezer
Y15-LS1FZ1PT	One N2 Dewar Source x One Freezer Includes 6 ft hose	Yes
Y15-LS1FZ1	One N2 Dewar Source x One Freezer	No
Y15 LS1FZ1PS	One N2 Dewar Source x One Freezer w/(1)Liquid N2 Withdrawal Port CGA 295	Yes
Y15-LS1FZ2DWR	Two N2 Dewar Source x One Freezer	Yes
Y15-LS1FZ2DWR1PS	Two N2 Dewar Source x One Freezer w/(1)Liquid N2 Withdrawal Port CGA 295	Yes
Y15-LS1FZ2DWR	Two N2 Dewar Source x One Freezer	Yes
Y15 LS2FZ1DWR	One Liquid N2 Dewar Source x Two Freezers	Yes
Y15 LS3FZ2DWR	Two Liquid N2 Dewar Source x Three Freezers	Yes
Y15 LS4FZ1DWR	One Liquid N2 Dewar Source x Four Freezers	No
Y15 LS295R	CGA 295 Relief Assembly	N/A
Y15 LSCR250	Cryogenic Relief Valve Assembly with Candy Cane Tubing	N/A
Y15 LSX2V1R	Liquid N2 splitter mini manifold, (2) outlets and relief valve with one inlet CGA 295	No

Solvent Padding & Dispensing System; Smart Indicating Series

Description: The Airgas® Solvent Padding & Dispensing system provides a safe and efficient method for removing solvents from the storage container. This system uses the Airgas two-stage Regulator to provide accurate low pressure (max 25 psig) control while maintaining gas purity by containing and removing contaminants that can enter the solvent container during the padding process. The two cylinder process station model includes a 30" SS flexible pigtail with a block-and-vent assembly incorporated on the inlet, and a check valve CGA 580 nipple. These components prevent mass contaminants from entering the gas stream and contaminating the solvent. The entire assembly comes pre-mounted onto a process station that allows for use of one cylinder and storage of a reserve cylinder. The rack is epoxy powder paint finished, plate steel. As a safety precaution, an integrated relief valve has been added to the outlet of the regulator which will protect the solvent container from possible over-pressurization. On the outlet of the regulator, a 6 ft high purity cleaned, flexible metal hose delivers the low pressure gas to the solvent container. On the end of this flexible hose is a check valve followed by the "GAS INLET" keyed quick-connect. Once connected to the solvent container, the head pressure inside the container can be positively charged to a maximum of 25 psig. The "LIQUID OUTLET" keyed quick-connect has a toggle valve to control the dispensing of the solvent into an approved secondary container. Optional scales are available to assist in accurately recording the total amount of the solvents dispensed.

Solvent

SOLVENT DISPENSING SYSTEMS



Design Features

Safeguards Purity of Padding Gas

- provides protection of your processes from being contaminated by an improper cylinder of a lower grade of gas being connected
- contains and removes contaminants that can enter the solvent container during cylinder change out

Provide Convenient Cylinder Storage

- two cylinder capacity provides room for process and reserve cylinder

Easy Installation and Setup

- Entire system delivered pre-mounted to process panel
- Process Station shipped partial disassembled for freight savings and ease of use

Safety Relief Valve

- protects the system from possible over-pressurization should the regulator fail.

Grounding Straps

- regulator assembly grounded to process station
- additional grounding strap provided
- protects the system from a possible static-electric discharge while dispensing flammables liquids

Flexible Metal Pigtails

- Stainless Steel construction provides excellent diffusion and corrosion resistance
- High convolution count provides excellent flexibility
- Cleaned for O2 Service; allows high purity system integrity

Integral Check Valves

- ensures high purity integrity maintained
- eliminates possible solvent bleed back into cylinder

Solvent Specific Keyed Quick-Connects

- allows for connection to "GAS" inlet and "LIQUID" outlet on solvent containers

(2) Pre-Bent 1/4" Stainless Steel Tubing

Ordering Information

Product Number	Compatible Solvent	Max Padding Press. (PSIG)	Cylinders
Y15-ACN01K	Acetonitrile	25	Complete Solvent Padding & Dispensing System w/ Process Station
Y15-ACN40K	Acetonitrile	25	Solvent Padding & Dispensing Assembly w/ Y12-N245 Regulator
Y15-MEH01K	Methanol	25	Complete Solvent Padding & Dispensing System w/ Process Station
Y15-MEH40K	Methanol	25	Solvent Padding & Dispensing Assembly w/ Y12-N245 Regulator

Ordering Information

	Description
Y40-301	Digital Scale w/ 20" x 20.5" platform, $\pm 0.5\%$ accuracy, built in alarm, relays contacts for auxiliary communication
NOS SSG/#	Airgas Safety Products Item; Chemical Resistant Gloves, see Safety Catalog for # sizing
NOS SSA	Airgas Safety Products Item; Chemical Resistant Apron
NOS SSS	Airgas Safety Products Item; Chemical Resistant Sleeves
NOS SSB	Airgas Safety Products Item; Chemical Resistant Booties
S57 826-3X5-BL	Airgas Safety Products Item; Dissipative / Anti-Static Floor Mat

Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

Medical Flow Click Regulators

Description: These single piece body medical regulators are designed with an outlet orifice that controls the flow rate to both medical professionals and their patients. The 221 series regulators are design for helium/oxygen ratio of 80:20 or 70:30 and are supplied with either an 890 medical yoke or a 280 CGA nut and nipple. The 1815 and 1515 series regulators are designed for pure oxygen and are supplied with an 870 medical yoke or a 540 CGA nut and nipple.



Specifications	
Maximum Inlet Pressure	3000 psig
Flow increments	
0-15	0.5, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 15.0
0-20	1.0, 2.0, 3.0, 4.0, 5.0, 8.0, 10.0, 12.0, 15.0, 18.0, 20.0
Outlet pressure	50 psig
Outlet connection	3/16" hose barb
Gauge	1.5" face

Design Features

- Compact, lightweight design – easy for transportation
- Single-piece body construction – provides robust, durable regulator
- Ergonomically friendly five-lobe knob – simplifies hand tightening
- Meets ASTM-G 175-03 promoted ignition standards

Materials	
Body	Aluminum
Seal	Viton
All other Wetted parts	Brass
Gauge	Brass

Ordering Information			
Product Number	Material	Max Inlet Pressure (psig)	Capacity (scpm @ Max Del. Press.)
11-1815OU	Oxygen	870 Yoke	0-15
Y11-1515OU	Oxygen	540 CGA	0-15
Y11-221020	70:30	890 Yoke	0-20
Y11-221120	80:20	890 Yoke	0-20
Y11-221220	70:30	280 CGA	0-20
Y11-221220	80:20	280 CGA	0-20

Fully Automatic Healthcare Changeover

Healthcare Changeover

CHANGEOVER PANELS

Description: This Airgas healthcare changeover meets NFPA-99 2012 safety and performance requirements. It provides a fully automatic control and an integrated circuit board to monitor cylinder bank pressure electronically, controlling switchover and eliminating the need to manually reset the switchover regulator.

The easy to read digital displays shows the delivery pressure and the individual bank pressures. The LED lights notify when the cylinder banks are “in service”, “ready for use” and bank depleted”.



Design Features

- NFPA compliant, fully automatic digital system
- Digital readout can display in psig, kPa or Bar
- Connects to remote alarms systems (up to 3 amps 30 VDC or 2 amps 250 VAC)

Specifications		Materials	
Maximum Inlet Pressure	3500 psig	Primary Regulator Bodies	Brass
Maximum Outlet Pressure	0-15, 0-50 psig	Seats	Neoprene
Maximum Flow Rate	Cv=0.19	Diaphragm	Neoprene
Ambient Temperature	-40° F to +165° F	Filter	Sintered Bronze
Weight	4 LBS	Seals	EPDM, Teflon
Inlet Ports	¼ " FNPT	Line Regulator Bodies	Aluminum
Outlet Ports	¼ " Hose Barb	Seat	Neoprene
Relief Valve	0.42/100 psi	Diaphragm	Neoprene
		Seals	Neoprene, Buna-N

Ordering Information

Product Number	Gas Type	Number of Cyl	Delivery Pressure (psig)	Flow Capacity (scfh)
Y11-AGFHM2-346	Air	2	30-70	2000
Y11-AGFHM2-580	Helium	2	30-70	2000
Y11-AGFHM2-540	Oxygen	2	30-70	2000
Y11-AGFHM2HL-320	CO2	2	30-70	500
Y11-AGFHM2HL-326	N2O	2	30-70	500
Y11-AGFHM2HP-580	Nitrogen	2	100-190	3000

Healthcare Header Manifolds

Healthcare Header Manifold

Manifold

Description: These Airgas healthcare header manifolds are designed to be used with Y11-AGFHM2 healthcare changeover. These headers with conjunction of the changeover comply with NFPA 99 code. These healthcare headers are supplied with a left and right side header, NFPA complaint pigtails, mounting brackets, a master shut off valve and audio/visual alarm. Airgas offers the header as an one cylinder by one cylinder setup up to a four cylinder by four cylinder standard.



Design Features

- Trouble-free wall mounting assembly
- Easy change out – no interruption supply to user's process

Specifications

Maximum Inlet Pressure	3000 psig
Temperature Range	0 to 140 F
Outlet Connection	½" NPT
Weight	5 lbs

Materials

Manifold	Brass
Master Valve	Brass
Master Valve Seat	PCTFE
Master Valve Packing	PTFE
Pigtails *	Stainless steel braid with inner core PTFE and brass end fittings

*copper pigtails for oxygen service

Ordering Information

Product Number	Number of Cylinders	Max Pressure (psig)	Manifold Material
Y15-AGWHSV2-CGA	2	3000	Brass
Y15-AGWHSV4-CGA	4	3000	Brass
Y15-AGWHSV6-CGA	6	3000	Brass
Y15-AGWHSV8-CGA	8	3000	Brass

Air = CGA 346
Carbon Dioxide = CGA 320
Helium, Nitrogen = CGA 580
Oxygen = CGA 540 * Copper pigtails
Nitrous Oxide = CGA 326

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

www.airgas.com

Laser Applications

Engineering the Right Solutions



Airgas Laser Start-Up Kits

Description: Airgas Laser Start-Up Kits provide the essential equipment for supplying resonator and assist gases from source to point-of-use. All kits contain switchover systems for the resonator gases, high-flow dome-loaded regulators for the assist gases and cylinder process stations. Kits also include purges and “T” filters to protect laser optics.

Design Features

ASSIST GAS KITS

- Two high-flow dome-loaded regulators for nitrogen and oxygen
- Two heavy duty ½" I.D. x 50 ft hoses
- 90 micron “T” filters to protect laser internal components
- Commonly used fittings for easy hook-up
(Some laser models may require additional fittings sold separately.)

RESONATOR GAS KITS

- High-purity automatic switchovers with purges for each resonator gas
- 100 ft. of laser grade tubing for high-purity laser gases
- 2 micron “T” filter to protect laser optics
- Cylinder process station for switchover mounting and securing high pressure cylinders safely
(Some laser models may require additional fittings sold separately.)



* Kit shown is for premix gases. Three gas models will have switchover manifolds for nitrogen, helium and carbon dioxide

Ordering Information

Product Number	Description
Y40-4703500	Bystronic laser start-up kit, 3-gas*
Y40-4703501	Trumpf laser start-up kit, 3-gas*
Y40-4703502	Mazak resonator and assist gas kit
Y40-4703503	Universal assist gas kit
Y40-4703504	Universal premix start-up kit for Amada, Cincinnati, Fanuc, & Rofin
Y40-4703505	Universal 3-gas start-up kit for Esab and PRC*
Y40-4703506	Trumpf assist gas Nitrogen only kit

*Pictured Rack included.



Y99-G600P

Airgas Laser Start-Up Kits Cont.

Ordering Information		
Kit Part Number and Description	Items supplied in kit	Quantity of Item (ea) per Kit
Y40-4703500 Bystronic Resonator Equipment Package	Six Cylinder Rack with Process Station	1
	N2/He Automatic Switchover w/Purges	2
	CO2 Automatic Switchover w/Purges	1
	Airgas SIP filter	1
	Tubing, 8mm x 100'	1
	Tube Fitting, 8 mm x 1/4 MNPT	1
Y40-4703501 Trumpf Resonator Equipment Package	Six Cylinder Rack with Process Station	1
	N2/He Automatic Switchover w/Purges	2
	CO2 Automatic Switchover w/Purges	1
	Airgas SIP filter	1
	Tubing, 8mm x 100'	1
	Tube Fitting, 8 mm x 1/4 MNPT	6
Y40-4703502 Mazak Resonator and Assist Gas Package	High Purity Brass 0-125 psi delivery two stage regulator with CGA 580 w/block and bleed purge	1
	Airgas SIP filter	1
	Tube Fitting, 8 mm x 1/4 MNPT	2
	Tubing, 8mm x 100'	1
	Dome Loaded Regulator 0-250 psi w/CGA 540	1
	Dome Loaded Regulator 0-500 psi w/CGA 580	1
	1/2" MNPT 90 Micron T-Filter	2
	50' Hose, 1/2" ID, 2000 psi, 1/2" flare fitting x 1/2" npt fittings	2
	1/2" NPT elbow	2
	1/2" male An x 3/8 BSPP	2
	1/2" 37 degree flare x 1/2" FNPT fitting	2
	1/2" FNPT x 3/8" NPT elbow	4
	Dome Loaded Regulator 0-250 psi w/CGA 540	1
	Dome Loaded Regulator 0-500 psi w/CGA 580	1
	1/2" MNPT 90 Micron T-Filter	2
	50' Hose, 1/2" ID, 2000 psi, 1/2" flare fitting x 1/2" NPT fittings	2
	1/2" NPT elbow	2
	1/2" male An x 3/8 BSPP	2
	1/2" 37 degree flare x 1/2" FNPT fitting	4
Y40-4703503 Universal Assist Gas Equipment Package	Two Cylinder Rack with Process Station	1
	N2/He Automatic Switchover w/Purges	1
	Airgas SIP filter	1
	Tubing, 8mm x 100'	1
	Tube Fitting, 8 mm x 1/4 MNPT	2
	Six Cylinder Rack with Process Station	1
Y40-4703504 Universal Premix Start-up Kit suitable for Amada, Cincinnati, Fanuc, Rofin	N2/He Automatic Switchover w/Purges	2
	CO2 Automatic Switchover w/Purges	1
	Airgas SIP filter	1
	Tubing, 8mm x 100'	1
	Tube Fitting, 8 mm x 1/4 MNPT	6
	Dome Loaded Regulator 0-500 psi w/CGA 580	1
Y40-4703505 Universal Three Gas Resonator Start-up Kit suitable for Esab, PRC	1/2" MNPT 90 Micron T-Filter	1
	50' Hose, 1/2" ID, 2000 psi, 1/2" flare fitting x 1/2" NPT fittings	1
	1/2" NPT elbow	1
	1/2" male An x 3/8 BSPP	1
	1/2" 37 degree flare x 1/2" FNPT fitting	2
Y40-4703506 Trumpf Assist Gas Nitrogen Only Kit		

Laser Hoses

Laser

ASSIST GAS HOSES

Description: These Airgas reinforced laser hoses are ideal for setting up the assist gas delivery systems for new and existing lasers. The convenient multiple-length options allow for easy installation, and also changes to the assist gas supply. These hoses have great chemical compatibility for all assist gases including oxygen. The material is easy to bend for fast, easy installations. The hoses are rated to 2,000 psi with a designed safety factor of 4:1.



Specifications	
Temperature Range	-40°F to + 212°F
Max Allowable Working Pressure	2000 psi
Minimum Burst Pressure	4x Max Working Pressure at 73F
Minimum Bend Radius	3"
End Connections/Material	½" MNPT w/37 degree JIC Swivel / Zinc Plated Steel
Tube Material	Nylon reinforced with Fiber
Cover Material	Polyurethane

Design Features

- **Matted Jacket core** – to allow for a low coefficient of friction for better flow characteristics
- **Excellent chemical compatibility** – can be used with air, oxygen and nitrogen assist

Single-Stage Ordering Information

Product Number	Length	ID size
Y40-4300660	10 FT	0.5"
Y40-4300656	25FT	0.5"
Y40-4300652	50FT	0.5"

Note: Replacement ½" MNPT x 37 degree JIC swivel end fitting is part #Y40-9006743. Replacement fittings sold individually (each).

Lasing Gas Semi Automatic Changeover Panels

- 0–50 and 0–125 PSIG Delivery Mode
- Pre Mix and Individual Gases

Description: The automatic changeover panel provides continuous, uninterrupted gas supply to the resonator. When the service cylinder is empty, the unit will automatically withdraw gas from the reserve cylinder, eliminating the need to shut down the laser to replace empty cylinders. The pressure gauges immediately indicate which cylinder is in use. A line regulator maintains a constant delivery pressure to the laser.

The manifolds are provided complete with 24" stainless steel (corrugated bellows) flexible pigtails and inlet purge assembly. The purge assembly CGA has an integrated check valve in the nose, minimizing the amount of contaminants that enters during cylinder change out. The block and bleed valves remove contaminants that enter during cylinder change out.

For applications using portable cylinder banks we strongly recommend the 6-ft. pigtail option. This is to facilitate the safe positioning of the banks in front of the manifold.

Alarm systems to indicate that cylinder changeover has occurred can be factory installed at an additional cost.



Design Features

Automatic Changeover

provides uninterrupted high-purity gas supply.

Control Knob

permits safe removal of the empty cylinder while another cylinder is in use.

Convolutd Stainless Steel Diaphragms

provide superior leak integrity without contamination from non-metallic liner or seal.

Purge Assembly on Pigtails

CGA has a check valve incorporated to reduce the amount of contaminants that enter during cylinder change out. The block and bleed valves remove the contaminants.

Wall Mount Panel

affords easy on-site installation.

Specifications	
Maximum Rated Inlet Pressure	3,000 PSIG
Outlet Pressure Ranges	0 – 50 or 0 - 125 PSIG
Ambient Operating Temperature	-40° F to +140° F
Designed Leak Rate	1 X 10 ⁻⁸ cc/sec He
Weight	11 lbs
Outlet	1/4" FNPT
Pigtails	24" Flexible Stn Steel w/purge assemblies

Materials	
Body	Nickel-Plated Brass
Bonnet	Nickel-Plated Brass
Seat	PTFE
Diaphragm	316L Stainless Steel
Inlet Gauge	2" Nickel-Plated Brass
CGA Connections	Nickel-Plated Brass w/Integral Check Valve
Block and Bleed Valves	Nickel-Plated Brass Packless Diaphragm
Outlet Gauge	2" Nickel-Plated Brass
Filter (10-micron)	Nickel-Plated Bronze Sintered

Ordering Information

Product Number	Material	No. of Cylinders	CGA	Max Outlet Pressure (psig)	Capacity (scfh air @ Max Del. Press.)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
Y11LGS50320	Brass	2	320	50	700	4000	100
Y11LGS125320	Brass	2	320	125	1000	4000	200
Y11LGS50350	Brass	2	350	50	700	4000	100
Y11LGS125350	Brass	2	350	125	1000	4000	200
Y11LGS50580	Brass	2	580	50	700	4000	100
Y11LGS125580	Brass	2	580	125	1000	4000	200

Available Options

Description	
Y15-4P72K2C	6' Pigtails for use with portable cylinder banks (2 Cylinder Kit)
Y78-820ALPK	Standard Alarm Package (Non-Explosion-Proof)
Call 800-939-5711	Flammable Gas Alarm Package (Explosion-Proof)

PRESSURE REGULATORS

Special Service



Airgas® LaserPLUS™ High-Flow Dome-Loaded Laser Regulators

Description: The Airgas® Special Service Laser Regulator is a high-flow dome-loaded regulator. This regulator has an integral remote sensing pilot which yields high flow capacity with near perfect performance, unique in a compact unit.

Since this regulator is dome loaded by a remote sensing pilot regulator, it becomes a servo-regulator, and the overall performance is determined by the performance of the pilot regulator.

This Laser Regulator is the key component in laser applications.

Design Features

Standard Encapsulated Seats With 10-micron Filters

Use With a Variety of Gases

argon, helium, nitrogen, oxygen.

Tamper Proof

self-seating internal safety valve.

Conforms to CGA E-4 Standard

for use with gas pressure regulators.

Panel Mounting Option

Bonnet threaded for mounting.

Specifications	
Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Range	0-250, 0-500, 0-1,000 psig
Flow Capacity	Cv = 0.55
Decay Inlet Characteristics	0.3/100 psi
Ambient Temperature	70° F
Designed Leak Rate	1 x 10 ⁻⁶ scc/sec
Weight	8 lbs. (3.63 kg)
Ports	1/4" FNPT
Inlet	1/2" FNPT
Outlet	1/2" FNPT
Gauge Size	2 1/2" diameter

Materials	
Body	Brass bar stock
Bonnet	Brass bar stock
Seat	PTFE
Diaphragm	PTFE
Gauges	Brass
Filter	Nickel-plated sintered bronze – 10 microns
Seals	PTFE
Elastomeric Seals	Neoprene®

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Outlet Gauge Range (psig)
Y11-750250	Brass	3,000	250	7,500	0-4,000	0-400
Y11-750500	Brass	3,000	500	15,800	0-4,000	0-600
Y11-7501000	Brass	3,000	1,000	29,500	0-4,000	0-2,000

Available Options

Product Number	Description
Y11-9100887	Panel Mounting Kit

Airgas® LaserPLUS™

Assist Gas Laser Station

- Liquid Cylinder Supply
- Nitrogen and Oxygen Supply

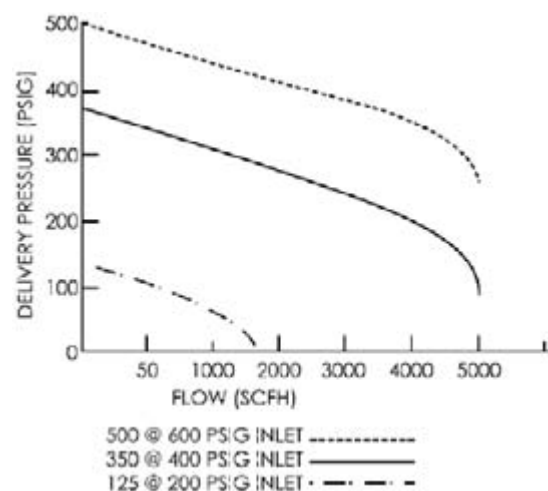
Description: These single-assist gas protocol stations are designed to provide a safe, reliable method to wall-mount a single cylinder regulator, thus eliminating the need to handle the regulator during cylinder change out. The brackets are fabricated from type 304 stainless steel for durable long life, and come complete with a single-stage regulator.

The manifolds are provided complete with 36" stainless steel (corrugated bellows) flexible pigtails. The CGA has an integrated check valve in the nose, minimizing the amount of contaminants that enters during cylinder change out.

The regulators are single stage with a 316 stainless steel diaphragm and come in either a 0 – 350 for oxygen and nitrogen, or 0 – 500 psi delivery pressure for nitrogen if required. Oxygen regulators are specifically cleaned for Oxygen service.

Assist Gas Laser Stations

LASER EQUIPMENT



Specifications & Materials	
Maximum Rated Inlet Pressure	3,000 PSIG
Ambient Operating Temperature	-20° F to +120° F
Weight	8 LBS
Pigtails	36" Stainless Steel Corrugated Bellows
Bracket	304 Stainless Steel
Fittings	Nickel-Plated Brass
Regulator	Single Stage w/316 Stainless Steel Diaphragm
CGA Connection	Nickel-Plated Brass

Ordering Information			
Product Number	CGA Connection	Delivery Pressure	Cylinders
Y15AG350540	540	3000 psi Inlet – 350 psi Delivery	1
Y15AG350580	580	3000 psi Inlet – 350 psi Delivery	1
Y15AG500580	580	3000 psi Inlet – 500 psi Delivery	1

Airgas® LaserPLUS™ Assist Gas Changeover

- 10–400 PSIG Delivery (Adjustable)
- Nitrogen and Oxygen Service

Description: This high-purity brass fully automatic manifold electronically controlled system provides an uninterrupted supply of gas, continuously checks itself for any leaks and recognizes the new cylinders that replaced the depleted ones as the new standby reserve cylinders automatically. This manifold is designed to work with high-pressure cylinders.

Design Features

Automatic Changeover

Provides uninterrupted high-purity gas supply with no operator re-setting required

Remote A/V Alarm

Audio and visual notification from remote locations, 1000' from control enclosure

72" Flexible Pigtails w/Purge Assembly

Stainless steel corrugated bellows pigtails, with CGA w/integral check valve and block and bleed valves

Telemetry Alarm Contacts

Two sets of dry contacts standard for interface with standard telemetry systems.

Control Enclosure

NEMA 4X, can be located outdoors and includes lockable latches

Mechanical Enclosure

NEMA 1X, can be located outdoors, placement up to 100 feet from control enclosure

Operational Features

Built-in Leak Detection

Standby cylinder reserves are continually monitored for leaks

LCD Information Panel

Panel displays left and right cylinder contents and pipeline delivery pressures

System Status LED's

Six system status LED's (Green, Amber & Red) included to indicate the condition of the gas supply

One-touch priority

Flip a switch to prioritize the primary and reserve banks

Pressure Change With Push of a Button

Change the cylinder switchover pressure with the push of a button

Assist Gas Changeover

LASER EQUIPMENT



Materials

Body	Brass Barstock
Bonnet	Die Cast (Painted)
Diaphragm	302 Stainless Steel
Inlet Gauge	Transducer to LCD Panel
Nozzle	Brass
Seat	PTFE
Seals	PTFE
Seat Return Spring	Stainless Steel
Filter (10) Micron	Nickel-Plated Sintered Bronze
Helium Leak Rate	1 x 10 ⁻⁸ cc/sec He
Relief Valve	YES

Specifications

Maximum Inlet Pressure	3,000 PSIG
Maximum Delivery Pressure	10-400 PSIG (adjustable)
Inlet	½" FNPT
Outlet	½" FNPT
Temperature Range	-20 - 140° F
NEMA 4x and 1x Enclosures	Yes

Ordering Information

Product Number	Material	No. of Cylinders	CGA	Max Outlet Press. (psig)	Capacity (scfh @ Max Del. Press.)	Inlet LCD Range (psig)	Delivery LCD Range (psig)
Y11-EAG400580	Brass	2	580	10 - 400	1000	3000	400
Y11-EAG400540	Brass	2	540	10 - 400	1000	3000	400
Y11-EAG400(CGA)							

Available Options

Description

Remote Alarm, 12V with Two system status LED's & Audible buzzer

Remote Alarm, 12V with Four system status LED's & Audible buzzer

Switchover Alert Phone Dialer

PC based Telemetry, Wireless Web Based

Web page monitoring, calls phone/pager/emails alert messages (Hardware)

Available upon special request only – call 800-939-5711

Web page monitoring, calls phone/pager/emails alert messages (Wireless)

Available upon special request only – call 800-939-5711

Airgas® LaserPLUS™ Assist Gas Changeover

- 500/10 - 225 PSIG Delivery (Adjustable)
- Argon, Nitrogen and Oxygen Service

Description: This high-purity brass fully automatic manifold electronically controlled system provides an uninterrupted supply of gas, continuously checks itself for any leaks and recognizes the new cylinders that replaced the depleted ones as the new standby reserve cylinders automatically. This manifold is designed to work with liquid gas cylinders, commonly called Dewars.

Design Features

Automatic Changeover

Provides uninterrupted high-purity gas supply with no operator re-setting required

Remote A/V Alarm

Audio and visual notification from remote locations, 1000' from control enclosure

72" Flexible Pigtails w/Purge Assembly

Stainless steel corrugated bellows pigtails, with CGA and integral check valve, and block and bleed valves

Telemetry Alarm Contacts

Two sets of dry contacts standard for interface with standard telemetry systems.

Control Enclosure

NEMA 4X, can be located outdoors and includes lockable latches

Mechanical Enclosure

NEMA 1X, can be located outdoors, placement up to 100 feet from control enclosure

Operational Features

Built-in Leak Detection

Standby cylinder reserves are continually monitored for leaks

LCD Information Panel

Panel displays left and right cylinder contents and pipeline delivery pressures

System Status LED's

Six system status LED's (Green, Amber & Red) included to indicate the condition of the gas supply

One-touch priority

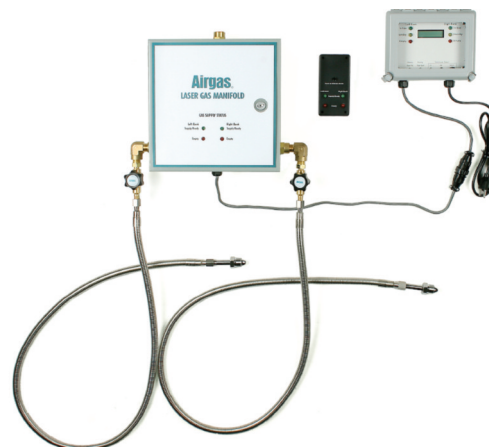
Flip a switch to prioritize the primary and reserve banks

Pressure Change With Push of a Button

Change the cylinder switchover pressure with the push of a button

Assist Gas Changeover

LASER EQUIPMENT



Materials

Body	Brass Barstock
Bonnet	Die Cast (Painted)
Diaphragm	302 Stainless Steel
Inlet Gauge	Transducer to LCD Panel
Nozzle	Brass
Seat	PTFE
Seals	PTFE
Seat Return Spring	Stainless Steel
Filter (10) Micron	Nickel-Plated Sintered Bronze
Helium Leak Rate	1 x 10 ⁻⁸ cc/sec He
Relief Valve	YES

Specifications

Maximum Inlet Pressure	500 PSIG
Maximum Delivery Pressure	10-225 PSIG (adjustable)
Inlet	½" FNPT
Outlet	½" FNPT
Temperature Range	-20 - 140° F
NEMA 4x and 1x Enclosures	Yes

Ordering Information

Product Number	Material	No. of Cylinders	CGA	Max Outlet Press. (psig)	Capacity (scfh @ Max Del. Press.)	Inlet LCD Range (psig)	Delivery LCD Range (psig)
Y11EVAG225580	Brass	2	580	10 - 225	1000	3000	250
Y11EVAG225540	Brass	2	540	10 - 225	1000	3000	250

Available Options

Description

- Remote Alarm, 12V with Two system status LED's & Audible buzzer
- Remote Alarm, 12V with Four system status LED's & Audible buzzer
- Switchover Alert Phone Dialer
- PC based Telemetry, Wireless Web Based
- Web page monitoring, calls phone/pager/emails alert messages (Hardware)
Available upon special request only - call 800-939-5711
- Web page monitoring, calls phone/pager/emails alert messages (Wireless)
Available upon special request only - call 800-939-5711

Airgas® LaserPLUS™ Beam Delivery Gas Laser Stations

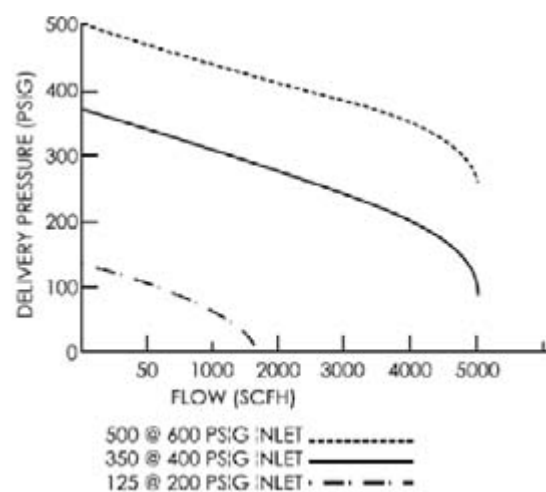
Description: These single Beam Delivery gas protocol stations are designed to provide a safe, reliable method to wall-mount a single cylinder regulator, thus eliminating the need to handle the regulator during cylinder change out. The brackets are fabricated from type 304 stainless steel for durable long life, and come complete with a single-stage regulator.

The manifolds are provided complete with 36" stainless steel (corrugated bellows) flexible pigtails and inlet purge assembly. The purge assembly CGA has an integrated check valve in the nose, minimizing the amount of contaminants that enters during cylinder change out. The block and bleed valves remove contaminants that enter during cylinder change out.

The regulators are single stage with a 316 stainless steel diaphragm and come in either a 0 – 250, 0 – 350, or 0 – 500 psi delivery pressure.

Liquid Cylinder Supply

REGULATORS



Specifications & Materials	
Maximum Rated Inlet Pressure	3,000 PSIG
Ambient Operating Temperature	-20° F to +120° F
Weight	8 LBS
Pigtails	36" Stainless Steel Corrugated Bellows
Bracket	304 Stainless Steel
Fittings	Nickel-Plated Brass
Regulator	Single Stage w/316 Stainless Steel Diaphragm
CGA Connection	Nickel-Plated Brass
Block and bleed Valves	Packless Diaphragm Nickel-Plated Brass

Ordering Information			
Product Number	CGA Connection	Delivery Pressure	Cylinders
Y15-BDD250580	580	500 Inlet – 250 psi Delivery	1
Y15-BDD350580	580	500 Inlet – 350 psi Delivery	1
Y15-BDD500580	580	500 Inlet – 500 psi Delivery	1

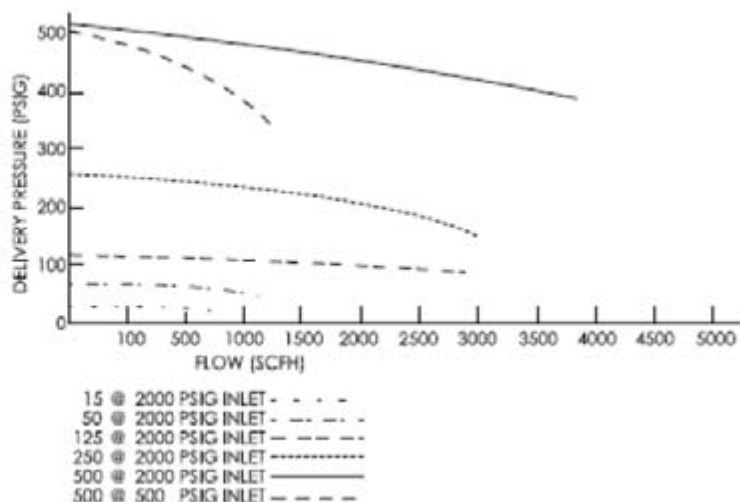
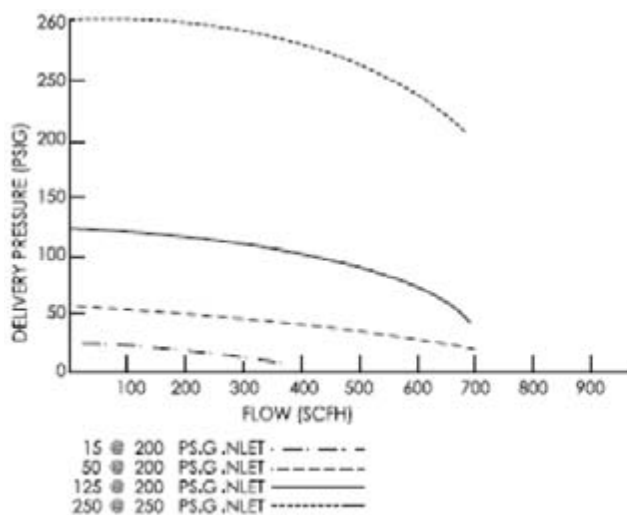
Airgas® LaserPLUS™ Beam Delivery Gas Regulator

Description: These single Beam Delivery gas regulators are designed to provide a safe, reliable method to mount a single cylinder regulator in line, thus eliminating the need to handle the regulator during cylinder change out. Suitable for connection to existing nitrogen system for supply of gas for beam delivery protection.

The regulators are single stage with a 316 stainless steel diaphragm in either a 0 – 250 or 0 – 500 psi delivery pressure.

Cylinder Supply

REGULATORS



Specifications & Materials

Maximum Rated Inlet Pressure	3,000 PSIG
Ambient Operating Temperature	-20° F to +120° F
Weight	2 LBS
Fittings	Nickel-Plated Brass
Regulator	Single Stage w/316 Stainless Steel Diaphragm

Ordering Information

Product Number	CGA Connection	Delivery Pressure
Y15-BDC2504F	1/4"	3000 Inlet – 250 psi Delivery
Y15-BDC5004F	1/4"	3000 Inlet – 500 psi Delivery

Tri Gas Rack

Description: These unique mounting racks are specifically designed to mount gas delivery systems like change over manifolds for three gases in a very small space. These are ideal for analytical laboratories or for CO₂ laser systems.

Each rack can support 6 cylinders, three change over manifolds, and in the case of the laser also mount the beam purge regulator and assist gas regulator.

The rack is made from steel and is powdered coated in white for a long lasting finish. The mounting surfaces have adjustable mounting tracks to adapt to all types of regulator and manifold control sections mounting configurations

If the rack is ordered with the gas delivery systems Airgas can mount these and ship the unit completely assembled.



Ordering Information				
Product Number	Description	Dimensions	Material	Weight
Y99-6TRACK	Tri Surface Mounting Rack	Each side 25" wide x 72" high	Powdered Coated Steel	205 lbs

Plasma Point of Use Panel

Plasma Gas Panel

Point of Use Panel

Description: This plasma point of use panel is design to work in conjunction with six gases those are required for a plasma cutting machine. Each gas source has its own regulator to provide proper delivery pressure to the application. These high pressure Airgas AS241 regulators can handle up 3000 psig inlet pressure and each regulator comes with its own outlet quarter turn diaphragm valve for shut off. All six regulators are mounted on one panel for easy mounting.



Design Features

- **Filtered Seat (10 micron):**
for added gas stream purity and extended service life.
- **Stainless Steel Diaphragms:**
eliminate outgassing associated with elastomeric diaphragms.
- **Bar Stock Body:**
provides low internal volume.
- **Encapsulated Filtered Seat Assy:**
protect valve seat, extend service life.
- **Chrome Nickel-Plated Brass Body:**
provides long-lasting good looks; will not tarnish.
- **Mounting of individual regulators:**
Prevents confusion between gases at point of use

Specifications

Maximum Rated Inlet Pressure	3,000 psig
Outlet Pressure Ranges	250 psig
Flow Capacity	Cv=0.08
Ambient Operating Temperature	-40° F to +165° F
Designed Leak Rate	Bubble-Tight (helium)
Weight	14 lbs
Regulator Ports (4)	1/4" FNPT
Decay Inlet Characteristic	1.8 psi/100 psi

Materials

Body	Chrome Nickel-Plated Brass
Bonnet	Chrome Nickel-Plated Brass
Seat	PTFE
Diaphragm	316 Stainless Steel
Gauge	2 1/2" Nickel-Plated Brass
Filter	Nickel-Plated Bronze
Valve Stem	316 Stainless Steel
Valve Spring	18-8 Stainless Steel
Trim	Nickel-Plated Brass
Plate	12- gauge steel powder coated paint

Ordering Information

Product Number	Material	Max Inlet Pressure (psig)	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del Pressure)	Delivery Gauge Range (psig)
Y75-C1AS241F	Brass	3000	250	890	0-400

Airgas Quality Policy

The purpose of the Airgas Quality System is to continually improve our manufacturing and related processes to provide our customers with the highest product purity, consistency, and service.

www.airgas.com

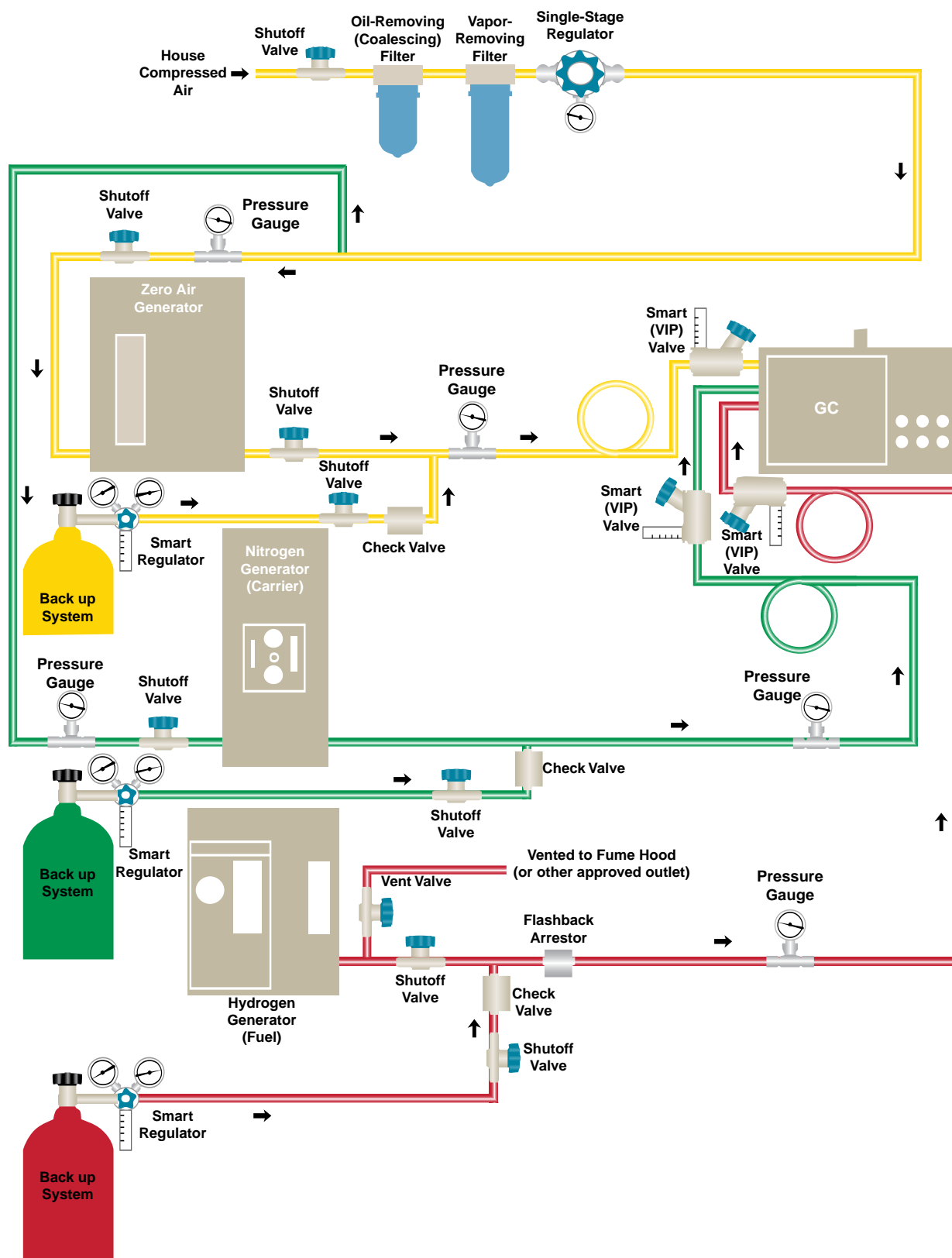
Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions

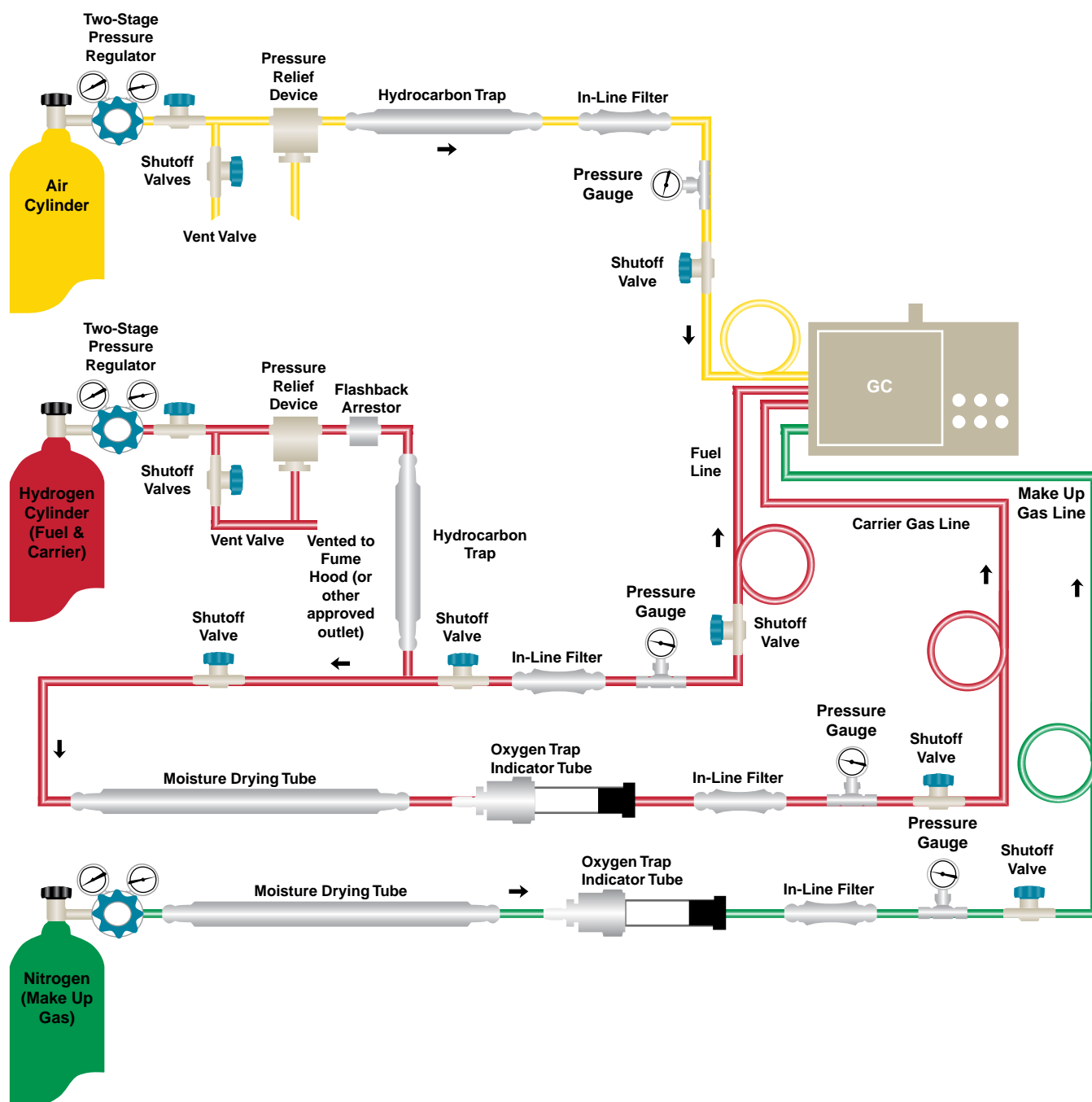


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You'll find it with us.™

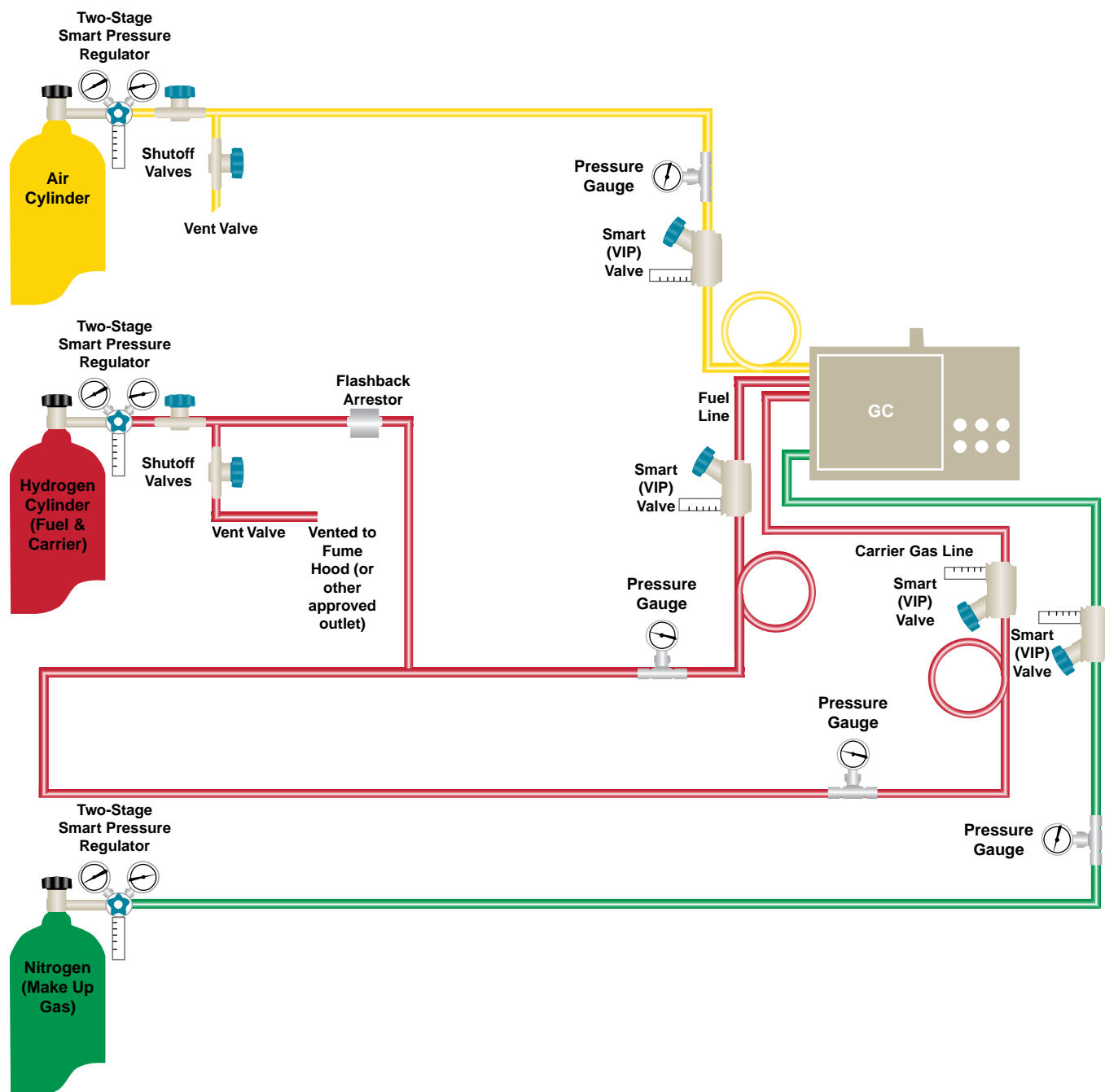
GC Supplied with all Gases Using Generators with Cylinder Back Up “Smart Design”



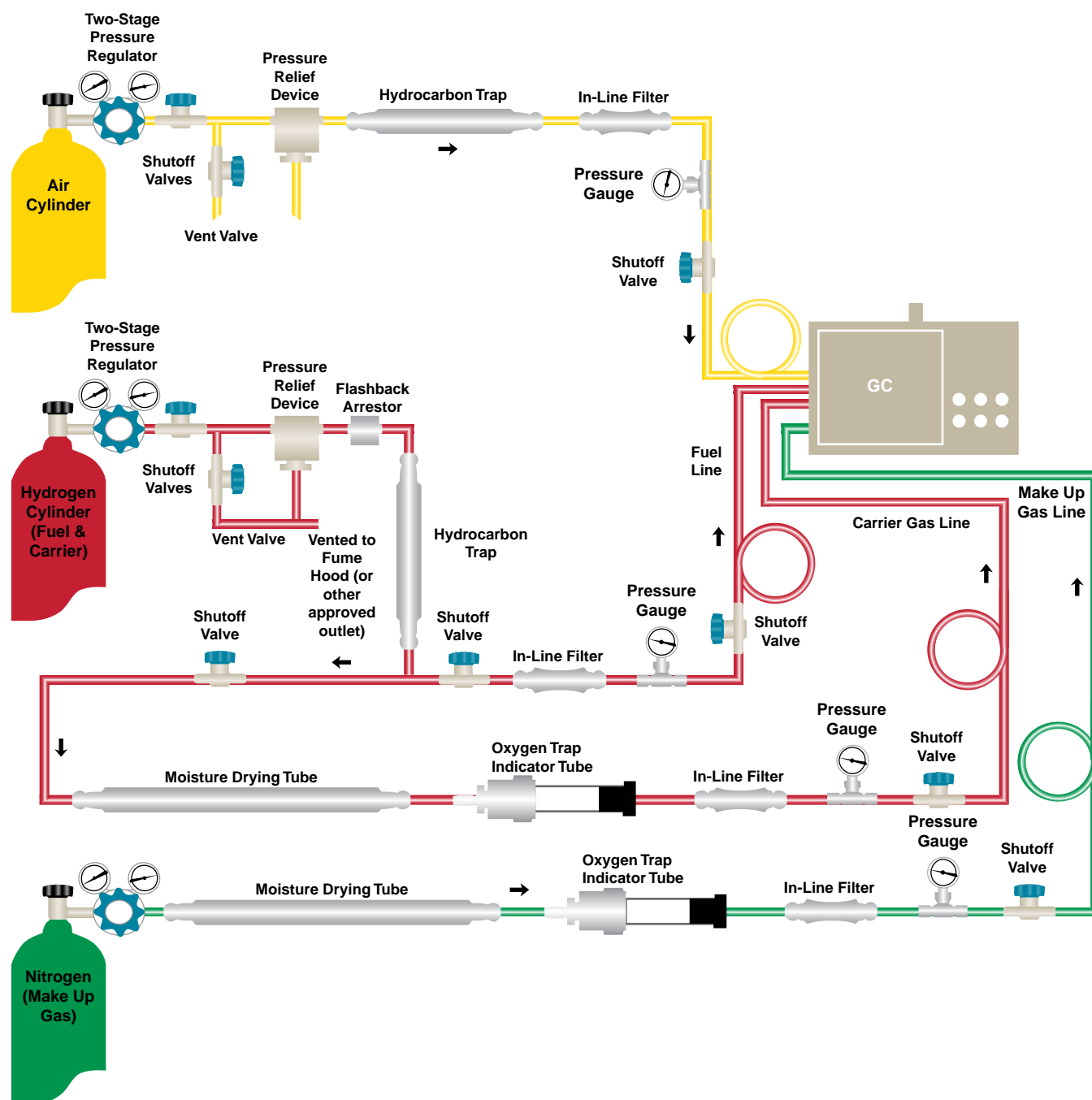
GC Installation Using Hydrogen as both Carrier and Fuel Gas Using Cylinder the “Traditional Design”



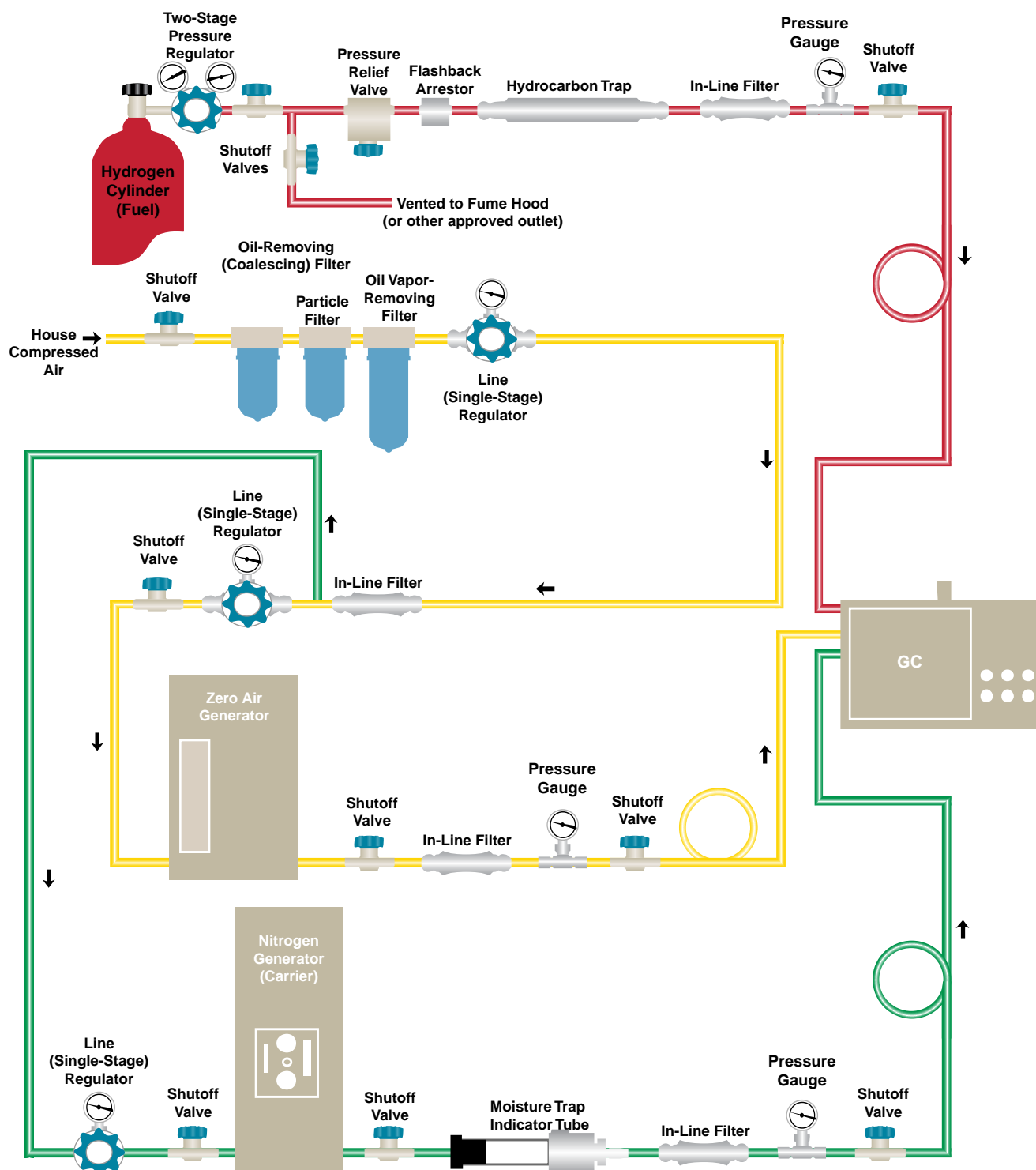
GC Installation Using Hydrogen as Both Carrier and Fuel Gas Using Cylinders the “Smart Design”



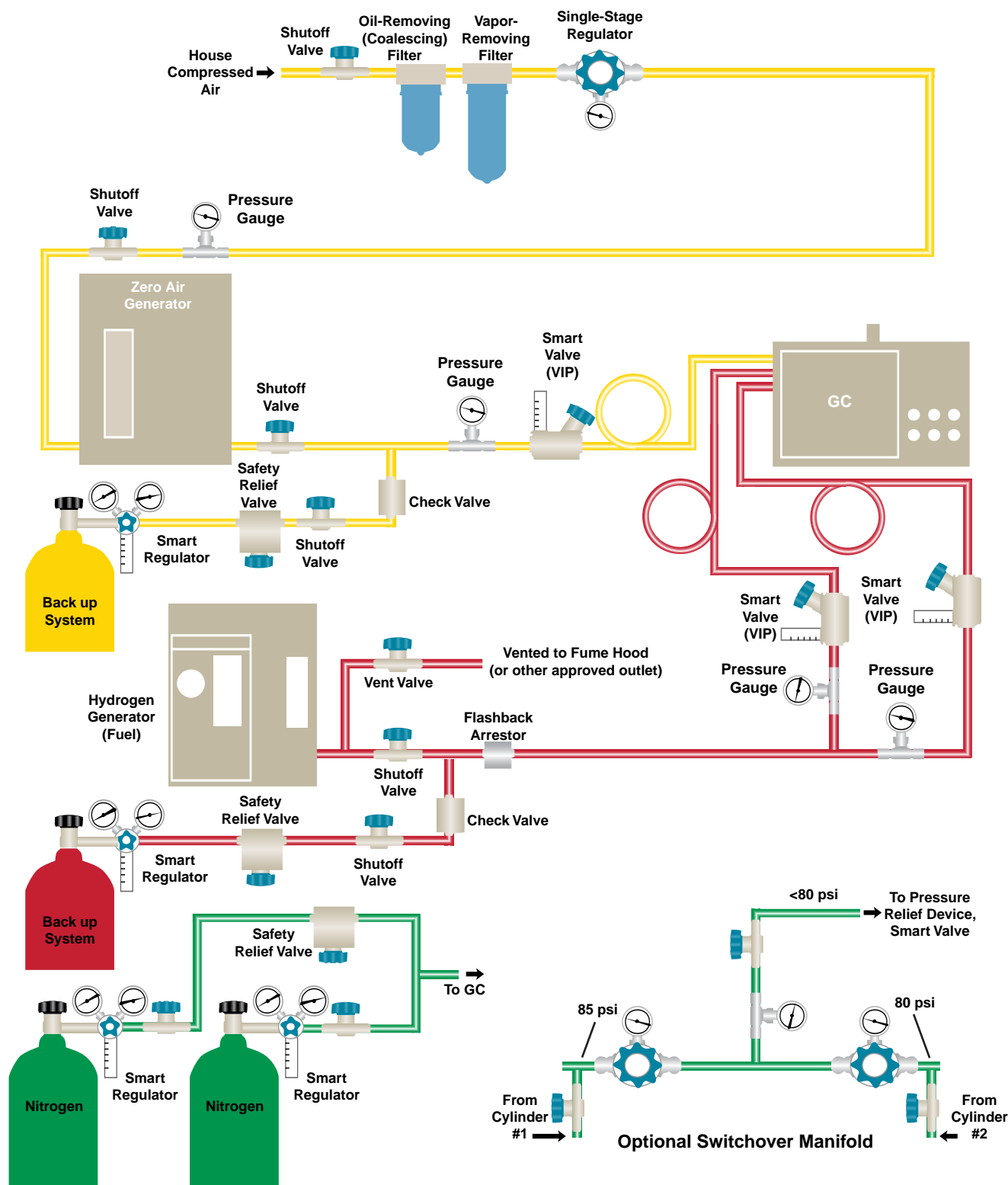
GC Installation Using Hydrogen as both Carrier and Fuel Gas Using Cylinder the “Traditional Design”



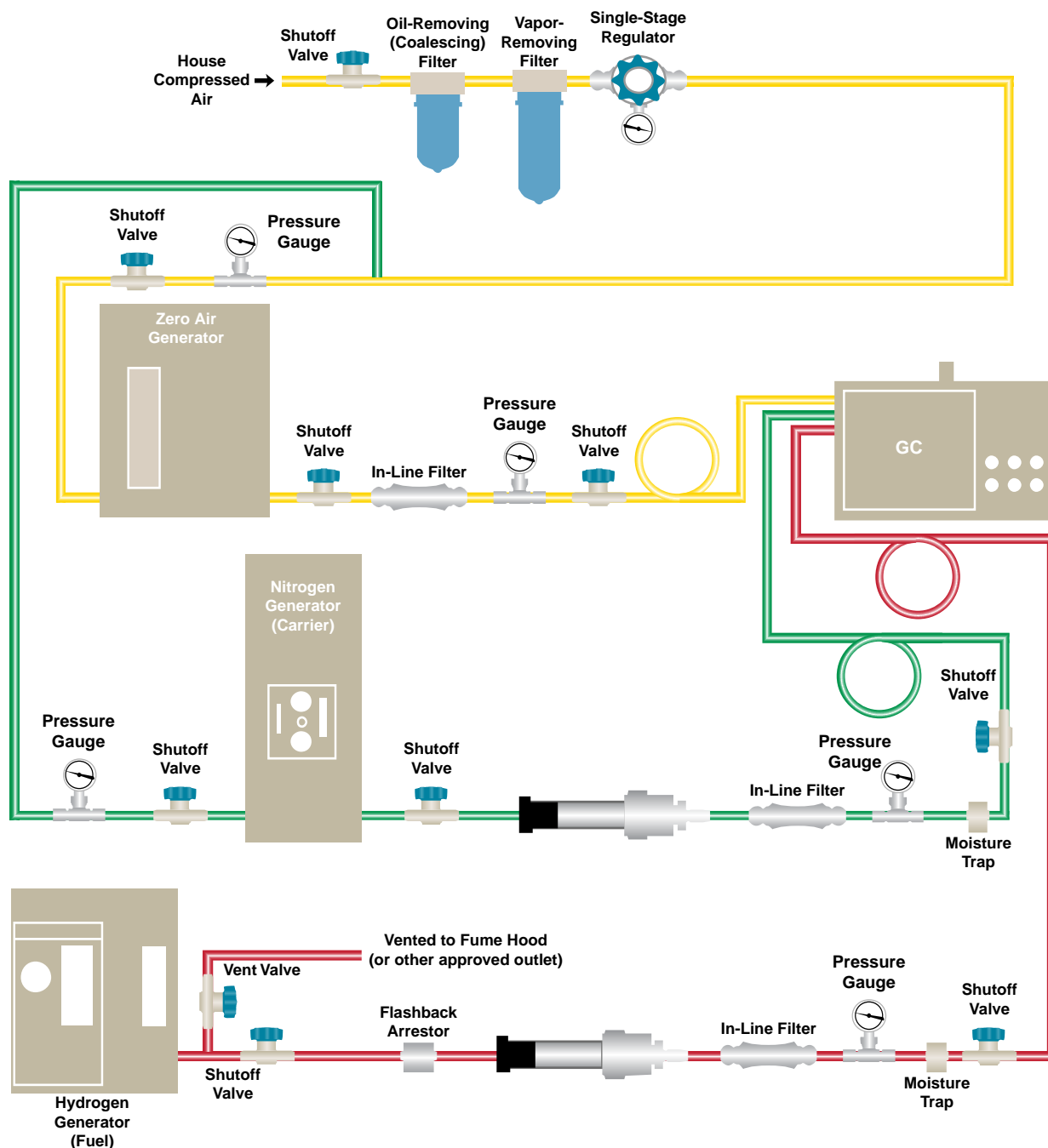
GC with Nitrogen Carrier Gas and Zero Air Supplied by Generators H₂ Supplied by Cylinders No Back Up System “Traditional Method”



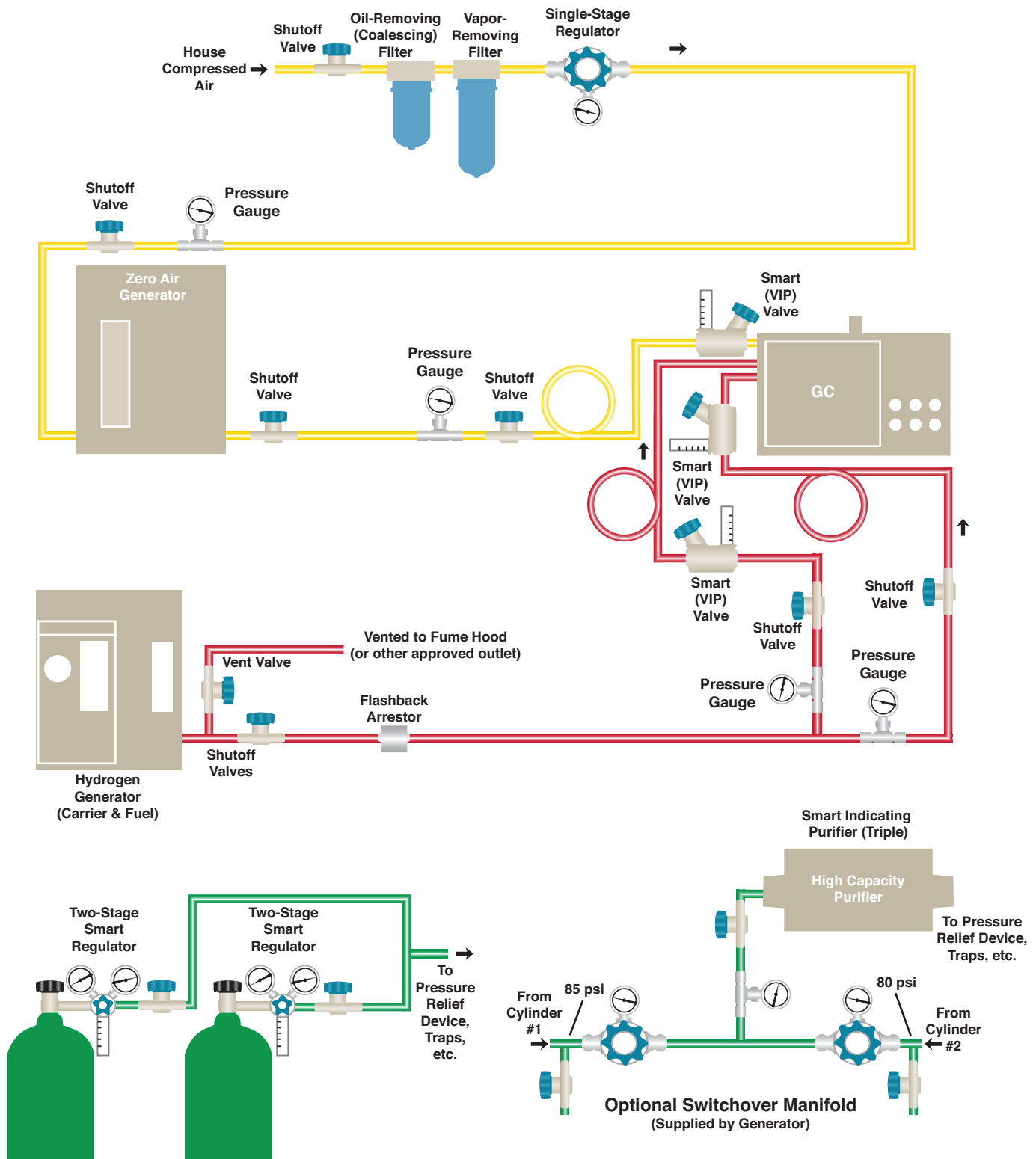
GC with Hydrogen Used as Carrier and Fuel Zero Air Supplied by Generator, N₂ Make Up Gas from Cylinders “Smart Way” w/Cylinder Back Up



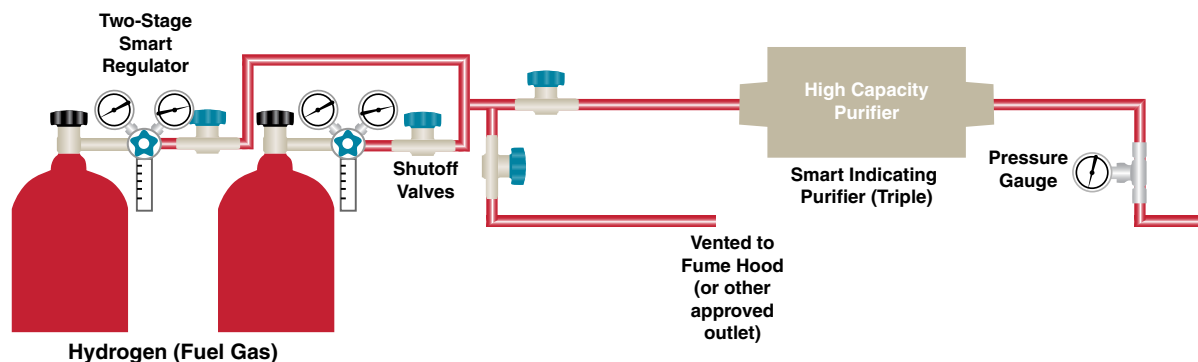
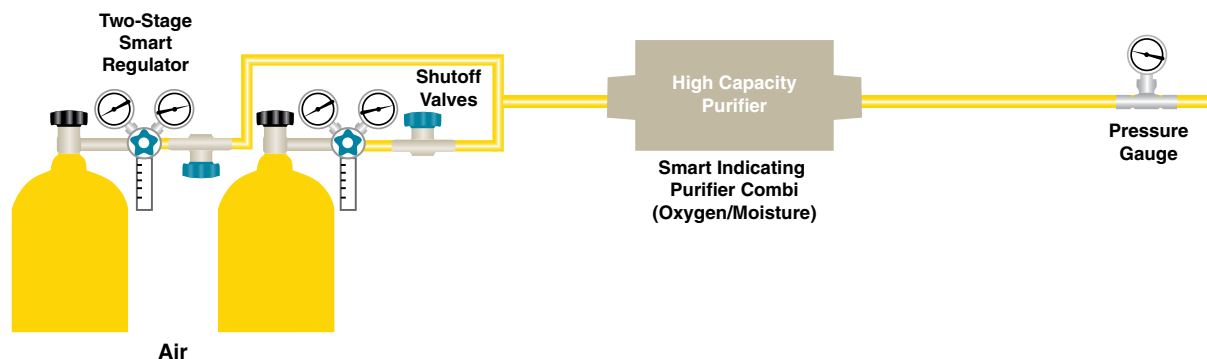
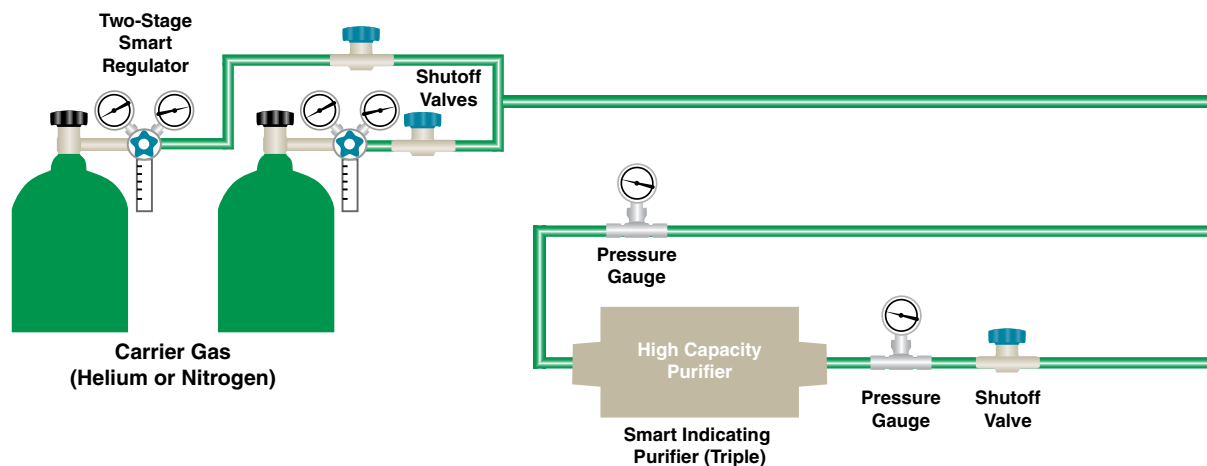
GC N₂ Carrier, H₂ Fuel Supplied with all Gases Using Generators “Traditional Method” No Back Up



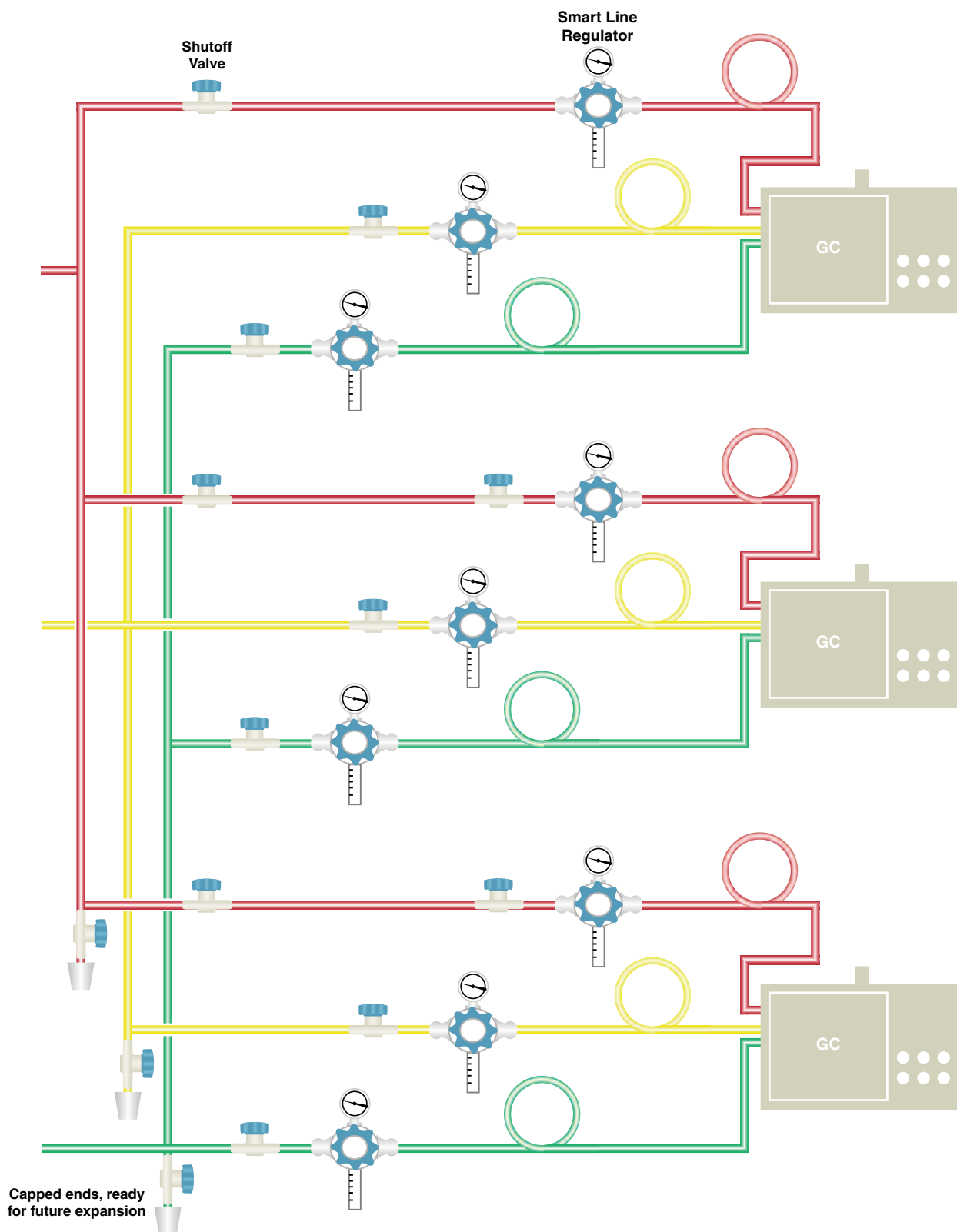
GC with Hydrogen Used as Carrier and Fuel, Supplied by Generator, Zero Air Supplied by Generator, N₂ Make Up Gas From Cylinders “Traditional Method”



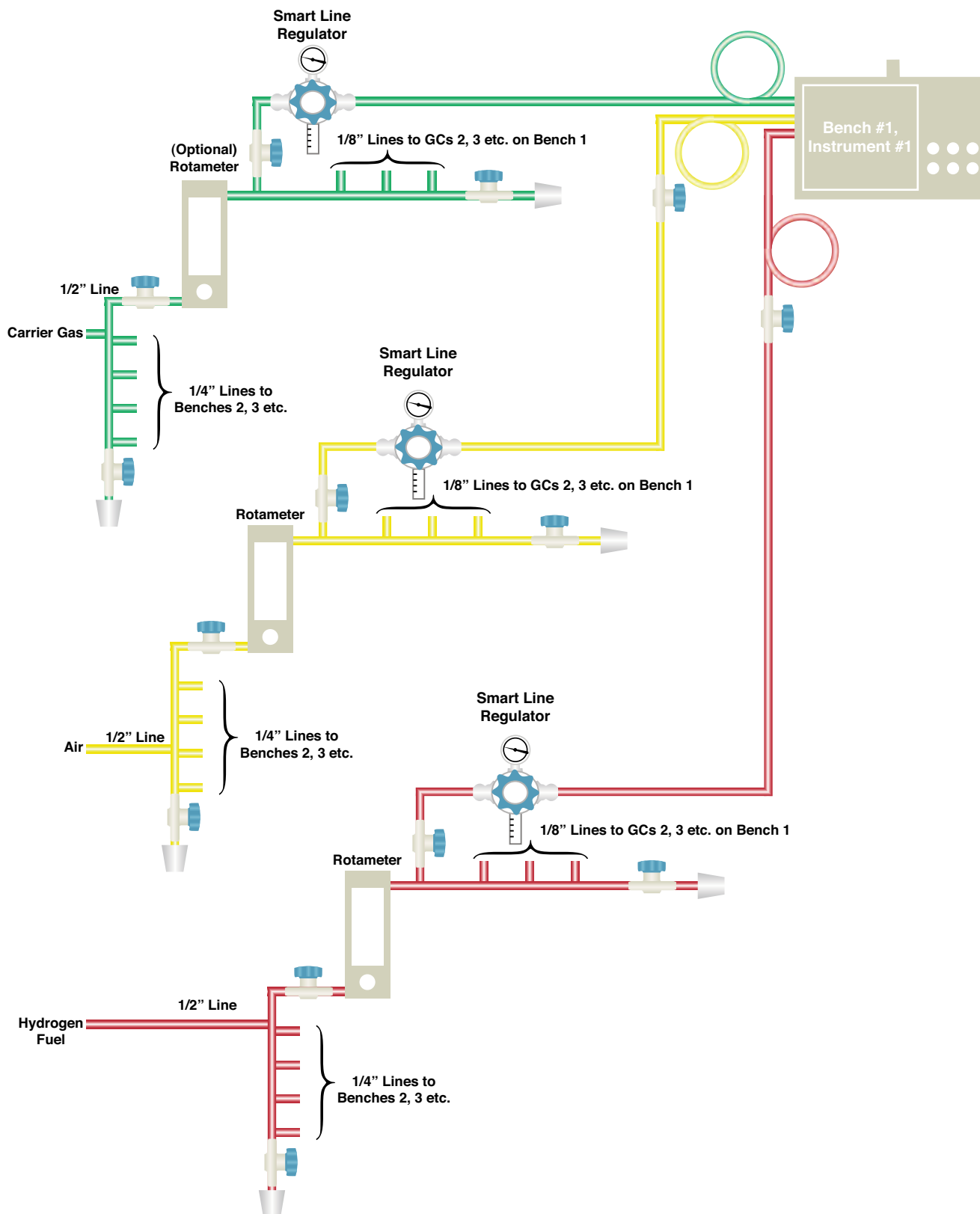
Central Gas Supply for Multiple GC's "Smart Way"



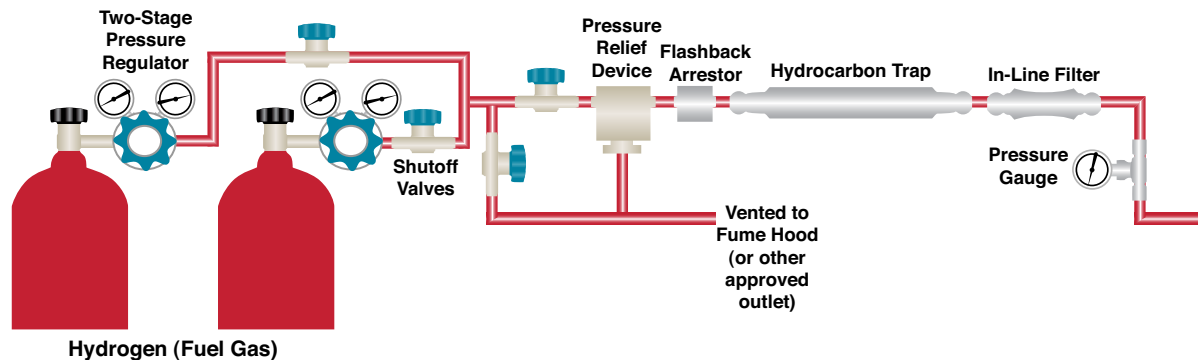
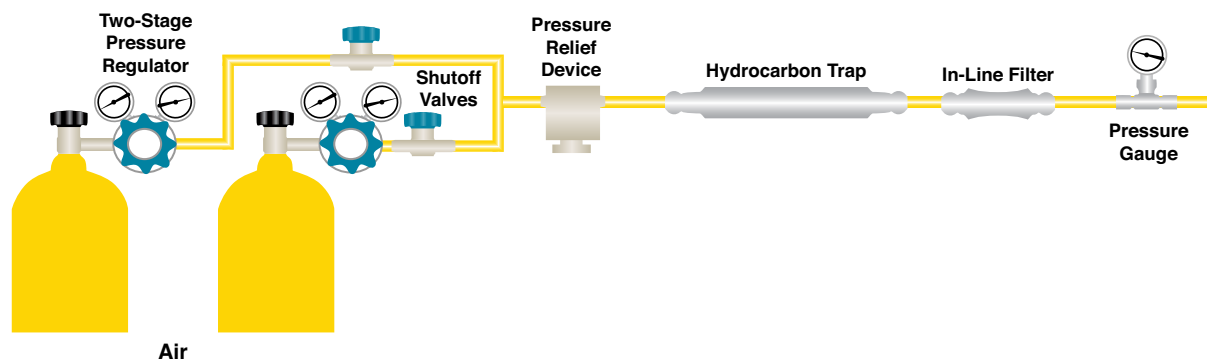
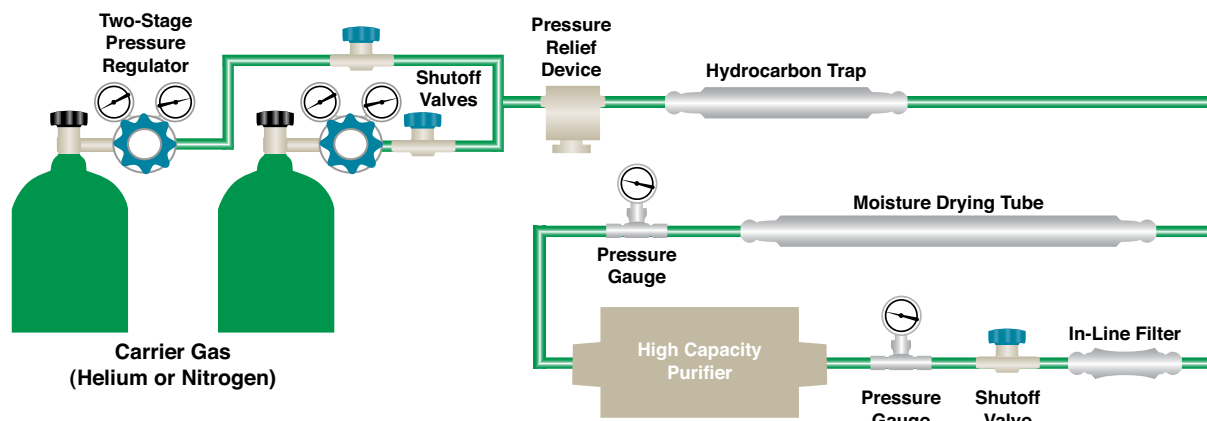
Central Gas Supply for Multiple GC's "Smart Way"



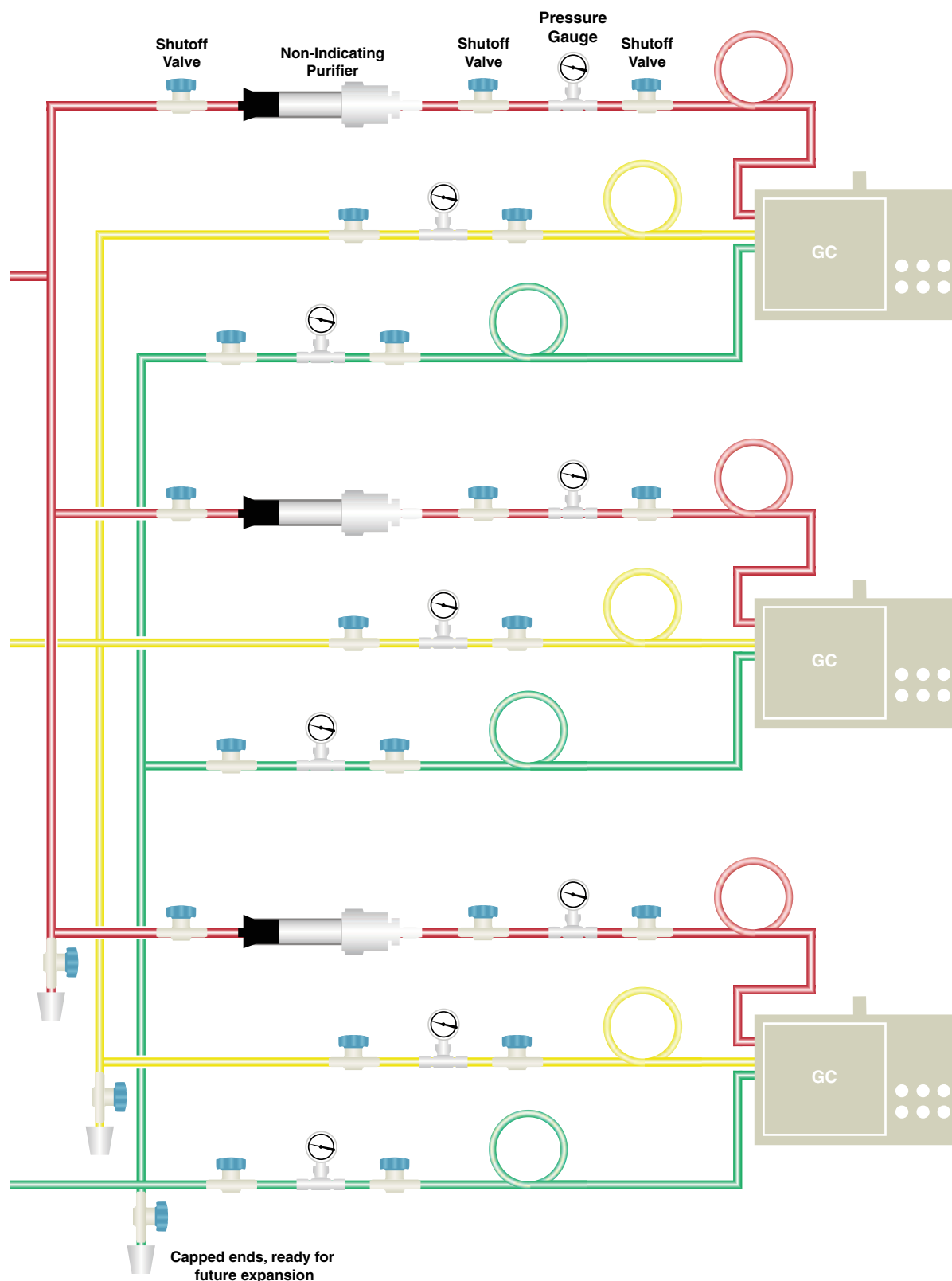
Central Gas Supply for Multiple GC's "Smart Way"



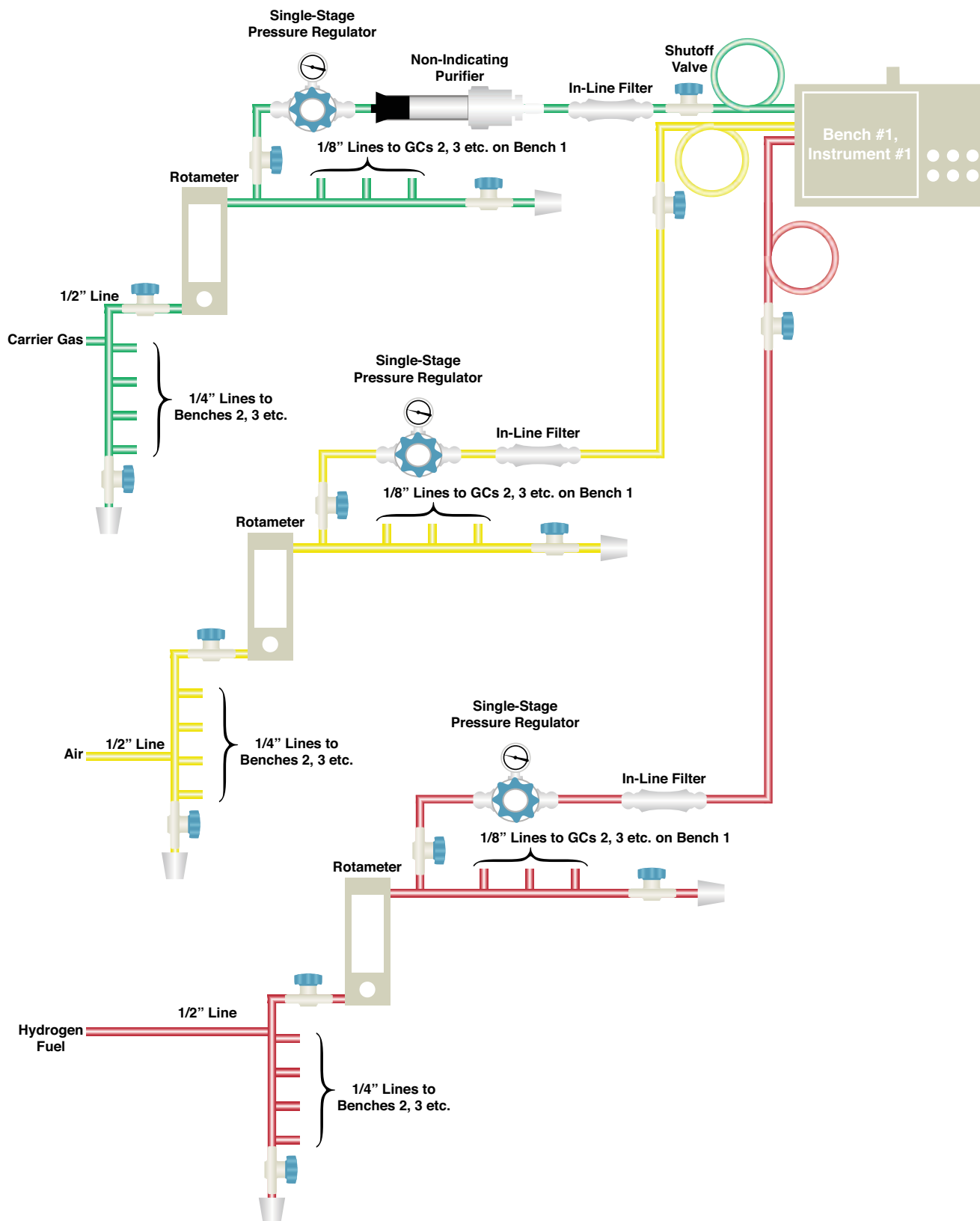
Central Gas Supply for Multiple GC's “Traditional Method”



GC's Fed from Central Gas Supply "Traditional Method"



Central Gas Supply Feeding Multiple GC's, Flow Controlled Flowmeters "Traditional Method"



Specialty Gases and Equipment
Product Reference Guide

Engineering the Right Solutions



Airgas.
You'll find it with us.™

DESIGN ASSISTANCE

FOR ARCHITECTS AND ENGINEERS

Gas delivery and cryogenic solutions for laboratory design



Designing a laboratory means making critical decisions. Deciding on the proper gases and cryogenic delivery and management systems is one of those decisions. From locating information to specifying purity levels to answering technical questions regarding gas specification, storage, safety, compliance, sourcing, monitoring and distribution, Airgas works alongside your design team to build the best gas delivery and management systems for your customers. Whether it's a new design or retrofit of an existing laboratory, we'll work hand in hand to help you create the proper system to ensure all laboratory processes work correctly and efficiently. Airgas will ensure your project exceeds your client's requirements for operational performance, safety and code conformance.

As the country's largest supplier of industrial, medical, and specialty gases and related equipment, safety supplies and MRO products and services, Airgas can assist in all aspects of your project and help identify improvements for even the most complex system. With more than 16,000 associates in approximately 1,100 locations nationwide, we have the right resources and the right expertise to meet your projects' requirements. From breaking ground to commissioning, Airgas is here to help.

Airgas
an Air Liquide company

Airgas.com

Finding the right fit.

Our experienced teams have the tools to assist with the design and installation of complete laboratory gas systems. As a provider of gases and services to the automotive, environmental, food and beverage, metallurgy and glass, chemicals and petrochemicals, electronics and semiconductor, pharmaceutical, biotechnology, medical, university research, and power utilities markets, we understand the specific requirements of different markets and have the skill to deliver the results they need.

We work directly with architects, engineering firms, design-to-build firms, MEP firms and general contractors, specializing in:

Laboratory Design — new construction or retrofit

- System guide for laboratory gases and cryogenics
- Turn-key laboratory piping design and installation solutions
- CAD drawing support — individual equipment and project specific layouts
- Coordinated and cooperative project management

Gas Management Systems

- Specialty gases, process chemicals, and industrial applications
- Flammable, toxic, corrosive, high-purity, high-pressure, and high-flow systems
- Fully automated gas cabinets and safety systems
- Gas detection and monitoring support systems

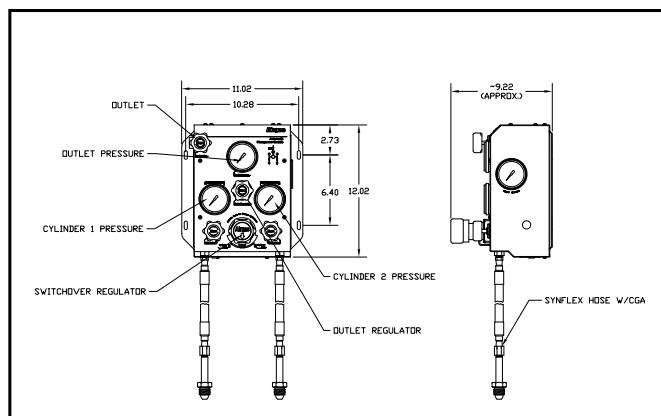
Custom Gas Delivery Systems

- Automated gas control systems
- High pressure system design
- Gas mixing systems
- Unique application solutions

Cryogenic Management and Design

- Bulk cryogenic storage and delivery solutions
- Robust gas delivery systems, on-site separation units, generators, tube trailers
- On-site and off-site cryorepositories; *OUTLOOK®* inventory management solutions
- Vacuum-insulated piping for Liquid Nitrogen
- Remote monitoring and alarm systems

Airgas complements your business unit and maximizes end user satisfaction by helping you find the perfect fit to bring your gas delivery system from concepts to reality.



Partnering for the right solutions.

Airgas partners with you from start to finish on your laboratory construction project. We'll help you customize the right solutions for your design.

Airgas offers many services to assist architect/engineering firms involved with specialty gas system design, including:

- Facility/laboratory gas distribution layout
- Risk-based central gas supply consulting and design
- Detailed specialty gas equipment needs assessment
- Material selection — equipment and piping
- Equipment and container sizing
- Safety consulting and safety management review

You'll find it with us...

Airgas stays involved in your project through completion, working with the general and sub-contractors to offer continuing support for any technical questions that may arise about gas system components and cryogenic systems. We're here to field questions, concerns and issues that delay construction projects. We work with the end users of the laboratory to help with operational and safety training of the systems. Airgas understands that the gas delivery system is a small part of a project, but we know that it's a key element in the success of a construction project. Your lab construction project's success depends on the results it will deliver. Airgas can help your analytical instrumentation perform at the highest purity possible.

Find out why more architects and engineers are turning to Airgas for help with laboratory gas system design and installation.

Call **314-488-8079** or email A&E@airgas.com today. Request your copy of the **A&E Systems Guide for Laboratory Gases and Cryogenics**.



Statement of Capabilities

Airgas is known for engineering the right solutions for customers' specialty and industrial gas handling and distribution needs. Airgas provides equipment and service solutions to a wide variety of businesses in the process, manufacturing, pharmaceutical and research industries. Following is a brief description of Airgas services.

- Laboratory Gas System Design

With more than 20 years of gas system design and installation experience, Airgas provides facility gas distribution layout consulting and detailed design (material selection, tubing sizing, valve and other related equipment specifications). We also offer turnkey installations or installation support and project management. Following a risk-based central gas supply philosophy, we advocate removing all compressed gas cylinders from the laboratory workplace and relocating the cylinders to centralized controlled areas. Required gases are delivered to each point of use through an engineered piping network. Our risk-assessment approach helps streamline the design and allows available resources to minimize the impact of high-risk scenarios.

- Working With Architects and Engineers

Airgas offers many services to assist architect/engineering firms involved with specialty gas system design, including:

- Facility/laboratory gas distribution layout
- Risk-based central gas supply consulting and design

- Specialty gas equipment needs assessments
- Material selection – equipment and piping
- Detailed equipment specifications
- Equipment sizing
- Safety consulting and safety management review
- Engineering the Right Solutions

Airgas engineers specialize in designing, fabricating, and installing custom gas control and distribution systems. We'll help you define your needs and present you with the most effective and efficient solutions. Our systems are designed using the latest technologies, follow the latest codes and standards, and meet applicable regulatory requirements. We provide documented systems complete with operating procedures and maintenance recommendations. When designs are approved and finalized, we fabricate the systems and can also install the systems at your site. Typical systems include:

- Gas mixing systems – low- and high-flow
- Automated gas control systems
- High-pressure system designs
- Toxic and corrosive gas handling systems design

Specialty Gases and Equipment Product Reference Guide

Engineering the Right Solutions



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World Wide Cylinder Connections

Based on Gas

CYLINDER CONNECTION CHART

Gas		UHP DISS	CGA	BS	DIN	AFNOR	JIS
Air	Air		590	3	6		
Ammonia	NH3	720	660/705/240	10	6	C	22-R
Argon	Ar	718	580	3	6	C	22/23-R
Arsenic Pentafluoride	As2F5	642			8		
Arsine	AsH3	632	350	4	1	E	22-L
Boron Trichloride	BCl3	634	660	14	8	J	22-L
Boron Trifluoride	BF3	642	330	14	8	J	22-L
Bromochlorodifluoromethane	BrCClF2		660	6	6	C	
Bromotrifluoromethane	BrCF3		660	6	6	C	
Butane	C4H10		510	9	1	E	23-L
Carbon Dioxide	CO2	716	320	8	6	C	
Carbon Monoxide	CO	724	350	4	6	E	22-L
Carbonyl Sulfide	COS		330			E	
Chlorine	Cl	728	660	6,14	8	J	26-R
Chlorine Trifluoride	ClF3		670	6		P	26-L
Chlorodifluoromethane	CHClF2		660	6	6	C	
Chlorotrifluoromethane	CClF3		660		6	C	
Diborane	B2H6	632	350	4			22-L
Dichlorodifluoromethane	CCl2F2	716	660	6	6	C	
Dichlorofluoromethane	CCl2FH		660	6	6	C	
Dichlorosilane	H2SiCl2	636	678	16	6		
Dichlorotetrafluoroethane	C2Cl2F4		660	6	6	C	
Diethylzinc	(C2H5)2Zn	726	510				
1,1-Difluoroethylene	C2F2H2		350		1	E	22-L
Dimethylzinc	(CH3)2Zn	726					
Dimethylamine	C2H7N		705	11	1	E	22/26-L
Dimethylether	C2H6O		510		1	E	26-L
Disilane	Si2H8	632				E	
Ethane	C2H6		350		1	E	22-L
Ethyl Chloride	C2ClH5		300	7,17	1	E	26-L
Ethylene	C2H4		350	2	1	E	22-L
Fluorine	F2		679/670		8	F	22-R
Germane	GeH4	632	350			E	
Halocarbon-14	CF4		580	6	6	C	
Helium	He	718	580	3	6	C	22/23-R
Hydrogen	H2	724	350	4	1	E	22-L
Hydrogen Bromide	HBr	634	330		8	K	26-R
Hydrogen Chloride	HCl	634	330		8	K	26-R
Hydrogen Fluoride	MF	638	670/660	6		K	26-R
Hydrogen Iodide	HI		330			K	
Hydrogen Selenide	H2Se	632	350	4	6	E	
Hydrogen Sulfide	H2S	722	330	16	6	E	
Isobutane	C4H10		510	2	1,2,4	E	
Isobutylene	C4H8		510	2	1	E	23-L
Krypton	Kr	718	580	3	6	C	22/23-R
Neon	Ne	718	580	3	6	C	22/23-R

CYLINDER CONNECTION CHART

Based on Gas

World Wide Cylinder Connections

Gas		UHP DISS	CGA	BS	DIN	AFNOR	JIS
Nitrogen	N2	718	580, 677, 680	3	10	C	22/23-R
Nitrous Oxide	N2O	712	326	13	11	G	
Oxygen	O2	714	540	3	9	F	22/23-R
Perfluoropropane	C3F8	716	660				
Phosgene	CCl2O		660	6,14	8	K	26-R
Phosphine	PH3	632	350	4	1	E	
Phosphorus Pentafluoride	PF5	642	330				
Silane	SiH4	632	350	3	1	E	
Silicon Tetrachloride	SiCl4	636		Compression Fittings			
Silicon Tetrafluoride	SiF4	642					
Sulfur Dioxide	SO2		660	7	10,16	K	26-R
Sulfur Hexafluoride	SF6	716	590	6	6	C	
Trichlorosilane	HSiCl3	636					
1,1,1-Trichlorotrifluoroethane	C2Cl3F3	716	660				
Trichlorofluoromethane	CCl3F		660				
Trifluoromethane	CF3H		660				
Trimethylamine	C3H9N		705	11	1	E	26-L
Tungsten Hexafluoride	WF6	638	670		8	J	
Vinyl Bromide	C2H3Br		510		1	E	26-L
Vinyl Chloride	C2ClH3		510	7	1	E	26-L
Vinyl Fluoride	C2FH3		350		1	E	22-L
Xenon	Xe	718	580	3	6	C	22/26-L

(1) This list is for your reference only. The cylinder connections are for pure gases only, mixtures will change the cylinder connection. Check with the gas supplier for the proper cylinder connection for gas mixtures.

Source of Information:
CGA V 1 2005
BS 341 Part 1 1991
DIN 477 Teil 1
AFNOR NF E 29 -650
JIS (Jap.) B 8246 2004

Gas Grade Selection Table for Gas Chromatography (GC)

Detector	Minimum Gas Grade Recommended for Your Limit of Detection			
	Trace (0–1 ppm)	1–1,000 ppm	1,000 ppm–1%	1%–100%
FID (Flame Ionization Detector)				
Helium	Research	UPC	UPC	UHP
Nitrogen	Research	UPC	UPC	UHP
Hydrogen	Research	UPC	UPC	UHP
Air	Ultra Zero	Ultra Zero	Zero	Zero
Carbon Dioxide	SFC/SFE	SFC/SFE	SFC/SFE	SFC/SFE
ECD (Electron Capture Detector)				
Carbon Dioxide	SFC/SFE	SFC/SFE	SFC/SFE	SFC/SFE
P5	ECD	ECD	ECD	N/A
Nitrogen	Research	Research	UPC	N/A
Helium	Research	Research	UPC	N/A
TCD (Thermal Conductivity Detector)				
Helium	Research	Research	UPC	UHP
Nitrogen	Research	UPC	UPC	UHP
Argon	Research	UPC	UHP	UHP
Hydrogen	Research	UPC	UHP	UHP
FPD (Flame Photometric Detector)				
Nitrogen	Research	UPC	N/A	N/A
Helium	Research	UPC	N/A	N/A
Hydrogen	Research	UPC	N/A	N/A
Air	Ultra Zero	Ultra Zero	N/A	N/A
PID (Photoionization Detector)				
Argon	UPC	UPC	UPC	N/A
Nitrogen	UPC	UPC	UPC	N/A
Helium	UPC	UPC	UPC	N/A
Hall® (Electrolytic Conductivity Detector)				
Helium	Research	UPC	N/A	N/A
Hydrogen	Research	UPC	N/A	N/A
Nitrogen	Research	UPC	N/A	N/A
Air	UPC	UPC	N/A	N/A
MSD (Mass Selective Detector)				
Helium	Research	UPC	UPC	UHP
Nitrogen	Research	UPC	UPC	UHP
Hydrogen	Research	UPC	UPC	UHP
Argon	Research	UPC	UHP	UHP
HID (Helium Ionization Detector)				
Helium	Research	Research	N/A	N/A
Helium Purge	UPC	UPC	N/A	N/A
DID (Discharge Ionization Detector)				
Helium	Research	Research	Research	N/A
Helium Purge	UPC	UHP	UHP	N/A
USD (Ultrasonic Detector)				
Argon	Research	Research	UPC	UHP
Helium	Research	Research	UPC	UHP
SCD (Sulfur Chemiluminescent Detector)				
Hydrogen	UPC	UPC	UHP	N/A
Air	Ultra Zero	Ultra Zero	Zero	N/A
PFPD (Pulsed Flame Photometric Detector)				
Hydrogen	Research	UPC	N/A	N/A
Air	Ultra Zero	Ultra Zero	N/A	N/A
Nitrogen	Research	UPC	N/A	N/A
Helium	Research	UPC	N/A	N/A
PDD (Pulsed Discharge Detector)				
Helium	Research	Research	UPC	N/A
He Purge	UPC	UHP	UHP	N/A
2% Argon/Helium	Research	Research	UPC	N/A
2% Krypton/Helium	Research	Research	UPC	N/A
2% Xenon/Helium	Research	Research	UPC	N/A

BIP® technology (an Air Products innovation) gases are available for argon, helium and nitrogen. For gas chromatography, *BIP* technology represents the best choice for purity. See the Special Applications section for more details.

Diaphragm Valve Procedures

Recommended Opening Procedure

On most diaphragm valve designs, the hand-wheel travels about 1¼ turns from full open to close. Upon opening you will feel a resistance for approximately one turn, at which point all or most of the resistance will disappear. At this point, the upper stem has traveled upward so as to lose contact with the diaphragms. The valve should be full open at this point, but you should avoid backseating the upper stem. This will avoid confusion as to whether the valve is open or closed.

A slight difference is experienced with tied diaphragm valves. In these valves the upper stem is mechanically connected to the diaphragm. Because of this, there is no loss of contact and therefore no free spinning of the upper stem. Aside from the more restricted feel of the valve, the valve should still be fully open but not backseated, avoiding confusion as to whether the valve is open or closed.

Recommended Closing Procedure

Generally, diaphragm valves are difficult to close. The reason for this difficulty lies in the design. When the valve is opened, full cylinder pressure is exerted on the diaphragms. The diaphragms have a surface area approaching one square inch and the pressure on this large surface area makes it difficult to push the diaphragms down. When closing the valve against cylinder pressure, about 60% of the closing force goes toward pushing the diaphragms down, while only 40% of the force is transmitted to the seat. Therefore, when a pressurized diaphragm valve is closed to the recommended 10 ft/lb and the valve outlet is depressurized, the closing force on the seat is only 4 ft/lb. Most diaphragm valves are either weeping through at this point or just barely closed. Because of this design quirk, it is necessary to use a double close on these valves. This procedure requires the operator to close the valve as tightly as possible by hand (gloved hands are recommended), then vent the pressure in the valve outlet and reclose the valve immediately. This is commonly referred to as double-closing. Never use wrenches or similar devices to operate the valve, as internal damage to the valve may result.

For more information on cylinder valves, and their design and use, call the Airgas Technical Information Center at **1-877-ASG-4-GAS**.

Conversion Tables and Dew Points

Density (Mass/Volume)

	g/ml	kg/m ³	lb/ft ³	lb/gal	lb/in ³
g/ml		10 ³	6.2428 x 10 ¹	8.3454	3.6127 x 10 ⁻²
kg/m ³	10 ⁻³		6.2428 x 10 ⁻²	8.3454 x 10 ⁻³	3.6127 x 10 ⁻⁵
lb/ft ³	1.6018 x 10 ⁻²	1.6018 x 10 ¹		1.3368 x 10 ⁻¹	5.7870 x 10 ⁻⁴
lb/gal	1.1983 x 10 ⁻¹	1.1983 x 10 ²	7.4805		4.3290 x 10 ⁻³
lb/in ³	2.7680 x 10 ¹	2.7680 x 10 ⁴	1.7280 x 10 ³	2.3100 x 10 ²	

Mass

	g	kg	lb	ton (short)
g		10 ⁻³	2.2046 x 10 ⁻³	1.1023 x 10 ⁻⁶
kg	10 ³		2.2046	1.1023 x 10 ⁻³
lb	4.5359 x 10 ²	4.5359 x 10 ⁻¹		5.0 x 10 ⁻⁴
ton (short)	9.0718 x 10 ⁵	9.0718 x 10 ²	2.0 x 10 ³	

Volume

	liter	m ³	cm ³ (ml)	ft ³	US gal
liter		10 ⁻³	10 ³	3.5315 x 10 ⁻²	2.6418 x 10 ⁻¹
m ³	10 ³		10 ⁶	3.5315 x 10 ¹	2.6418 x 10 ²
cm ³ (ml)	10 ⁻³	10 ⁻⁶		3.5315 x 10 ⁻⁵	2.6418 x 10 ⁻⁴
ft ³	2.8317 x 10 ¹	2.8317 x 10 ⁻²	2.8317 x 10 ⁴		7.4801
US gal	3.7854	3.7854 x 10 ⁻³	3.7854 x 10 ³	1.3368 x 10 ⁻¹	

Temperature

	°C	°F	K
°C		1.8 (°C) + 32	°C + 273.15
°F	(°F - 32) ÷ 1.8		(°F + 459.67) ÷ 1.8
K	K - 273.15	1.8 (K) - 459.67	

Pressure

	atm	psi (lb/in ²)	in of Hg (32°F)	mm of Hg (32°F) (torr)	in of H ₂ O (60°F)	kPa	bar
atm		1.4696 x 10 ¹	2.9921 x 10 ¹	7.60 x 10 ²	4.0719 x 10 ²	1.01325 x 10 ²	1.01325
psi (lb/in ²)	6.8046 x 10 ⁻²		2.0360	5.1715 x 10 ¹	2.7707 x 10 ¹	6.8948	6.8948 x 10 ⁻²
in of Hg (32°F)	3.3421 x 10 ⁻²	4.9115 x 10 ⁻¹		2.54 x 10 ¹	1.3608 x 10 ¹	3.3864	3.3864 x 10 ⁻²
mm of Hg (32°F) (torr)	1.3158 x 10 ⁻³	1.9337 x 10 ⁻²	3.9370 x 10 ⁻²		5.3576 x 10 ⁻¹	1.3332 x 10 ⁻¹	1.3332 x 10 ⁻³
in of H ₂ O (60°F)	2.4582 x 10 ⁻³	3.6092 x 10 ⁻²	7.3484 x 10 ⁻²	1.8665		2.4884 x 10 ⁻¹	2.4884 x 10 ⁻³
kPa	9.8692 x 10 ⁻³	1.4504 x 10 ⁻¹	2.9530 x 10 ⁻¹	7.5008	4.0186		10 ⁻²
bar	9.8692 x 10 ⁻¹	1.4504 x 10 ¹	2.9530 x 10 ¹	7.5008 x 10 ²	4.0186 x 10 ²	10 ²	

Dew Point-Water Vapor Content

Dew Point at 1 atm °F (°C)	Water Vapor ppm (vol/vol)
-130 (-90)	0.10
-120 (-84)	0.25
-110 (-79)	0.63
-105 (-76)	1.00
-104 (-76)	1.08
-103 (-75)	1.18
-102 (-74)	1.29
-101 (-74)	1.40
-100 (-73)	1.53
-99 (-73)	1.66
-98 (-72)	1.81
-97 (-72)	1.96
-96 (-71)	2.15
-95 (-71)	2.35
-94 (-70)	2.54
-93 (-69)	2.76
-92 (-69)	3.00
-91 (-68)	3.28
-90 (-68)	3.53
-89 (-67)	3.84
-88 (-67)	4.15

Dew Point at 1 atm °F (°C)	Water Vapor ppm (vol/vol)
-87 (-66)	4.50
-86 (-66)	4.78
-85 (-65)	5.3
-84 (-64)	5.7
-83 (-64)	6.2
-82 (-63)	6.6
-81 (-63)	7.2
-80 (-62)	7.8
-79 (-62)	8.4
-78 (-61)	9.1
-77 (-61)	9.8
-76 (-60)	10.5
-75 (-59)	11.4
-74 (-59)	12.3
-73 (-58)	13.3
-72 (-58)	14.3
-71 (-57)	15.4
-70 (-57)	16.6
-69 (-56)	17.9
-68 (-56)	19.2
-67 (-55)	20.6

Dew Point at 1 atm °F (°C)	Water Vapor ppm (vol/vol)
-66 (-54)	22.1
-65 (-54)	23.6
-64 (-53)	25.6
-63 (-53)	27.5
-62 (-52)	29.4
-61 (-52)	31.7
-60 (-51)	34.0
-59 (-51)	36.5
-58 (-50)	39.0
-57 (-49)	41.8
-56 (-49)	44.6
-55 (-48)	48.0
-54 (-48)	51
-53 (-47)	55
-52 (-47)	59
-51 (-46)	62
-50 (-46)	67
-49 (-45)	72
-48 (-44)	76
-47 (-44)	82
-46 (-43)	87

To convert a value from the units listed in the vertical column at the left of the table to the units given in the top row, multiply the left hand value by the conversion factor given at the intersection.

Parts Per Million (ppm) to Percent (%):

1 ppm = 0.0001%
10 ppm = 0.001%
100 ppm = 0.01%
1,000 ppm = 0.1%
10,000 ppm = 1.0%

Parts Per Million (ppm) to Parts Per Billion (ppb):

1 ppm = 1,000 ppb
0.1 ppm = 100 ppb
0.01 ppm = 10 ppb
0.001 ppm = 1 ppb

Gas Withdrawal Rates for Liquified Gases

Cylinder Withdrawal Rates

Cylinder withdrawal rates are specified with regard to safety codes and limitations due to certain physical properties of the gases. Recommended cylinder withdrawal rates vary with cylinder size and accordingly affect the manifold design and capacity. Maximum recommended withdrawal rates are listed below. Loss of cylinder pressure will result when withdrawal rates are exceeded.

Maximum Withdrawal Rates @ 70°F

Acetylene (300 cu ft/cylinder)	43 scfh
Propane (100 pounds per cylinder)	100 scfh
APACH Gas (100 pounds/cylinder)	130 scfh
MAPP Gas (70 pounds/cylinder)	100 scfh
Carbon Dioxide (50 pounds/cylinder)	25 scfh
Nitrous Oxide (60 pounds/cylinder)	33 scfh
Propylene (100 pounds/cylinder)	180 scfh

- Ammonia
 - 150 lb (AA) NH₃ cylinder – Max sustainable flowrate = 1.3 lbs/hr
- HCL
 - 65 lbs (A) HCl cylinder – Max sustainable flowrate = 2.3 lbs/hr
 - 60 lbs (B) HCl cylinder – Max sustainable flowrate = 2.2 lbs/hr
 - 600 lbs (Y) HCl cylinder – Max sustainable flowrate = 12 lbs/hr

Acetylene

Acetylene is stored in cylinders containing acetone at a cylinder pressure of 250 psig at 70°F. High flowrates withdraw acetone along with the acetylene gas, resulting in decreased flame temperature and higher consumption.

AA Acetylene

When the head pressure in the acetylene cylinder drops to 70 psi, acetone will enter the gas stream. The cylinder must be changed out or an Atomic Absorption Filter (see AA Filter specifications) must be used to prevent damage to the detector.

Propane

Propane is a liquefied petroleum gas and is maintained in the cylinder in both liquid and gaseous states. The cylinder pressure varies directly with ambient temperature. The cylinder pressure at 70°F is approximately 109 psig. Each pound of propane is equal to 8.67 cubic feet of gaseous propane. The most common propane cylinder size used in

industry contains 100 pounds of propane; therefore, a standard cylinder contains 867 cubic feet of gaseous propane. The ability of a liquid to flash into a gas is determined by the heat transfer through the cylinder wall. The limitation of heat transfer necessitates a gaseous withdrawal limit for a propane cylinder. Good operating practice dictates withdrawal for a 100-pound cylinder to be approximately 100 cubic feet per hour. If the withdrawal rate is excessive, the propane cylinder will lose pressure.

Carbon Dioxide

A standard cylinder contains 50 pounds of liquid carbon dioxide. Each pound is equal to 8.7 cubic feet of gaseous carbon dioxide. At 70°F the cylinder pressure is approximately 837 psig. Because of its physical properties, chilled carbon dioxide expanded across cylinder valve and regulator orifices can cause dry ice formation within these devices which can cause malfunction. Carbon dioxide heaters may be required for high-volume applications to preheat gas entering the regulators. Heaters are listed in the Manifold Accessories section.

Nitrous Oxide

A standard cylinder of nitrous oxide contains 60 pounds of liquid. At 70°F the cylinder pressure is approximately 745 psig. Nitrous oxide produces low temperatures when expanded across cylinder valve and regulator orifices. Heaters may be required for high volume applications. Never heat cylinders with a torch. Nitrous oxide can decompose and explode at temperatures above 1200°F. Heaters are listed in the Manifold Accessories section.

Dewar's (Liquefied Gas Cylinders) Nitrogen

Under ideal conditions (72°F, 50% relative humidity), the maximum attainable delivery rates are:

one cylinder	325 scfh
two cylinders	400 scfh
three cylinders	600 scfh

CO₂ Dewar Withdrawal Rate Limitation

Continuous delivery rates greater than 110 scfh may require an external vaporizer due to a manifold temperature below -20°F.

A cylinder of CO₂ will only produce 25 scfh sustained flow at ambient temperature. A dewar of CO₂ will produce a maximum of 110 scfh.

Line Size/Pressure Drop Chart

Line Size/Pressure Drop Chart

REFERENCE

Description: This chart shows the flow capacity listed in air for various sizes of pipe and tubing. This would need to be converted to the specific gas. See our conversion program under calculators for this.

The pressure drop is not exact as it is for straight runs of pipe or tubing and you need to allow for any change in direction, a typical factor of 50% should be used, and you should allow for future expansion of your gas requirements.

Capacity of Distribution Lines in SCFH (NL/m) of Air @ 60°F (16°C)

Inlet Pressure Psig (bar)	Pressure Drop per 100' (30.4 m) psig (bar)	Line Size					
		1/8"	1/4"	3/8"	1/2"	3/4"	1"
50 (3)	1 (0.07)	20 (9)	180 (84)	405 (191)	760 (358)	1,610 (759)	3,040 (1,433)
	5 (0.3)	49 (24)	400 (188)	910 (429)	1,700 (801)	3,600 (1,687)	6,800 (3,206)
	10 (0.7)	70 (33)	580 (273)	1,300 (613)	2,410 (1,136)	5,100 (2,404)	9,720 (4,582)
100 (7)	1 (0.07)	28 (13)	245 (116)	550 (259)	1,020 (481)	2,160 (1,018)	4,070 (1,919)
	5 (0.3)	65 (31)	545 (257)	1,230 (580)	2,280 (1,075)	4,820 (2,272)	9,100 (4,290)
	10 (0.7)	90 (42)	775 (365)	1,750 (825)	3,240 (1,527)	6,820 (3,215)	12,970 (6,114)
150 (10)	1 (0.07)	32 (15)	290 (137)	660 (311)	1,220 (575)	2,580 (1,216)	4,870 (2,296)
	5 (0.3)	74 (34)	650 (306)	1,470 (693)	2,730 (1,287)	5,775 (2,722)	10,900 (5,138)
	10 (0.7)	110 (52)	930 (438)	2,100 (990)	3,880 (1,829)	8,170 (3,852)	15,540 (7,326)
200 (14)	5 (0.3)	85 (41)	745 (351)	1,680 (792)	3,120 (1,471)	6,590 (3,107)	12,450 (5,869)
	10 (0.7)	125 (59)	1,060 (500)	2,390 (1,127)	4,430 (2,088)	9,330 (4,392)	17,750 (8,368)
300 (21)	5 (0.3)	105 (50)	900 (424)	2,040 (962)	3,780 (1,782)	7,980 (3,762)	15,070 (7,104)
	10 (0.7)	150 (71)	1,280 (605)	2,900 (1,367)	5,370 (2,532)	11,300 (5,327)	21,480 (10,126)
400 (28)	5 (0.3)	125 (59)	1,040 (490)	2,340 (1,103)	4,340 (2,046)	9,160 (4,318)	17,300 (8,156)
	10 (0.7)	175 (83)	1,470 (693)	3,330 (1,570)	6,160 (2,904)	12,970 (6,114)	24,660 (11,625)
500 (35)	5 (0.3)	130 (61)	1,180 (556)	2,660 (1,254)	4,940 (2,329)	10,440 (4,922)	19,700 (9,287)
	10 (0.7)	190 (87)	1,680 (792)	3,790 (1,787)	7,020 (3,309)	14,770 (6,963)	28,100 (13,247)
1,000 (69)	5 (0.3)	190 (90)	2,030 (957)	3,920 (1,848)	7,270 (3,427)	15,360 (7,241)	29,000 (13,671)
	10 (0.7)	270 (127)	2,470 (1,164)	5,580 (2,630)	10,330 (4,870)	21,740 (10,249)	41,300 (19,470)
1,500 (103)	5 (0.3)	230 (108)	2,030 (957)	4,570 (2,154)	8,470 (3,993)	17,900 (8,438)	33,800 (15,934)
	10 (0.7)	330 (156)	2,880 (1,357)	6,500 (3,064)	12,040 (5,676)	25,350 (11,951)	48,200 (22,723)
2,000 (138)	5 (0.3)	265 (125)	2,340 (1,103)	5,270 (2,489)	9,770 (4,606)	20,650 (9,735)	39,000 (18,380)
	10 (0.7)	380 (179)	3,320 (1,565)	7,500 (3,536)	13,890 (6,548)	29,200 (13,766)	55,600 (26,211)
2,500 (172)	5 (0.3)	300 (142)	2,610 (1,230)	5,890 (2,777)	10,920 (5,148)	23,100 (10,890)	43,550 (20,531)
	10 (0.7)	427 (201)	3,710 (1,749)	8,380 (3,950)	15,510 (7,312)	32,650 (15,392)	62,100 (29,276)

Abbreviations & Symbols

Symbol	Chemical Name	Symbol	Chemical Name
Al ₂ O ₃	Aluminum Oxide	CH ₃ SH	Methyl Mercaptan
Ar	Argon	CH ₄	Methane
AsH ₃	Arsine	CHClF ₂	Chlorodifluoromethane (Halocarbon 22)
B ₁₁ F ₃	Boron 11 Trifluoride	CHCl ₂ F	Dichlorofluoromethane (Halocarbon 21)
B ₂ H ₆	Diborane	CHF ₃	Trifluoromethane (Halocarbon 23)
BCl ₃	Boron Trichloride	Cl ₂	Chlorine
BF ₃	Boron Trifluoride	CO	Carbon Monoxide
C ₂ ClF ₅	Chloropentafluoroethane (Halocarbon 115)	CO ₂	Carbon Dioxide
C ₂ Cl ₂ F ₄	1,2-Dichlorotetrafluoroethane (Halocarbon 114)	COCl ₂	Phosgene
C ₂ F ₆	Hexafluoroethane (Halocarbon 116)	COS	Carbonyl Sulfide
C ₂ H ₂	Acetylene	D ₂	Deuterium
C ₂ H ₂ F ₂	1,1-Difluoroethylene (Halocarbon 1132A)	Fe ₂ O ₃	Iron Oxide
C ₂ H ₃ ClF ₂	1-Chloro-1, 1-Difluoroethane (Halocarbon 142B)	H ₂	Hydrogen
C ₂ H ₄	Ethylene	H ₂ O	Water
C ₂ H ₄ F ₂	1,1-Difluoroethane (Halocarbon 152A)	H ₂ S	Hydrogen Sulfide
C ₂ H ₄ O	Ethylene Oxide	H ₂ SiCl ₂	Dichlorosilane
C ₂ H ₅ Cl	Ethyl Chloride	HCl	Hydrogen Chloride
C ₂ H ₆	Ethane	HD	Hydrogen Deuteride
C ₂ H ₆ O	Dimethyl Ether	He	Helium
C ₃ F ₈	Perfluoropropane (Halocarbon 218)	Hg	Mercury
C ₃ H ₄	Allene (Propadiene)	HSiCl ₃	Trichlorosilane
C ₃ H ₆	Propylene	K ₂ O	Potassium Oxide
C ₃ H ₆ O	Propylene Oxide	Kr	Krypton
C ₃ H ₆ O	Vinyl Methyl Ether	MgO	Magnesium Oxide
C ₃ H ₈	Propane	N ₂	Nitrogen
C ₄ F ₈	Octafluorocyclobutane (Halocarbon C-318)	N ₂ O	Nitrous Oxide
C ₄ H ₆	1,3-Butadiene	N ₂ O ₄	Nitrogen Tetroxide
C ₄ H ₆	Ethyl Acetylene	Na ₂ O	Sodium Oxide
C ₄ H ₈	1-Butene	Ne	Neon
C ₄ H ₈	cis-2-Butene	NH ₃	Ammonia
C ₄ H ₈	Isobutylene	NO	Nitric Oxide
C ₄ H ₈	Trans-2-Butene	NO ₂	Nitrogen Dioxide
C ₄ H ₁₀	Butane	O ₂	Oxygen
C ₄ H ₁₀	Isobutane	PF ₅	Phosphorous Pentafluoride
C ₅ H ₁₂	Isopentane	PH ₃	Phosphine
CaO	Calcium Oxide	SF ₆	Sulfur Hexafluoride
CBrF ₃	Bromotrifluoromethane (Halocarbon 13B1)	Si	Silicon
CClF ₃	Chlorotrifluoromethane (Halocarbon 13)	SiCl ₄	Silicon Tetrachloride
CCl ₂ FCClF ₂	1,1,2-Trichloro-1,2,2-Trifluoroethane (Halocarbon 113)	SiF ₄	Silicon Tetrafluoride
CCl ₂ F ₂	Dichlorodifluoromethane (Halocarbon 12)	SiH ₄	Silane
CCl ₃ F	Trichlorofluoromethane (Halocarbon 11)	SiO ₂	Silicon Dioxide
CF ₄	Tetrafluoromethane (Halocarbon 14)	SO ₂	Sulfur Dioxide
CH ₃ Cl	Methyl Chloride	Xe	Xenon

Abbreviations & Symbols Cont.

Symbol		Symbol	
A		G	
Å	Angstrom(s)	g	gram(s)
AA	Atomic Absorption	gal	gallon(s)
abs	absolute	GC	Gas Chromatography or Chromatograph
ACGIH	American Conference of Governmental Industrial Hygienists	GMIS	Gas Manufacturers Intermediate Standard
ASTM	American Society for Testing Materials	GPA	Gas Processors Association
atm	atmosphere(s)	H	
avg	average	Hall	Electrolytic Conductivity Detector
B		HAP	Hazardous Air Pollutants
bp	boiling point	HID	Helium Ionization Detector
Btu	British thermal unit(s)	hr	hour
C		Hz	hertz
CAA	Clean Air Act	I	
cal	calorie(s)	ICP	Inductively Coupled Plasma (Spectroscopy)
CAS	Chemical Abstract Services	ID	Identification or inside diameter
ccm	cubic centimeter(s) per minute	in, ins	inch(es)
ccs	cubic centimeter(s) per second	in ³ , cu in	cubic inch(es)
CEM	Continuous Emission Monitor	J	
cf	cubic feet	J	joule
CFCs	Chlorofluorocarbons	K	
CFR	Code of Federal Regulations	K	Kelvin
CGA	Compressed Gas Association	kg	kilogram(s)
cm	centimeter(s)	kPa	Kilo pascal(s)
cm ²	square centimeter	°K	degree(s) Kelvin
cm ³ , cc	cubic centimeter	L	
COA	Certificate of Analysis	L	liter(s)
COC	Certificate of Conformance	lb	pound(s)
CP	Chemically Pure	LC	Liquid Chromatography
Cp	specific heat at constant pressure	Lpm	liters per minute
Cv	specific heat at constant volume	M	
Cv	coefficient of flow	μ	micron(s), 10-5m
°C	degree(s) Celsius	m ³	cubic meter(s)
D		mA	milliampere
DID	Discharge Ionization Detector	max	maximum
DIN	Deutsche Industrie Normen (German Industrial Standards)	mg	milligram(s)
DISS	Diameter Index Safety System	min	minute(s)
DOT	Department of Transportation	ml	milliliter(s)
E		mm	millimeter(s)
ea	each	MNPT	Male National Pipe Thread
ECD	Electron Capture Detector	mol.wt.	molecular weight
EPA	Environmental Protection Agency	MOS	Metal Oxide Semiconductor
F		MW	molecular weight
°F	degree(s) Fahrenheit	mp	melting point
FID	Flame Ionization Detector	MS	Mass Spectrometry
FNPT	Female National Pipe Thread	MSD	Mass Selective Detector
F.O.B.	Freight on Board	MVCR	Male VCR
FPD	Flame Photometric Detector	MVFS	Male Vacuum Face Seal
ft	foot, feet	N	
ft ³ , cu ft	Cubic foot (feet)	N/A	not applicable
FTIR	Fourier Transform Infrared Spectrometer or Spectroscopy	nbp	normal boiling point
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act	NDIR	Non-Dispersive Infrared Analyzer

Abbreviations & Symbols Cont.

Symbol	Symbol		
NDUV	Non-Dispersive Ultraviolet Analyzer	S	
NER	normal evaporation rate	SCC	standard cubic centimeters
NF	National Formulary	sccm	standard cubic centimeters per minute
NFPA	National Fire Protection Association	scgs	standard cubic centimeters per second
NIST	National Institute of Standards and Technology	scfh	standard cubic feet per hour
nm	nanometer(s)	scfm	standard cubic feet per minute
No	number	scfs	standard cubic feet per second
nom	nominal	sec	second(s)
NOS	not otherwise specified	SFC	Supercritical Fluid Chromatography
NPD	Nitrogen/Phosphorous Detector	SFE	Supercritical Fluid Extraction
NPT	National Pipe Thread	slpm	standard liters per minute
NTP	Normal temperature and pressure	sp. gr.	specific gravity
NTRM	NIST Traceable Reference Material	sp. vol.	specific volume
NMR	Nuclear Magnetic Resonance Spectroscopy	SRM	Standard Reference Materials
O		SS	Stainless Steel
OD	outside diameter	Stn. Stl.	Stainless Steel
Ohm-cm	ohms centimeter	STEL	Short Term Exposure Limit
OSHA	Occupational Safety and Health Administration	STP	standard temperature and pressure
oz	ounce(s)	T	
P		TCD	Thermal Conductivity Detector
Pa	pascal(s)	TEA	Transversely Excited Atmosphere
PID	Photo Ionization Detector	THC	Total Hydrocarbon Content
ppb	part(s) per billion	TLV	Threshold Limit Value
ppba	part(s) per billion atomic	tp	triple point
ppbv	part(s) per billion by volume	TPH	Total Petroleum Hydrocarbons
ppbw	part(s) per billion by weight	TWA	Time Weighted Average
ppm	part(s) per million	U	
ppma	part(s) per million atomic	UHP	Ultra High Purity
ppmv	part(s) per million by volume	UN	United Nations
ppmw	part(s) per million by weight	USP	United States Pharmacopoeia
ppt	parts(s) per trillion	UPC	Ultra Pure Carrier
ppta	Parts(s) per trillion atomic	V	
pptv	Parts(s) per trillion by volume	VAC	volts alternating current
pptw	Parts(s) per trillion by weight	VDC	volts direct current
psi	pound(s)-force per square inch	VOC	Volatile Organic Compounds
psia	pound(s)-force per square inch absolute	Vol	volume
psig	pound(s)-force per square inch gauge	Vol%	volume percent
R		W	
Ra	Roughness average	w.c.	water column pressure
RFO	restricted flow orifice	wt.	weight
°R	degree(s) Rankine	wt%	weight percent
		wt. ppm	weight parts per million
		Y	
		yd	yard(s)
		>	greater than
		<	less than

Glossary

A

ABSOLUTE PRESSURE – Pressure measured with respect to total vacuum. Equal to the sum of a pressure gauge reading and atmospheric pressure.

ABSOLUTE ZERO – The minimum point in thermodynamic temperature scale (-273.16°C or -459.69°F).

ABSORPTION – The penetration of matter in bulk into other matter, as in the dissolving of a gas in liquid.

ACCURACY – The degree of agreement of a measured value with the true or expected value of the quantity of concern.

ADSORPTION – Adherence of the atoms, ions or molecules of a gas or liquid to the surface of another substance, called the adsorbent. Molecular sieves are adsorbents.

AEROBIC MIXTURE – A biological atmospheric gas mixture, containing Oxygen, used as a controlled atmosphere for the growth of aerobic bacteria.

ACGIH (AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS) – This Conference is a professional society, not an official Government agency. It is an organization devoted to the development of administrative and technical aspects of worker protection.

ANAEROBIC MIXTURE – A biological atmospheric gas mixture, oxygen free, used as a controlled atmosphere for the growth of anaerobic bacteria.

ANALYTICAL ACCURACY – Guaranteed accuracy of reported analytical result.

ANHYDROUS – A descriptive term meaning without water (ie: anhydrous ammonia).

ANNEALING GAS – A hydrogen and nitrogen mixture used to provide a reducing atmosphere during heating of metals to render them less brittle on cooling.

ASPHYXIAN GAS – A gas which has little or no positive toxic effect but which can bring about unconsciousness and death by replacing air and thus depriving an organism of oxygen.

ATTACHED POPPET (TIED-SEAT; TIED-DIAPHRAGM) – A feature of certain regulators whereby the stem (poppet) is physically attached to the diaphragm.

ATMOSPHERIC PRESSURE – The amount of force exerted by the Earth's atmosphere. Equal to 14.7 psia or 0 psig.

AA (ATOMIC ABSORPTION) – An analytical instrumental method that is normally used to measure metal concentrations.

ATOMIC WEIGHT – The relative weight of an atom of an element, compared to carbon-12. Equivalent to the sum of protons and neutrons in the nucleus.

AUTOIGNITION TEMPERATURE – The minimum temperature for a material to ignite without an external ignition source.

AZEOTROPIC MIXTURE (AZEOTROPE) – A liquid mixture of two or more substances which behaves like a single substance in that the vapor produced by partial evaporation of liquid has the same composition as the liquid. The constant boiling mixture exhibits either a maximum or minimum boiling point as compared with that of other mixtures of the same substances.

B

BACK-PRESSURE REGULATOR – A pressure regulator which controls upstream (inlet) pressure. Similar in function to a relief valve.

BALANCED POPPET (BALANCED VALVE; BALANCED STEM) – A valve which has been designed to be pressure balanced; hence the valve spring provides the shutoff force. Used essentially to reduce or minimize decaying inlet pressure effect.

BIOLOGICAL ATMOSPHERE GASES – Mixtures, usually of air or oxygen with varying amounts of carbon dioxide, for growth of biological cultures. If oxygen is present it is Aerobic, if not it is Anaerobic.

BLEND – See "MIXTURES."

BOILING POINT – The temperature at which the vapor pressure of the liquid is equal to the prevailing pressure of the atmosphere. The normal boiling point is the temperature at which the vapor pressure of the liquid is 14.7 psia (1 atm).

BONNET (SPRING HOUSING) – The part of a regulator which houses the control spring.

BRASS – copper/zinc alloys of varying composition. Some brass also contains low percentages of other elements such as manganese, aluminum, silicon, lead and tin.

BTU (BRITISH THERMAL UNIT) – The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near its point of maximum density (39.1°F).

BURSTING DISK (FRANGIBLE DISK) – A metal disk which is part of a safety device, and which is intended to burst and allow gas to escape within predetermined pressure limits to prevent rupture of the device it is installed on. Similar in function to a safety relief valve, except it has no reseal capability.

BURST PRESSURE – A design test pressure which allows for permanent deformation and leakage, but parts must remain assembled (i.e., no sudden ruptures). Normal industry standard is 4 times (400%) of maximum operating pressure. See also "PROOF PRESSURE" and "MAXIMUM OPERATING PRESSURE."

C

CP (CHEMICALLY PURE) – Denotes a high purity gas, but the actual % purity will depend on the particular gas.

CALIBRATION – Comparison of a measurement standard or instrument with another standard or instrument to report or eliminate by adjustment any variation (deviation) in the accuracy of the item being compared.

CALIBRATION GAS – A gas or gas mixture of accurately known composition used as a comparative standard in analytical instrumentation.

CALORIE – The amount of heat required to raise the temperature of one gram of water one degree Celsius.

CARRIER GAS – Gas used with gas chromatography to carry the sample through the system.

CATALYST – A substance that initiates a chemical reaction and allows it to proceed under different conditions than otherwise possible.

CERTIFIED MIXTURE – A mixture whose concentration is determined by analysis and comparison with a Primary Standard of NIST reference material.

CGA NUMBER – Cylinder/container valve outlet connection number assigned by the Compressed Gas Association. CGA numbers are detailed in CGA Standard V-1.

CHECK VALVE – A mechanical device that allows flow of gas in only one predetermined direction, to prevent backflow of gas or contaminants.

CAS (CHEMICAL ABSTRACT SERVICES) – CAS numbers represent chemical substances recorded in the CAS Chemical Registry System. This numbering system identifies chemical substances by an unambiguous computer language description of its molecular structure, including all stereochemical detail. The CAS number, which has no chemical significance, is simply a number assigned in sequential order to each substance as it enters the Registry System. All specific substances reported in the world's scientific and technical literature, and indexed in Chemical Abstracts (CA) since 1965 (when the Registry System began), are included in this master file.

CHEMILUMINESCENCE – A species which chemically absorbs and emits light (usually at low temperatures).

CHROMATOGRAM – The record produced by the gas or liquid chromatograph. It is also a measure of instrument performance.

COEFFICIENT OF FLOW (Cv) – Defined as the actual flow performance in U.S. gallons of water per minute at 60°F when inlet pressure (P1) is 1 psig and outlet pressure (P2) is atmospheric (14.7 psia).

COLUMN – Part of the gas chromatography system where the separation of the sample takes place (can be packed or capillary).

COMBUSTION – An exothermic oxidation reaction which may occur with any organic compound, as well as with certain elements.

COMPRESSED GAS – (1) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F; or (2) a gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F, regardless of the pressure at 70°F; or (3) a liquid flammable material having a vapor pressure exceeding 40 psi at 100°F as determined by ASTM D-323-72.

CGA (COMPRESSED GAS ASSOCIATION) – This is a nonprofit technical association whose membership includes many corporations active in all phases of the compressed gas industry. Founded in 1913, the CGA uses the experience and knowledge of its members to promote industrywide standards and procedures for safety in the manufacture, storage, transport, and use of compressed gases.

CORROSIVE – The ability of a chemical compound to attack, and produce irreversible damage to, human tissues, such as eyes, skin or mucous membranes. Also, the ability of a chemical compound to attack and eat away rubber, metal and other substances.

CRACKING PRESSURE – A term used in back pressure control only (e.g., back pressure regulators, relief valves), for determining the inlet pressure at which flow starts.

CREEP – Any increase in outlet pressure of a pressure regulator subsequent to lockup, usually seen as a long term, slow pressure increase. This generally indicates a seat leak, which is an abnormal condition.

CRITICAL DENSITY – The density of a pure material at its critical temperature and critical pressure.

CRITICAL POINT – The transition point at which the liquid and gaseous states of a substance merge into each other. It is the temperature above which a substance cannot exist in two phases, no

matter how great the pressure. See also “CRITICAL TEMPERATURE” and “CRITICAL PRESSURE.”

CRITICAL PRESSURE – At the “CRITICAL TEMPERATURE,” the highest pressure at which a pure material can exist as a gas in equilibrium with its liquid.

CRITICAL TEMPERATURE – The temperature above which a gas cannot be liquefied by pressure alone. At this temperature, there is no distinction between liquid and vapor, both having the same density and constituting one homogenous system.

CRYOGENIC LIQUID – A liquid having a normal boiling point below -240°F (-151.11°C)

CRYOGENIC LIQUID CONTAINER – An insulated container designed to store, handle, and transport liquids having boiling points below -130°F.

CYLINDER – A container designed to hold compressed gases or liquefied compressed gases. Cylinders are manufactured and tested according to DOT/CTC/MEX specifications.

D

DEHYDRATION – Removal of one or more molecules of water from a chemical compound.

DELAYED (CHRONIC) HEALTH HAZARD – See “EPA HAZARD CATEGORIES.”

DELIVERY PRESSURE – See “OUTLET PRESSURE.”

DENSITY – The ratio of the amount of anything per unit volume; e.g., mass of any substance per unit volume at any definite temperature. It is usually expressed in pounds per cubic foot (lbs/ft³). See also “SPECIFIC GRAVITY.”

DEPARTMENT OF TRANSPORTATION (DOT) – This is a government agency whose Title 49, Code of Federal Regulations, regulates the transport of hazardous materials.

DEVICE GAS MIXTURE – A gas mixture that is used for the calibration of medical diagnostic equipment. The gas may enter the body, but its action is not dependent upon its being metabolized.

DEWAR – Vessel which contains cryogenic liquefied gases.

DEW POINT – The temperature at which the liquefaction of vapor begins; the term is usually applied to condensation of moisture from the water vapor in the atmosphere.

DISS (DIAMETER INDEX SAFETY SYSTEM) – DISS outlet valves are generally used with high-purity products, toxics, and corrosives. Valves equipped with DISS outlet assignment provide a metal-to-metal seal that creates low particle generation, a permeation-free environment, and good leak integrity.

DIAPHRAGM VALVE – Packless valve using a metal diaphragm to prevent leakage of gas through the valve stem. There is no direct connection between the hand wheel and the valve stem.

DIP TUBE – See “EDUCTOR TUBE.”

DOPANT – An impurity usually added in small amounts to a pure substance to alter its properties.

DOT ID NUMBERS – These are product identification numbers, assigned by the Department of Transportation (DOT) to assist members of fire and police departments in using the DOT Emergency Response Guidebook. DOT ID numbers contain two letters followed by four digits. The prefix UN (for United Nations) identifies products recognized throughout the world. Gaseous nitrogen, for example, is identified as UN 1066.

DROOP – The decrease in outlet set pressure of a pressure regulator which results from an increase in flow rate. Essentially the reverse of lockup. See also “LOCKUP.”

DRUG GAS – A gas or gas mixture that is inhaled and has a physiological effect upon the body.

E

ECD (ELECTRON CAPTURE DETECTOR) – A gas chromatography detector that is very sensitive to halogen-containing compounds. Uses P-5, nitrogen or helium.

EDUCTOR (LIQUID DELIVERY) TUBE – A tube inside a cylinder or container attached to the cylinder valve which allows liquid product withdrawal from the cylinder.

EFFLUENT SPLITTER – The part of the analytical instrument that splits the effluent stream into multiple detectors or some to vent for a lower volume of effluent.

EPA (ENVIRONMENTAL PROTECTION AGENCY) – This is a government agency that establishes environmental standards within the United States.

EPA HAZARD CATEGORIES – The hazard categories used throughout this manual as defined under EPA SARA Title III and 1910.1200 of Title 29 of the Code of Federal Regulations are as follows:

- Immediate (Acute) Health Hazard, including highly toxic, corrosive, toxic, irritant, sensitizer, and other hazardous chemicals which cause an adverse effect to a target organ, and manifest themselves within a short period of time following a one time, high exposure to the substance.

- Delayed (Chronic) Health Hazard, including carcinogens and other hazardous chemicals which cause an adverse effect to a target organ and manifest themselves after a long period of time following or during repeated contacts with the substance.
- Fire Hazard, including flammable, combustible pyrophoric, and oxidizer.
- Sudden Release of Pressure Hazard, including explosive and compressed gas.
- Reactive Hazard, including unstable reactive, organic peroxide, and water reactive.

EPA PROTOCOL GASES – Gas mixtures used for the calibration of stationary source continuous emission monitors (CEMs). The mixtures are manufactured according to procedures laid down by the EPA and are traceable to NIST SRMs.

EXPOSURE LIMITS – Concentrations of substances (and conditions) under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. “ACGIH” limits are called “TLV” and “OSHA” exposure limits are called “PEL.” See “THRESHOLD LIMIT VALUE.”

F

FID DETECTOR – FLAME IONIZATION DETECTOR – A gas chromatography detector that looks for substances that can be ionized in a flame. Commonly uses helium, hydrogen, and air.

FILLING DENSITY – The percent ratio of the weight of liquified compressed gas in a container to the weight of water that the container will hold at 60°F.

FIRE HAZARD – See “EPA HAZARD CATEGORIES.”

FLAME PHOTOMETRY – An instrument utilizing a flame for the analysis of metals, particularly in medical applications. Usually uses propane or methane.

FLAMMABLE GAS – (1) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13% by volume or less; or (2) a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.

FLAMMABLE LIMITS – The concentration of flammable vapor in air, oxygen, or other oxidants that will propagate flame upon contact when provided with a source of ignition. The lower explosive limit (LEL) is the concentration below which a flame will not propagate; the upper explosive limit (UEL) is the concentration above which a flame will not propagate. A change in temperature or pressure may alter the flammable limits.

FLAMMABLE RANGE – The range over which a gas at normal temperature and pressure will form a flammable mixture with air.

FLASH POINT – The lowest temperature at which a flammable liquid will give off enough vapor at or near its surface to form an ignitable mixture with air.

FLOW CAPACITY – The maximum flow capability of a control device established at a specific set of conditions.

FLOWMETER – An instrument used to measure flow rate. Measurement is either by a floating ball (Rotameter) or by heat transfer (Mass Flowmeter).

FLUID – Any material or substance that changes shape uniformly in response to an external force imposed upon it. The term applies to liquids, gases, and finely divided solids.

FREEZING POINT – The temperature at which a liquid solidifies. It is the temperature at which the liquid and solid states of a substance are in equilibrium at a given pressure.

G

GMIS (GAS MANUFACTURER'S INTERMEDIATE STANDARD) – An internal standard, directly traceable to a NIST SRM, used in the certification of mixtures.

GROSS WEIGHT – The weight of a package plus the weight of its contents.

H

HALOCARBONS – Any hydrocarbon combined with any of the five (F₂, Cl₂, Br, I, At) elements in the VIIA group of the periodic table.

HEAT OF ADSORPTION – The total heat involved in the adsorption process from zero adsorbate loading to some final adsorbate loading at a constant temperature (also called isothermal integral heat of adsorption).

HEAT OF FUSION – The heat energy required to transform one MOLE of substance from the liquid phase to the vapor phase at one atmosphere of pressure.

HYDROCARBON – An organic compound containing carbon and hydrogen.

I

I/M GASES – Calibration gas mixtures used for testing of mobile source emissions. Typically they contain CO, CO₂, Propane, and NO, are traceable to NIST SRMs.

IMMEDIATE (ACUTE) HEALTH HAZARD – See “EPA HAZARD CATEGORIES.”

INERT – A material which, under normal temperatures and pressures, does not react with other materials.

IR (INFRARED) – An area of the spectrum at longer wavelength than red light. Used in analysis as certain compounds absorb Infrared light at characteristic wavelengths.

INHIBITOR – A compound (usually organic) that retards or stops an undesired chemical reaction such as corrosion, oxidation or polymerization.

INLET PRESSURE (P1; SUPPLY PRESSURE; UPSTREAM PRESSURE) – The pressure of the fluid to the supply connection of a control device.

INORGANIC SUBSTANCE – Substances that do not contain carbon in their chemical structure.

IRRITANT – The ability of a chemical, which is not corrosive, to cause a reversible inflammatory effect on living tissue by chemical action at the site of contact.

ISOTHERMAL INTEGRAL HEAT OF ADSORPTION – See “HEAT OF ADSORPTION.”

ISOTOPES – Forms of an element that differ from one another in the mass of their atoms and in the properties dependent on that mass. Having the same atomic number and the same number of valence electrons, isotopes occupy the same position in the periodic table and have identical properties. They are distinguishable only by the small differences in atomic weight or by radioactive transformations.

K

KELVIN (K) – A unit of temperature related to the triple point of water.

L

LIQUEFIED COMPRESSED GAS – A gas which, under the charged pressure, is partially liquid at a temperature of 70°F (21.1°C).

LIQUID DENSITY – The ratio of the mass of a liquid per unit volume at any definite temperature. It is usually expressed in pounds per gallon or pounds per cubic foot.

LOCKUP – The increase in outlet pressure of a pressure regulator that occurs when flow is stopped. Essentially the reverse of DROOP.

LEL (LOWER EXPLOSIVE LIMIT) – The minimum percent by volume of a gas which, when mixed with air at normal temperature and pressure, will form a flammable mixture. See “FLAMMABLE GAS.”

M

MANIFOLD – A series of connectors to a common outlet allowing several cylinders to be used simultaneously.

MSDS (MATERIAL SAFETY DATA SHEET) – An MSDS is a substance fact sheet containing characteristics and hazards of specific hazardous industrial material. Also, these data sheets provide precautionary information on safe handling of the material, as well as emergency and first aid procedures.

MAXIMUM OPERATING PRESSURE – The maximum allowable use pressure for which a system is designed. Also referred to as “WORKING PRESSURE.”

MELTING POINT – The temperature at which the solid and liquid phase of a substance are in equilibrium (normally specified at one atm).

METERING VALVE – A valve capable of accurately controlling the flow of a gas. Usually a needle valve.

MICRON – One millionth of a meter.

MIXTURE – Any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

MOLE – The weight of a substance equal numerically to its molecular weight. A gram-mole is the weight in grams equal to the molecular weight; a pound-mole is the weight in pounds equal to the molecular weight.

MOLECULAR WEIGHT – The sum of the atomic weights of all the constituent atoms in the molecule of an element or a compound.

N

NANOGRAM (ng) – One billionth of a gram (10^{-9}).

NANOMETER (m) – One billionth of a meter (10^{-9}).

NF (NATIONAL FORMULARY) – A supplement to the United States Pharmacopoeia.

NEEDLE VALVE – Valve using a needle-shaped stem moving into and closing a small orifice. Accurately meters flow.

NIST (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY) – Government organization that supplies Standard Reference Materials – “THE NATIONAL STANDARD.”

NTRM (NIST TRACEABLE REFERENCE MATERIAL) – A standard produced by a gas manufacturer and certified by NIST. Considered by NIST and EPA to be equivalent to an SRM.

NO_x – General symbol for Oxides of Nitrogen. Can include Nitric Oxide, Nitrogen Dioxide and Nitrogen Trioxide.

NON-LIQUEFIED GAS – A substance that exists entirely as a gas at 70°F.

NORMAL BOILING POINT (nbp) – The temperature at which the vapor pressure of a liquid reaches 760 mm of mercury.

NORMAL EVAPORATION RATE (NER) – The degree of product loss from a cryogenic liquid container due to heat leak into the container as designed. The NER is checked by measuring the amount of product loss over a specified time and serves to confirm whether the insulation is still effective.

NORMAL TEMPERATURE AND PRESSURE (NTP) – A gas industry reference base. Normal temperature is 70°F. Normal pressure is one atmosphere, or 14.696 psia.

O

OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION) – An organization within the U.S. Department of Labor which sets standards for employers to ensure safe and healthful working conditions for employees.

OUTLET PRESSURE (P₂; DELIVERY PRESSURE; DOWNSTREAM PRESSURE) – The pressure of the fluid from the discharge connection of a control device.

OXIDIZING AGENT – A chemical reagent which causes oxidation of other substances and is thereby reduced.

P

PACKED VALVE – A valve that relies on a compressed packing to prevent leakage of gas between the valve stem and body.

PACKLESS VALVE – A valve that uses a metal seal, such as a diaphragm, to seal the body from the valve stem and prevent any gas leakage.

PARTIAL PRESSURE – In any gas mixture the total pressure is equal to the sum of the pressures (partial) which each gas would exert were it alone in the volume occupied by the “MIXTURE.”

PEL (PERMISSIBLE EXPOSURE LIMITS) – See “EXPOSURE LIMIT.”

PHYSICAL HAZARD – Descriptive of a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable reactive or water reactive.

POISON – A substance that in relatively small doses has an action, when it is ingested by, injected into, inhaled or absorbed by, or applied to a living organism, that either destroys life or impairs seriously the function of one or more organs or tissues.

POLYMERIZATION – A chemical reaction, usually carried out with a catalyst, heat or light, and often under high pressure, in which a large number of relatively simple molecules combine to form a chain-like macromolecule.

ppb (PARTS PER BILLION) – Equal to 0.0000001%.

ppm (PARTS PER MILLION) – A convenient means for expressing low concentrations. As applied to gases, ppm stands for moles per million moles. ppm by weight is expressed as pounds per million pounds. ppm by volume is usually expressed in cubic feet per million cubic feet. Equal to 0.00001%.

PRIMARY STANDARD – A standard whose concentration can be traced directly to a fundamental unit of measurement such as mass. Standard of highest accuracy and precision.

PROOF PRESSURE – A test pressure applied to control devices to verify structural integrity. No deformation or excessive leakage is permitted at this pressure and the control device must function normally subsequent to this test. Normal industry standard is 1.5 times (150%) of “WORKING PRESSURE.” See also “BURST PRESSURE” and “MAXIMUM OPERATING PRESSURE.”

PURGE – Flushing of cylinders, manifolds or other equipment with an inert gas to remove contamination or residue. Purging improves efficiency of the process.

PYROPHORIC – The ability of a chemical to ignite spontaneously in air at a temperature of 130°F or below.

PYROPHORIC GAS – A gas that can spontaneously self-ignite when exposed to normal atmospheric conditions.

R

RARE GAS – Refers to those constituents of air which comprise less than 1% of air and are generally considered inert, such as argon, helium, krypton, neon and xenon.

REACTIVE HAZARD – See “EPA HAZARD.”

REFERENCE GAS – A gas or gas mixture with precisely defined composition used as a reference standard in instrumental analysis.

RELIEF VALVE – A type of pressure relief device which is designed to relieve excessive pressure, and to reclose and reseal, to prevent further flow of gas from the cylinder after reseating pressure has been achieved.

RFO (RESTRICTIVE FLOW ORIFICE) – A safety device placed in the outlet of a cylinder valve intended to limit the release rate of a hazardous gas to a maximum specified range in the event of the inadvertent opening of the valve or the failure of the system downstream of the valve outlet.

ROTAMETER – See “FLOWMETER.”

S

SAFETY RELIEF DEVICE – A safety device usually incorporated in a cylinder valve and actuated by excessive pressure or temperature, or both, at predetermined limits to avoid failure of the pressure vessel.

SELF-RELIEVING (SELF-VENTING) – A feature incorporated in certain pressure reducing regulators which enables the unit to relieve the outlet pressure when adjusted in the decrease direction.

SENSITIZER – The ability of a chemical to cause a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

STEL (SHORT TERM EXPOSURE LIMIT) – See “THRESHOLD LIMIT VALUE – SHORT TERM EXPOSURE LIMIT.”

SUPPLY PRESSURE – See “INLET PRESSURE.”

SKIN – The skin designation, used with the terms TLV-TWA and OSHA-PEL, indicates that cutaneous absorption may contribute to the overall exposure.

SOLVENT – A substance capable of dissolving another substance (solute) to form a uniformly dispersed mixture (solution) at the molecular or ionic size level.

SPAN GAS – Gases which are used as a reference point to span an analyzer.

SPECIFIC GRAVITY (Sp. Gr.) – The ratio of the weight of one substance compared to the weight of an equal volume of another substance which is used as a standard. Usually gases are compared to air (air = 1) while liquids and solids are compared to water ($H_2O = 1$).

SPECIFIC HEAT – Amount of heat required to raise a unit mass of a substance one degree of temperature at either constant pressure (Cp) or constant volume (Cv).

SPECIFIC HEAT RATIO – The ratio of “SPECIFIC HEAT” at constant pressure ($0^\circ C$) to the specific heat at constant volume (Cv).

SPECIFIC VOLUME (Sp. Vol.) – Volume occupied by a unit mass of a substance at a given temperature. It is usually expressed in cubic feet per pound or gallons per pound.

SPRING HOUSING – See “BONNET.”

SRM (STANDARD REFERENCE MATERIAL) – A national standard produced by NIST. The highest level of standard available.

STAINLESS STEEL – Alloy steels containing high percentages of chromium, from less than 10% to more than 25%.

STP (STANDARD TEMPERATURE AND PRESSURE) – An internationally accepted reference base. Standard temperature is $0^\circ C$. Standard pressure is one atmosphere or 14.6960 psia.

SUBLIMATION – The direct passage of a substance from solid to vapor without appearing in the intermediate (liquid) state. An example is solid carbon dioxide (dry ice) which vaporizes at room temperature.

SUDDEN RELEASE OF PRESSURE HAZARD – See “EPA HAZARD CATEGORIES.”

SUCK BACK – The reverse flow of gas or liquid. Usually refers to the back flow of liquid into a gas cylinder.

T

TARE WEIGHT – The weight of an empty cylinder without cap and valve.

TLV (THRESHOLD LIMIT VALUE) – TLVs are measures of toxicity established by the ACGIH. The TLV of a substance refers, in general, to airborne concentrations at or below which nearly all workers may be repeatedly exposed without adverse effect.

THRESHOLD LIMIT VALUE – CEILING (TLV-CEILING) – Refers to an airborne concentration that should not be exceeded, even instantaneously.

TLV-STEL (THRESHOLD LIMIT VALUE – SHORT TERM EXPOSURE LIMIT) – Refers to a 15-minute time-weighted average exposure which should not be exceeded at any time during a workday, even if the time-weighted average is within the TLV. It supplements the 8-hour TLV-TWA for certain substances that produce acute effects on high, short-term exposure.

TLV-TWA (THRESHOLD LIMIT VALUE – TIME WEIGHTED AVERAGE) – Refers to the time-weighted average concentration for a normal 8 hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

TIED-DIAPHRAGM – See “ATTACHED POPPET.”

TIED-SEAT – See “ATTACHED POPPET.”

THC (TOTAL HYDROCARBON CONTENT) – THC is used to describe the quantity of the hydrocarbon impurities present. Usually expressed as methane equivalents.

TOXIC – A substance that has the ability to produce injurious or lethal effects through its chemical interaction with the body.

TRIPLE POINT (tp) – The definite temperature and pressure for a pure substance at which the three phases (solid, liquid, and vapor) coexist in equilibrium as an invariant system.

U

UN (UNITED NATIONS) – See “DOT ID NUMBERS.”

USP (UNITED STATES PHARMACOPOEIA) – The official publication for drug product standards.

UNSTABLE REACTIVE – The ability of a chemical in the pure state, or as produced or transported, to vigorously polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure or temperature.

UPSTREAM PRESSURE – See “INLET PRESSURE.”

V

VAPOR PRESSURE – The pressure characteristic at any given temperature of a vapor in equilibrium with its liquid or solid form.

W

WATER REACTIVE – The ability of a chemical to react with water to release a gas that is either flammable or presents a health hazard.

WORKING PRESSURE – See “MAXIMUM OPERATING PRESSURE.”

Z

ZERO GAS – Gases which are used as a reference point to “zero” an analyzer.

Glossary

A

ABSOLUTE PRESSURE – Pressure measured with respect to total vacuum. Equal to the sum of a pressure gauge reading and atmospheric pressure.

ABSOLUTE ZERO – The minimum point in thermodynamic temperature scale (-273.16°C or -459.69°F).

ABSORPTION – The penetration of matter in bulk into other matter, as in the dissolving of a gas in liquid.

ACCURACY – The degree of agreement of a measured value with the true or expected value of the quantity of concern.

ADSORPTION – Adherence of the atoms, ions or molecules of a gas or liquid to the surface of another substance, called the adsorbent. Molecular sieves are adsorbents.

AEROBIC MIXTURE – A biological atmospheric gas mixture, containing Oxygen, used as a controlled atmosphere for the growth of aerobic bacteria.

ACGIH (AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS) – This Conference is a professional society, not an official Government agency. It is an organization devoted to the development of administrative and technical aspects of worker protection.

ANAEROBIC MIXTURE – A biological atmospheric gas mixture, oxygen free, used as a controlled atmosphere for the growth of anaerobic bacteria.

ANALYTICAL ACCURACY – Guaranteed accuracy of reported analytical result.

ANHYDROUS – A descriptive term meaning without water (ie: anhydrous ammonia).

ANNEALING GAS – A hydrogen and nitrogen mixture used to provide a reducing atmosphere during heating of metals to render them less brittle on cooling.

ASPHYXIAN GAS – A gas which has little or no positive toxic effect but which can bring about unconsciousness and death by replacing air and thus depriving an organism of oxygen.

ATTACHED POPPET (TIED-SEAT; TIED-DIAPHRAGM) – A feature of certain regulators whereby the stem (poppet) is physically attached to the diaphragm.

ATMOSPHERIC PRESSURE – The amount of force exerted by the Earth's atmosphere. Equal to 14.7 psia or 0 psig.

AA (ATOMIC ABSORPTION) – An analytical instrumental method that is normally used to measure metal concentrations.

ATOMIC WEIGHT – The relative weight of an atom of an element, compared to carbon-12. Equivalent to the sum of protons and neutrons in the nucleus.

AUTOIGNITION TEMPERATURE – The minimum temperature for a material to ignite without an external ignition source.

AZEOTROPIC MIXTURE (AZEOTROPE) – A liquid mixture of two or more substances which behaves like a single substance in that the vapor produced by partial evaporation of liquid has the same composition as the liquid. The constant boiling mixture exhibits either a maximum or minimum boiling point as compared with that of other mixtures of the same substances.

B

BACK-PRESSURE REGULATOR – A pressure regulator which controls upstream (inlet) pressure. Similar in function to a relief valve.

BALANCED POPPET (BALANCED VALVE; BALANCED STEM) – A valve which has been designed to be pressure balanced; hence the valve spring provides the shutoff force. Used essentially to reduce or minimize decaying inlet pressure effect.

BIOLOGICAL ATMOSPHERE GASES – Mixtures, usually of air or oxygen with varying amounts of carbon dioxide, for growth of biological cultures. If oxygen is present it is Aerobic, if not it is Anaerobic.

BLEND – See "MIXTURES."

BOILING POINT – The temperature at which the vapor pressure of the liquid is equal to the prevailing pressure of the atmosphere. The normal boiling point is the temperature at which the vapor pressure of the liquid is 14.7 psia (1 atm).

BONNET (SPRING HOUSING) – The part of a regulator which houses the control spring.

BRASS – copper/zinc alloys of varying composition. Some brass also contains low percentages of other elements such as manganese, aluminum, silicon, lead and tin.

BTU (BRITISH THERMAL UNIT) – The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near its point of maximum density (39.1°F).

BURSTING DISK (FRANGIBLE DISK) – A metal disk which is part of a safety device, and which is intended to burst and allow gas to escape within predetermined pressure limits to prevent rupture of the device it is installed on. Similar in function to a safety relief valve, except it has no reseal capability.

BURST PRESSURE – A design test pressure which allows for permanent deformation and leakage, but parts must remain assembled (i.e., no sudden ruptures). Normal industry standard is 4 times (400%) of maximum operating pressure. See also "PROOF PRESSURE" and "MAXIMUM OPERATING PRESSURE."

C

CP (CHEMICALLY PURE) – Denotes a high purity gas, but the actual % purity will depend on the particular gas.

CALIBRATION – Comparison of a measurement standard or instrument with another standard or instrument to report or eliminate by adjustment any variation (deviation) in the accuracy of the item being compared.

CALIBRATION GAS – A gas or gas mixture of accurately known composition used as a comparative standard in analytical instrumentation.

CALORIE – The amount of heat required to raise the temperature of one gram of water one degree Celsius.

CARRIER GAS – Gas used with gas chromatography to carry the sample through the system.

CATALYST – A substance that initiates a chemical reaction and allows it to proceed under different conditions than otherwise possible.

CERTIFIED MIXTURE – A mixture whose concentration is determined by analysis and comparison with a Primary Standard of NIST reference material.

CGA NUMBER – Cylinder/container valve outlet connection number assigned by the Compressed Gas Association. CGA numbers are detailed in CGA Standard V-1.

CHECK VALVE – A mechanical device that allows flow of gas in only one predetermined direction, to prevent backflow of gas or contaminants.

CAS (CHEMICAL ABSTRACT SERVICES) – CAS numbers represent chemical substances recorded in the CAS Chemical Registry System. This numbering system identifies chemical substances by an unambiguous computer language description of its molecular structure, including all stereochemical detail. The CAS number, which has no chemical significance, is simply a number assigned in sequential order to each substance as it enters the Registry System. All specific substances reported in the world's scientific and technical literature, and indexed in Chemical Abstracts (CA) since 1965 (when the Registry System began), are included in this master file.

CHEMILUMINESCENCE – A species which chemically absorbs and emits light (usually at low temperatures).

CHROMATOGRAM – The record produced by the gas or liquid chromatograph. It is also a measure of instrument performance.

COEFFICIENT OF FLOW (Cv) – Defined as the actual flow performance in U.S. gallons of water per minute at 60°F when inlet pressure (P1) is 1 psig and outlet pressure (P2) is atmospheric (14.7 psia).

COLUMN – Part of the gas chromatography system where the separation of the sample takes place (can be packed or capillary).

COMBUSTION – An exothermic oxidation reaction which may occur with any organic compound, as well as with certain elements.

COMPRESSED GAS – (1) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F; or (2) a gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F, regardless of the pressure at 70°F; or (3) a liquid flammable material having a vapor pressure exceeding 40 psi at 100°F as determined by ASTM D-323-72.

CGA (COMPRESSED GAS ASSOCIATION) – This is a nonprofit technical association whose membership includes many corporations active in all phases of the compressed gas industry. Founded in 1913, the CGA uses the experience and knowledge of its members to promote industrywide standards and procedures for safety in the manufacture, storage, transport, and use of compressed gases.

CORROSIVE – The ability of a chemical compound to attack, and produce irreversible damage to, human tissues, such as eyes, skin or mucous membranes. Also, the ability of a chemical compound to attack and eat away rubber, metal and other substances.

CRACKING PRESSURE – A term used in back pressure control only (e.g., back pressure regulators, relief valves), for determining the inlet pressure at which flow starts.

CREEP – Any increase in outlet pressure of a pressure regulator subsequent to lockup, usually seen as a long term, slow pressure increase. This generally indicates a seat leak, which is an abnormal condition.

CRITICAL DENSITY – The density of a pure material at its critical temperature and critical pressure.

CRITICAL POINT – The transition point at which the liquid and gaseous states of a substance merge into each other. It is the temperature above which a substance cannot exist in two phases, no

matter how great the pressure. See also “CRITICAL TEMPERATURE” and “CRITICAL PRESSURE.”

CRITICAL PRESSURE – At the “CRITICAL TEMPERATURE,” the highest pressure at which a pure material can exist as a gas in equilibrium with its liquid.

CRITICAL TEMPERATURE – The temperature above which a gas cannot be liquefied by pressure alone. At this temperature, there is no distinction between liquid and vapor, both having the same density and constituting one homogenous system.

CRYOGENIC LIQUID – A liquid having a normal boiling point below -240°F (-151.11°C)

CRYOGENIC LIQUID CONTAINER – An insulated container designed to store, handle, and transport liquids having boiling points below -130°F.

CYLINDER – A container designed to hold compressed gases or liquefied compressed gases. Cylinders are manufactured and tested according to DOT/CTC/MEX specifications.

D

DEHYDRATION – Removal of one or more molecules of water from a chemical compound.

DELAYED (CHRONIC) HEALTH HAZARD – See “EPA HAZARD CATEGORIES.”

DELIVERY PRESSURE – See “OUTLET PRESSURE.”

DENSITY – The ratio of the amount of anything per unit volume; e.g., mass of any substance per unit volume at any definite temperature. It is usually expressed in pounds per cubic foot (lbs/ft³). See also “SPECIFIC GRAVITY.”

DEPARTMENT OF TRANSPORTATION (DOT) – This is a government agency whose Title 49, Code of Federal Regulations, regulates the transport of hazardous materials.

DEVICE GAS MIXTURE – A gas mixture that is used for the calibration of medical diagnostic equipment. The gas may enter the body, but its action is not dependent upon its being metabolized.

DEWAR – Vessel which contains cryogenic liquefied gases.

DEW POINT – The temperature at which the liquefaction of vapor begins; the term is usually applied to condensation of moisture from the water vapor in the atmosphere.

DISS (DIAMETER INDEX SAFETY SYSTEM) – DISS outlet valves are generally used with high-purity products, toxics, and corrosives. Valves equipped with DISS outlet assignment provide a metal-to-metal seal that creates low particle generation, a permeation-free environment, and good leak integrity.

DIAPHRAGM VALVE – Packless valve using a metal diaphragm to prevent leakage of gas through the valve stem. There is no direct connection between the hand wheel and the valve stem.

DIP TUBE – See “EDUCTOR TUBE.”

DOPANT – An impurity usually added in small amounts to a pure substance to alter its properties.

DOT ID NUMBERS – These are product identification numbers, assigned by the Department of Transportation (DOT) to assist members of fire and police departments in using the DOT Emergency Response Guidebook. DOT ID numbers contain two letters followed by four digits. The prefix UN (for United Nations) identifies products recognized throughout the world. Gaseous nitrogen, for example, is identified as UN 1066.

DROOP – The decrease in outlet set pressure of a pressure regulator which results from an increase in flow rate. Essentially the reverse of lockup. See also “LOCKUP.”

DRUG GAS – A gas or gas mixture that is inhaled and has a physiological effect upon the body.

E

ECD (ELECTRON CAPTURE DETECTOR) – A gas chromatography detector that is very sensitive to halogen-containing compounds. Uses P-5, nitrogen or helium.

EDUCTOR (LIQUID DELIVERY) TUBE – A tube inside a cylinder or container attached to the cylinder valve which allows liquid product withdrawal from the cylinder.

EFFLUENT SPLITTER – The part of the analytical instrument that splits the effluent stream into multiple detectors or some to vent for a lower volume of effluent.

EPA (ENVIRONMENTAL PROTECTION AGENCY) – This is a government agency that establishes environmental standards within the United States.

EPA HAZARD CATEGORIES – The hazard categories used throughout this manual as defined under EPA SARA Title III and 1910.1200 of Title 29 of the Code of Federal Regulations are as follows:

- Immediate (Acute) Health Hazard, including highly toxic, corrosive, toxic, irritant, sensitizer, and other hazardous chemicals which cause an adverse effect to a target organ, and manifest themselves within a short period of time following a one time, high exposure to the substance.

- Delayed (Chronic) Health Hazard, including carcinogens and other hazardous chemicals which cause an adverse effect to a target organ and manifest themselves after a long period of time following or during repeated contacts with the substance.
- Fire Hazard, including flammable, combustible pyrophoric, and oxidizer.
- Sudden Release of Pressure Hazard, including explosive and compressed gas.
- Reactive Hazard, including unstable reactive, organic peroxide, and water reactive.

EPA PROTOCOL GASES – Gas mixtures used for the calibration of stationary source continuous emission monitors (CEMs). The mixtures are manufactured according to procedures laid down by the EPA and are traceable to NIST SRMs.

EXPOSURE LIMITS – Concentrations of substances (and conditions) under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. “ACGIH” limits are called “TLV” and “OSHA” exposure limits are called “PEL.” See “THRESHOLD LIMIT VALUE.”

F

FID DETECTOR – FLAME IONIZATION DETECTOR – A gas chromatography detector that looks for substances that can be ionized in a flame. Commonly uses helium, hydrogen, and air.

FILLING DENSITY – The percent ratio of the weight of liquified compressed gas in a container to the weight of water that the container will hold at 60°F.

FIRE HAZARD – See “EPA HAZARD CATEGORIES.”

FLAME PHOTOMETRY – An instrument utilizing a flame for the analysis of metals, particularly in medical applications. Usually uses propane or methane.

FLAMMABLE GAS – (1) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13% by volume or less; or (2) a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.

FLAMMABLE LIMITS – The concentration of flammable vapor in air, oxygen, or other oxidants that will propagate flame upon contact when provided with a source of ignition. The lower explosive limit (LEL) is the concentration below which a flame will not propagate; the upper explosive limit (UEL) is the concentration above which a flame will not propagate. A change in temperature or pressure may alter the flammable limits.

FLAMMABLE RANGE – The range over which a gas at normal temperature and pressure will form a flammable mixture with air.

FLASH POINT – The lowest temperature at which a flammable liquid will give off enough vapor at or near its surface to form an ignitable mixture with air.

FLOW CAPACITY – The maximum flow capability of a control device established at a specific set of conditions.

FLOWMETER – An instrument used to measure flow rate. Measurement is either by a floating ball (Rotameter) or by heat transfer (Mass Flowmeter).

FLUID – Any material or substance that changes shape uniformly in response to an external force imposed upon it. The term applies to liquids, gases, and finely divided solids.

FREEZING POINT – The temperature at which a liquid solidifies. It is the temperature at which the liquid and solid states of a substance are in equilibrium at a given pressure.

G

GMIS (GAS MANUFACTURER'S INTERMEDIATE STANDARD) – An internal standard, directly traceable to a NIST SRM, used in the certification of mixtures.

GROSS WEIGHT – The weight of a package plus the weight of its contents.

H

HALOCARBONS – Any hydrocarbon combined with any of the five (F₂, Cl₂, Br, I, At) elements in the VIIA group of the periodic table.

HEAT OF ADSORPTION – The total heat involved in the adsorption process from zero adsorbate loading to some final adsorbate loading at a constant temperature (also called isothermal integral heat of adsorption).

HEAT OF FUSION – The heat energy required to transform one MOLE of substance from the liquid phase to the vapor phase at one atmosphere of pressure.

HYDROCARBON – An organic compound containing carbon and hydrogen.

I

I/M GASES – Calibration gas mixtures used for testing of mobile source emissions. Typically they contain CO, CO₂, Propane, and NO, are traceable to NIST SRMs.

IMMEDIATE (ACUTE) HEALTH HAZARD – See “EPA HAZARD CATEGORIES.”

INERT – A material which, under normal temperatures and pressures, does not react with other materials.

IR (INFRARED) – An area of the spectrum at longer wavelength than red light. Used in analysis as certain compounds absorb Infrared light at characteristic wavelengths.

INHIBITOR – A compound (usually organic) that retards or stops an undesired chemical reaction such as corrosion, oxidation or polymerization.

INLET PRESSURE (P1; SUPPLY PRESSURE; UPSTREAM PRESSURE) – The pressure of the fluid to the supply connection of a control device.

INORGANIC SUBSTANCE – Substances that do not contain carbon in their chemical structure.

IRRITANT – The ability of a chemical, which is not corrosive, to cause a reversible inflammatory effect on living tissue by chemical action at the site of contact.

ISOTHERMAL INTEGRAL HEAT OF ADSORPTION – See “HEAT OF ADSORPTION.”

ISOTOPES – Forms of an element that differ from one another in the mass of their atoms and in the properties dependent on that mass. Having the same atomic number and the same number of valence electrons, isotopes occupy the same position in the periodic table and have identical properties. They are distinguishable only by the small differences in atomic weight or by radioactive transformations.

K

KELVIN (K) – A unit of temperature related to the triple point of water.

L

LIQUEFIED COMPRESSED GAS – A gas which, under the charged pressure, is partially liquid at a temperature of 70°F (21.1°C).

LIQUID DENSITY – The ratio of the mass of a liquid per unit volume at any definite temperature. It is usually expressed in pounds per gallon or pounds per cubic foot.

LOCKUP – The increase in outlet pressure of a pressure regulator that occurs when flow is stopped. Essentially the reverse of DROOP.

LEL (LOWER EXPLOSIVE LIMIT) – The minimum percent by volume of a gas which, when mixed with air at normal temperature and pressure, will form a flammable mixture. See “FLAMMABLE GAS.”

M

MANIFOLD – A series of connectors to a common outlet allowing several cylinders to be used simultaneously.

MSDS (MATERIAL SAFETY DATA SHEET) – An MSDS is a substance fact sheet containing characteristics and hazards of specific hazardous industrial material. Also, these data sheets provide precautionary information on safe handling of the material, as well as emergency and first aid procedures.

MAXIMUM OPERATING PRESSURE – The maximum allowable use pressure for which a system is designed. Also referred to as “WORKING PRESSURE.”

MELTING POINT – The temperature at which the solid and liquid phase of a substance are in equilibrium (normally specified at one atm).

METERING VALVE – A valve capable of accurately controlling the flow of a gas. Usually a needle valve.

MICRON – One millionth of a meter.

MIXTURE – Any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

MOLE – The weight of a substance equal numerically to its molecular weight. A gram-mole is the weight in grams equal to the molecular weight; a pound-mole is the weight in pounds equal to the molecular weight.

MOLECULAR WEIGHT – The sum of the atomic weights of all the constituent atoms in the molecule of an element or a compound.

N

NANOGRAM (ng) – One billionth of a gram (10^{-9}).

NANOMETER (m) – One billionth of a meter (10^{-9}).

NF (NATIONAL FORMULARY) – A supplement to the United States Pharmacopoeia.

NEEDLE VALVE – Valve using a needle-shaped stem moving into and closing a small orifice. Accurately meters flow.

NIST (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY) – Government organization that supplies Standard Reference Materials – “THE NATIONAL STANDARD.”

NTRM (NIST TRACEABLE REFERENCE MATERIAL) – A standard produced by a gas manufacturer and certified by NIST. Considered by NIST and EPA to be equivalent to an SRM.

NO_x – General symbol for Oxides of Nitrogen. Can include Nitric Oxide, Nitrogen Dioxide and Nitrogen Trioxide.

NON-LIQUEFIED GAS – A substance that exists entirely as a gas at 70°F.

NORMAL BOILING POINT (nbp) – The temperature at which the vapor pressure of a liquid reaches 760 mm of mercury.

NORMAL EVAPORATION RATE (NER) – The degree of product loss from a cryogenic liquid container due to heat leak into the container as designed. The NER is checked by measuring the amount of product loss over a specified time and serves to confirm whether the insulation is still effective.

NORMAL TEMPERATURE AND PRESSURE (NTP) – A gas industry reference base. Normal temperature is 70°F. Normal pressure is one atmosphere, or 14.696 psia.

O

OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION) – An organization within the U.S. Department of Labor which sets standards for employers to ensure safe and healthful working conditions for employees.

OUTLET PRESSURE (P₂; DELIVERY PRESSURE; DOWNSTREAM PRESSURE) – The pressure of the fluid from the discharge connection of a control device.

OXIDIZING AGENT – A chemical reagent which causes oxidation of other substances and is thereby reduced.

P

PACKED VALVE – A valve that relies on a compressed packing to prevent leakage of gas between the valve stem and body.

PACKLESS VALVE – A valve that uses a metal seal, such as a diaphragm, to seal the body from the valve stem and prevent any gas leakage.

PARTIAL PRESSURE – In any gas mixture the total pressure is equal to the sum of the pressures (partial) which each gas would exert were it alone in the volume occupied by the “MIXTURE.”

PEL (PERMISSIBLE EXPOSURE LIMITS) – See “EXPOSURE LIMIT.”

PHYSICAL HAZARD – Descriptive of a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable reactive or water reactive.

POISON – A substance that in relatively small doses has an action, when it is ingested by, injected into, inhaled or absorbed by, or applied to a living organism, that either destroys life or impairs seriously the function of one or more organs or tissues.

POLYMERIZATION – A chemical reaction, usually carried out with a catalyst, heat or light, and often under high pressure, in which a large number of relatively simple molecules combine to form a chain-like macromolecule.

ppb (PARTS PER BILLION) – Equal to 0.0000001%.

ppm (PARTS PER MILLION) – A convenient means for expressing low concentrations. As applied to gases, ppm stands for moles per million moles. ppm by weight is expressed as pounds per million pounds. ppm by volume is usually expressed in cubic feet per million cubic feet. Equal to 0.00001%.

PRIMARY STANDARD – A standard whose concentration can be traced directly to a fundamental unit of measurement such as mass. Standard of highest accuracy and precision.

PROOF PRESSURE – A test pressure applied to control devices to verify structural integrity. No deformation or excessive leakage is permitted at this pressure and the control device must function normally subsequent to this test. Normal industry standard is 1.5 times (150%) of “WORKING PRESSURE.” See also “BURST PRESSURE” and “MAXIMUM OPERATING PRESSURE.”

PURGE – Flushing of cylinders, manifolds or other equipment with an inert gas to remove contamination or residue. Purging improves efficiency of the process.

PYROPHORIC – The ability of a chemical to ignite spontaneously in air at a temperature of 130°F or below.

PYROPHORIC GAS – A gas that can spontaneously self-ignite when exposed to normal atmospheric conditions.

R

RARE GAS – Refers to those constituents of air which comprise less than 1% of air and are generally considered inert, such as argon, helium, krypton, neon and xenon.

REACTIVE HAZARD – See “EPA HAZARD.”

REFERENCE GAS – A gas or gas mixture with precisely defined composition used as a reference standard in instrumental analysis.

RELIEF VALVE – A type of pressure relief device which is designed to relieve excessive pressure, and to reclose and reseal, to prevent further flow of gas from the cylinder after reseating pressure has been achieved.

RFO (RESTRICTIVE FLOW ORIFICE) – A safety device placed in the outlet of a cylinder valve intended to limit the release rate of a hazardous gas to a maximum specified range in the event of the inadvertent opening of the valve or the failure of the system downstream of the valve outlet.

ROTAMETER – See “FLOWMETER.”

S

SAFETY RELIEF DEVICE – A safety device usually incorporated in a cylinder valve and actuated by excessive pressure or temperature, or both, at predetermined limits to avoid failure of the pressure vessel.

SELF-RELIEVING (SELF-VENTING) – A feature incorporated in certain pressure reducing regulators which enables the unit to relieve the outlet pressure when adjusted in the decrease direction.

SENSITIZER – The ability of a chemical to cause a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

STEL (SHORT TERM EXPOSURE LIMIT) – See “THRESHOLD LIMIT VALUE – SHORT TERM EXPOSURE LIMIT.”

SUPPLY PRESSURE – See “INLET PRESSURE.”

SKIN – The skin designation, used with the terms TLV-TWA and OSHA-PEL, indicates that cutaneous absorption may contribute to the overall exposure.

SOLVENT – A substance capable of dissolving another substance (solute) to form a uniformly dispersed mixture (solution) at the molecular or ionic size level.

SPAN GAS – Gases which are used as a reference point to span an analyzer.

SPECIFIC GRAVITY (Sp. Gr.) – The ratio of the weight of one substance compared to the weight of an equal volume of another substance which is used as a standard. Usually gases are compared to air (air = 1) while liquids and solids are compared to water ($H_2O = 1$).

SPECIFIC HEAT – Amount of heat required to raise a unit mass of a substance one degree of temperature at either constant pressure (Cp) or constant volume (Cv).

SPECIFIC HEAT RATIO – The ratio of “SPECIFIC HEAT” at constant pressure ($0^\circ C$) to the specific heat at constant volume (Cv).

SPECIFIC VOLUME (Sp. Vol.) – Volume occupied by a unit mass of a substance at a given temperature. It is usually expressed in cubic feet per pound or gallons per pound.

SPRING HOUSING – See “BONNET.”

SRM (STANDARD REFERENCE MATERIAL) – A national standard produced by NIST. The highest level of standard available.

STAINLESS STEEL – Alloy steels containing high percentages of chromium, from less than 10% to more than 25%.

STP (STANDARD TEMPERATURE AND PRESSURE) – An internationally accepted reference base. Standard temperature is $0^\circ C$. Standard pressure is one atmosphere or 14.6960 psia.

SUBLIMATION – The direct passage of a substance from solid to vapor without appearing in the intermediate (liquid) state. An example is solid carbon dioxide (dry ice) which vaporizes at room temperature.

SUDDEN RELEASE OF PRESSURE HAZARD – See “EPA HAZARD CATEGORIES.”

SUCK BACK – The reverse flow of gas or liquid. Usually refers to the back flow of liquid into a gas cylinder.

T

TARE WEIGHT – The weight of an empty cylinder without cap and valve.

TLV (THRESHOLD LIMIT VALUE) – TLVs are measures of toxicity established by the ACGIH. The TLV of a substance refers, in general, to airborne concentrations at or below which nearly all workers may be repeatedly exposed without adverse effect.

THRESHOLD LIMIT VALUE – CEILING (TLV-CEILING) – Refers to an airborne concentration that should not be exceeded, even instantaneously.

TLV-STEL (THRESHOLD LIMIT VALUE – SHORT TERM EXPOSURE LIMIT) – Refers to a 15-minute time-weighted average exposure which should not be exceeded at any time during a workday, even if the time-weighted average is within the TLV. It supplements the 8-hour TLV-TWA for certain substances that produce acute effects on high, short-term exposure.

TLV-TWA (THRESHOLD LIMIT VALUE – TIME WEIGHTED AVERAGE) – Refers to the time-weighted average concentration for a normal 8 hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

TIED-DIAPHRAGM – See “ATTACHED POPPET.”

TIED-SEAT – See “ATTACHED POPPET.”

THC (TOTAL HYDROCARBON CONTENT) – THC is used to describe the quantity of the hydrocarbon impurities present. Usually expressed as methane equivalents.

TOXIC – A substance that has the ability to produce injurious or lethal effects through its chemical interaction with the body.

TRIPLE POINT (tp) – The definite temperature and pressure for a pure substance at which the three phases (solid, liquid, and vapor) coexist in equilibrium as an invariant system.

U

UN (UNITED NATIONS) – See “DOT ID NUMBERS.”

USP (UNITED STATES PHARMACOPOEIA) – The official publication for drug product standards.

UNSTABLE REACTIVE – The ability of a chemical in the pure state, or as produced or transported, to vigorously polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure or temperature.

UPSTREAM PRESSURE – See “INLET PRESSURE.”

V

VAPOR PRESSURE – The pressure characteristic at any given temperature of a vapor in equilibrium with its liquid or solid form.

W

WATER REACTIVE – The ability of a chemical to react with water to release a gas that is either flammable or presents a health hazard.

WORKING PRESSURE – See “MAXIMUM OPERATING PRESSURE.”

Z

ZERO GAS – Gases which are used as a reference point to “zero” an analyzer.

Physical Properties

Product	Formula	Molecular Weight (lb/lb mol)	Critical Properties			Boiling Point at 1 atm (°F)	Heat of Vaporization at BP (Btu/lb)	Melting Point (°F)	Saturated Properties at 70°F			Gas Properties at 70°F and 1 atm			
			Critical Temp. (°F)	Critical Pressure (psia)	Critical Density (lb/ft³)				Vapor Pressure (psia)	Heat of Vaporization (Btu/lb)	Liquid Density (lb/ft³)	Gas Density (lb/ft³)	Specific Volume (ft³/lb)	Specific Gravity (Air=1.0)	Specific Heat, Cp (Btu/lb mol • °F)
Acetylene	C ₂ H ₂	26.04	96.0	906.0	14.39	-119.6	352.5	-113.4	586.3	126.2	23.61	0.068	14.77	0.899	10.53
Air	—	28.96	—	—	—	-317.8	87.8	—	—	—	—	0.081	12.35	1.000	6.96
Ammonia	NH ₃	17.03	270.1	1636.0	14.67	-28.3	590.3	-107.9	129.0	510.0	38.55	0.044	22.49	0.588	8.69
Argon	Ar	39.95	-188.4	705.8	33.17	-302.5	69.4	-308.8	—	—	—	0.103	9.68	1.379	4.98
Arsine	AsH ₃	77.95	221.8	957.3	37.44	-79.9	92.1	-178.5	217.9	70.2	92.59	0.204	4.91	2.691	9.23
Boron Trichloride	BCl ₃	117.17	353.8	561.3	16.80	55.1	87.8	-160.6	19.7	85.9	81.40	0.314	3.18	4.045	15.55
Boron Trifluoride	BF ₃	67.80	10.0	723.0	36.90	-147.5	109.3	-199.7	—	—	—	0.176	5.68	2.341	12.08
Bromine Trifluoride	BrF ₃	136.90	9.9	723.0	—	258.2	134.1	48.0	0.1	134.1	175.61	0.0024*	415.08	4.727	15.81
1,3-Butadiene	C ₄ H ₆	54.09	305.6	626.9	15.3	23.7	179.9	-164.1	36.5	169.8	38.67	0.143	6.98	1.868	20.45
Butane	C ₄ H ₁₀	58.12	305.9	549.9	14.20	31.0	165.9	-217.0	31.3	157.1	36.05	0.155	6.45	2.007	23.87
iso-Butane	C ₄ H ₁₀	58.12	275.0	539.5	13.8	11.2	157.6	-255.3	45.2	143.7	34.49	0.155	6.47	2.007	23.52
1-Butene	C ₄ H ₈	56.11	295.5	569.3	14.6	21.1	172.1	-301.6	38.5	159.9	36.97	0.149	6.70	1.937	20.87
cis-2-Butene	C ₄ H ₈	56.11	320.0	610.2	15.0	53.1	175.0	-217.6	20.3	170.9	29.02	0.151	6.61	1.937	19.50
trans-2-Butene	C ₄ H ₈	56.11	311.0	591.8	14.7	47.3	172.6	-157.5	22.6	167.3	28.46	0.151	6.62	1.937	21.80
Carbon Dioxide	CO ₂	44.01	87.9	1071.0	29.20	-109.2	246.3	-69.9	852.8	63.2	47.64	0.114	8.74	1.519	8.93
Carbon Monoxide	CO	28.01	-220.4	507.0	18.79	-312.7	92.1	-337.1	—	—	—	0.072	13.80	0.967	6.97
Chlorine	Cl ₂	70.91	291.2	1118.4	35.79	-28.8	123.7	-149.8	99.6	109.0	85.54	0.186	5.39	2.448	8.24
Chlorine Trifluoride	ClF ₃	92.45	345.2	837.6	37.5	53.1	115.7	-105.3	21.5	125.5	113.60	0.244	4.09	3.192	15.66
Deuterium	D ₂	4.03	-390.8	241.5	4.2	-417.0	130.9	-426.0	—	—	—	0.010	96.00	0.139	6.95
Diborane	B ₂ H ₆	27.67	62.1	580.8	10.4	-134.8	230.3	-264.8	—	—	—	0.072	13.86	0.955	13.79
Dichlorosilane	SiH ₂ Cl ₂	101.01	348.8	678.2	28.9	46.7	—	-187.6	23.3	—	75.19	0.269	3.72	3.487	14.74
Dimethylamine	(CH ₃) ₂ NH	45.09	328.3	769.4	—	44.0	—	-133.9	26.1	—	40.90	0.119	8.37	1.557	16.57
Disilane	Si ₂ H ₆	62.22	303.5	746.9	21.1	6.7	147.8	-206.7	47.6	—	49.90	0.166	6.01	2.148	19.54
Ethane	C ₂ H ₆	30.07	90.4	707.9	12.70	-127.5	210.1	-297.9	559.6	85.0	20.98	0.078	12.76	1.038	12.67
Ethyl Chloride	C ₂ H ₅ Cl	64.52	369.0	754.2	20.1	54.0	165.0	-213.5	20.3	161.8	55.78	0.172	5.82	2.227	15.41
Ethylene	C ₂ H ₄	28.05	49.1	736.0	14.17	-154.8	207.5	-272.5	—	—	—	0.073	13.71	0.969	10.28
Fluorine	F ₂	38.00	-199.9	754.6	35.81	-306.8	74.8	-363.4	—	—	—	0.098	10.18	1.312	7.49
Halocarbon-23	CHF ₃	70.01	78.7	701.4	32.2	-115.9	104.0	-247.3	626.0	31.5	49.02	0.182	5.48	2.417	12.29
Halocarbon-116	C ₂ F ₆	138.01	67.5	432.2	38.0	-108.7	50.4	-149.3	429.9*	—	44.13*	0.361	2.77	4.765	25.27
Helium	He	4.00	-450.3	33.0	4.33	-452.0	8.8	—	—	—	—	0.010	96.67	0.138	4.97
Hydrogen	H ₂	2.02	-400.0	190.8	1.88	-423.2	195.3	-434.5	—	—	—	0.005	191.95	0.070	6.87
Hydrogen Bromide	HBr	80.92	194.0	1240.4	45.8	-88.0	93.2	-124.4	311.4	70.3	113.09	0.211	4.74	2.794	7.07
Hydrogen Chloride	HCl	36.46	124.5	1199.2	26.22	-120.8	190.6	-173.6	629.1	108.5	51.28	0.095	10.55	1.259	7.29
Hydrogen Fluoride	HF	20.01	370.4	972.5	18.2	-108.7	159.6	-118.4	14.13*	158.3	61.39*	0.177*	5.65*	4.765	—
Hydrogen Sulfide	H ₂ S	34.08	212.8	1306.5	21.77	-74.9	235.9	-122.0	263.6	180.8	48.52	0.089	11.26	1.176	8.29
Krypton	Kr	83.80	-82.8	798.0	57.4	-244.1	46.35	-251.3	—	—	—	0.217	4.61	2.893	4.99
Methane	CH ₄	16.04	-116.2	673.0	10.10	-258.7	219.5	-296.5	—	—	—	0.042	24.06	0.554	8.53
Methyl Chloride	CH ₃ Cl	50.49	290.8	964.0	22.04	-11.2	184.1	-143.9	73.4	163.7	57.52	0.207	4.83	1.740	10.44
Methyl Fluoride	CH ₃ F	34.03	112.3	852.2	—	-109.0	—	-223.2	506.3	—	36.19	0.089	11.23	1.170	9.00
Monomethylamine	CH ₃ NH ₂	31.06	314.4	1082.0	—	20.4	184.1	-136.2	44.4	—	41.15	0.082	12.25	1.072	12.02
Neon	Ne	20.18	-379.8	384.9	30.15	-410.9	36.9	-415.5	—	—	—	0.052	19.18	0.697	4.97
Nitrogen	N ₂	28.01	-232.5	492.3	19.40	-320.4	85.6	-345.9	—	—	—	0.072	13.80	0.967	6.97
Nitrogen Trifluoride	NF ₃	71.00	-38.5	646.9	34.1	-200.2	70.1	-340.2	—	—	—	0.184	5.43	2.451	12.66
Nitrous Oxide	N ₂ O	44.01	97.6	1053.3	28.61	-128.3	160.2	-131.6	751.3	71.7	48.21	0.114	8.74	1.520	9.17
Octafluorocyclobutane	C ₄ F ₈	200.03	239.4	402.8	—	21.2	—	-40.9	39.9	—	94.65	0.535	1.87	6.906	37.29
Octafluoropropane	C ₃ F ₈	188.02	161.4	386.1	39.20	-34.3	45.2	-233.8	114.1	34.0	84.66	0.498	2.01	6.491	35.40
Oxygen	O ₂	32.00	-181.8	729.1	26.80	-297.4	91.5	-361.9	—	—	—	0.083	12.08	1.105	7.03
Phosphine	PH ₃	34.00	124.9	947.9	18.8	-126.0	177.3	-208.8	493.2	—	35.50	0.088	11.30	1.174	8.93
Propane	C ₃ H ₈	44.10	206.6	617.6	13.70	-43.7	183.0	-305.8	124.9	147.1	31.12	0.116	8.62	1.522	17.71
Propylene	C ₃ H ₆	42.08	197.5	666.3	14.51	-53.8	188.3	-301.4	152.2	146.0	31.92	0.110	9.06	1.453	15.56
Silane	SiH ₄	32.12	25.8	702.5	15.1	-170.4	164.6	-301.0	—	—	—	0.083	11.98	1.109	10.24
Silicon Tetrachloride	SiCl ₄	169.90	453.0	521.1	32.5	136.6	70.5	-94.0	4.0	75.6	92.13	0.121*	8.25	5.866	21.63
Silicon Tetrafluoride	SiF ₄	104.08	6.5	539.3	42.66	-148.3	64.6	-124.2	—	—	—	0.271	3.69	3.593	17.50
Sulfur Dioxide	SO ₂	64.06	315.5	1142.0	32.78	13.8	167.5	-103.9	50.1	155.0	83.66	0.168	5.95	2.212	9.70
Sulfur Hexafluoride	SF ₆	146.05	114.0	545.2	46.04	-83.02	48.5	-58.9	310.2	28.2	86.25	0.382	2.62	5.042	22.91
Sulfur Tetrafluoride	SF ₄	108.05	114.0	545.2	—	-53.5	105.3	-184.9	152.7	—	82.68	0.284	3.53	3.731	18.65
Tetrafluoromethane	CF ₄	88.00	-50.2	543.6	39.06	-198.5	58.5	-298.5	—	—	—	0.228	4.38	3.038	14.43
Trimethylamine	(CH ₃) ₃ N	59.11	320.3	591.8	39.06	37.2	—	-178.8	28.0	—	39.61	0.157	6.35	2.041	22.03
Tungsten Hexafluoride	WF ₆	297.84	337.7	619.3	81.6	63.0	38.1	-35.6	17.1	37.7	212.58	0.795	1.26	10.283	28.79
Xenon	Xe	131.30	61.9	847.1	68.65	-162.6	41.4	-169.4	—	—	—	0.341	2.93	4.533	5.02

*Value given is for saturated conditions; 70°F and 14.7 psia.

Material Compatibility Chart

Gas	Primary Hazards					Metals					Plastics				Elastomers			Special Characteristics
	Asphyxiant	Toxic	Flammable	Corrosive	Oxidizer	Aluminum	Brass	Copper	Monel	Stainless Steel	PCTFE	PTFE	Tefzel®	Kynar®	Viton®	Buna-N®	Neoprene®	
Acetylene						S	S	U	S	S	S	S	S	S	S	S	S	Extremely hazardous at pressures exceeding 15 psig. Brass with less than 65% copper content, suitable. Causes stress cracking of copper or copper alloys.
Air						S	S	S	S	S	S	S	S	S	S	S	S	
Ammonia						S	U	U	S	S	S	S	S	U	U	S	S	
Argon						S	S	S	S	S	S	S	S	S	S	S	S	Highly toxic
*Arsine						-	S	S	S	S	S	S	S	S	S	S	S	
Boron Trichloride						U	D	D	S	S	S	S	S	-	-	-	-	
Boron Trifluoride						-	D	D	S	S	S	S	S	-	-	-	-	Extremely reactive. Surface passivation required on all metals.
Boron-11 Trifluoride						-	D	D	S	S	S	S	S	-	-	-	-	
*Bromine Trifluoride						D	D	D	S	S	D	D	S	U	U	U	U	
1,3-Butadiene						S	S	S	S	S	S	S	S	S	S	S	S	Highly toxic
n-Butane						S	S	S	S	S	S	S	S	S	S	S	S	
1-Butene						S	S	S	S	S	S	S	S	S	S	S	S	
cis-2-Butene						S	S	S	S	S	S	S	S	S	S	S	S	Extremely reactive. Surface passivation required on all metals.
trans-2-Butene						S	S	S	S	S	S	S	S	S	S	S	S	
Carbon Dioxide						S	S	S	S	S	S	S	S	S	S	D	D	
Carbon Monoxide						S	S	S	S	S	S	S	S	S	S	S	S	Highly toxic
Chlorine						U	U	U	S	S	S	S	S	S	S	U	U	
*Chlorine Trifluoride						U	-	-	S	S	D	D	S	U	U	U	U	
Deuterium						S	S	S	S	S	S	S	S	S	S	S	S	Extremely reactive. Surface passivation required on all metals.
Dichlorosilane						U	-	-	S	S	S	S	S	S	-	-	-	
Di-, Mono-, and Trimethylamines						U	U	U	S	S	S	S	S	S	U	U	-	
Disilane						S	S	S	S	S	S	S	S	S	S	S	S	Extremely reactive. Surface passivation required on all metals.
Ethane						S	S	S	S	S	S	S	S	S	S	S	S	
Ethyl Chloride						S	S	S	S	S	S	S	S	S	S	S	S	
Ethylene						S	S	S	S	S	S	S	S	S	S	S	S	Extremely reactive. Surface passivation required on all metals.
*Fluorine						D	D	D	S	S	D	D	D	D	U	U	U	
Halocarbon-14						S	S	S	S	S	S	S	S	S	S	S	S	
Halocarbon-23						S	S	S	S	S	S	S	S	S	S	S	S	Flammable; may react with aluminum to form pyrophoric compound.
Halocarbon-116						S	S	S	S	S	S	S	S	S	S	S	S	
Helium						S	S	S	S	S	S	S	S	S	S	S	S	
Hydrogen						S	S	S	S	S	S	S	S	S	S	S	S	Liquid may leach plasticizer out of certain plastics.
Hydrogen Bromide						U	U	U	S	S	S	S	S	S	S	U	U	
Hydrogen Chloride						U	U	U	S	S	S	S	S	S	S	U	U	
*Hydrogen Fluoride						U	U	U	S	S	S	S	S	S	U	U	U	Highly toxic. High concentrations are pyrophoric.
*Hydrogen Sulfide						S	S	-	S	S	S	S	S	S	U	S	S	
Isobutane						S	S	S	S	S	S	S	S	S	S	S	S	
Isobutylene						S	S	S	S	S	S	S	S	S	S	S	S	Pyrophoric.
Krypton						S	S	S	S	S	S	S	S	S	S	S	S	
Methane						S	S	S	S	S	S	S	S	S	S	S	S	
Methyl Chloride						U	S	S	S	S	S	S	S	S	S	U	U	Flammable; may react with aluminum to form pyrophoric compound.
Methyl Fluoride						S	S	S	S	S	S	S	S	S	-	-	-	
Neon						S	S	S	S	S	S	S	S	S	S	S	S	
Nitrogen						S	S	S	S	S	S	S	S	S	S	S	S	Liquid may leach plasticizer out of certain plastics.
Nitrogen Dioxide						S	U	U	U	S	S	S	-	-	U	U	U	
Nitrogen Trifluoride						-	S	S	S	S	S	S	S	S	S	-	-	
Nitrous Oxide						S	S	S	S	S	S	S	S	S	S	S	S	Highly toxic. High concentrations are pyrophoric.
Octafluorocyclobutane						S	S	S	S	S	S	S	S	S	S	S	S	
Octafluoropropane						S	S	S	S	S	S	S	S	-	-	S	S	
*Oxygen						U	S	S	S	D	S	S	S	S	D	U	U	Highly toxic. High concentrations are pyrophoric.
*Phosphine						S	-	-	S	S	S	S	S	-	-	-	-	
Propane						S	S	S	S	S	S	S	S	S	S	S	S	
Propylene						S	S	S	S	S	S	S	S	S	S	S	U	Pyrophoric.
*Silane						S	S	S	S	S	S	S	S	S	S	S	S	
Silicon Tetrachloride						U	U	U	S	S	S	S	S	S	U	U	U	
Silicon Tetrafluoride						U	U	U	S	S	S	S	S	S	U	U	U	Pyrophoric.
Sulfur Dioxide						S	U	S	S	S	S	S	S	S	S	U	U	
Sulfur Hexafluoride						S	S	S	S	S	S	S	S	S	S	S	S	
Sulfur Tetrafluoride						U	U	U	S	S	S	S	S	S	U	U	U	Pyrophoric.
Tungsten Hexafluoride						U	U	U	S	S	S	S	S	S	U	U	U	
Xenon						S	S	S	S	S	S	S	S	S	S	S	S	

The data in this table are presented as a guide only. Please call our Technical Information Center for assistance with your specific application.

Key: S = Satisfactory for use with the intended gas (dry anhydrous) at a normal operating temperature of 70°F.

U = Unsatisfactory for use with the intended gas.

(-) = Insufficient data available to determine the compatibility with the intended gas.

D = Suitability depends on condition of use.

*THE USER SHOULD BECOME THOROUGHLY FAMILIAR WITH THE SPECIFIC PROPERTIES OF THIS GAS. MATERIAL COMPATIBILITY DEPENDS ON CONDITION OF USE.