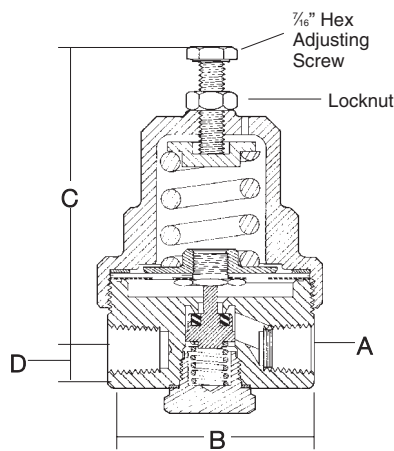


Cryogenic Regulators

RG Series



Application

The RG series cryogenic regulators are primarily designed to maintain pressure on cryogenic liquid within cryogenic containers. They may also be used in cryogenic lines, vaporizer and converter applications. They are especially useful in installations where space and cost limitations are important.

Features

- All parts are copper alloy (brass), PTFE and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to -320°F.
- Body and bonnet machined from solid brass bar stock.
- PTFE seat helps assure a positive shut-off at cryogenic temperatures down to -320°F.
- High and low pressure regulators are the same compact size—designed to fit in close quarters. The compact high pressure design has no loss of flow capacity.
- Interchangeable with existing cryogenic regulator units.
- Inlet filter helps prevent foreign material from entering the regulator.
- Locknut is provided to maintain adjusting screw setting.
- Maximum inlet pressure of 550 PSIG.
- Cleaned for liquid oxygen service per CGA G-4.1

Materials

Body.....	Brass
Bonnet.....	Brass
Seat Retainer.....	Brass
Seat.....	PTFE
Springs.....	Stainless Steel
Diaphragm Gasket.....	PTFE
Backcap Gasket.....	Copper

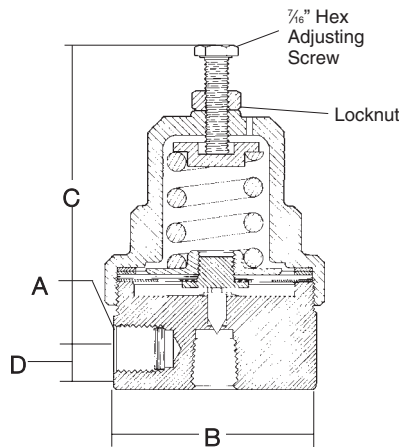
Ordering Information

Part Number	Inlet / Outlet Connections (F.NPT) A	Width B	C	D	Pressure Setting (PSIG)	Operating Range (PSIG)
RG125	1/4"	2 1/4"	3"	5/8"	125	25-250
RG300					300	125-350

*Contact factory for additional settings.

Cryogenic Economizers

ECL Series



Application

The ECL series cryogenic economizers are primarily designed to utilize the gas pressure in a liquid cryogenic cylinder that would otherwise be lost to the atmosphere through the pressure relief valve. They may also be used in cryogenic lines, vaporizer and converter applications. They are especially useful in installations where space and cost limitations are important.

Features

- All parts are copper alloy (brass), PTFE and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to -320°F.
- Body and bonnet machined from solid brass bar stock.
- The ECL Series utilizes a stainless steel needle seat design that provides a very sensitive flow control at lower pressure settings.
- High and low pressure economizers are the same compact size—designed to fit in close quarters. The compact high pressure design has no loss of capacity.
- Interchangeable with existing cryogenic economizer units.
- Inlet filter helps prevent foreign materials from entering the economizer.
- Locknut is provided to maintain adjusting screw settings.
- Maximum inlet pressure of 550 PSIG.
- Cleaned for liquid oxygen service per CGA G-4.1

Materials

Body.....	Brass
Bonnet.....	Brass
Seat.....	Stainless Steel
Springs.....	Stainless Steel
Gasket.....	PTFE

Ordering Information

Part Number	Inlet/Outlet Connections (F.NPT) A	Width B	C	D	Factory Pressure Setting (PSIG)	Operating Range (PSIG)
ECL22	1/4"	2 1/4"	3"	3/8"	22	10-150
ECL70					70	
ECL140					140	
ECL325					325	

*Contact factory for additional settings.

RegO Combination Pressure Build/Economizer Regulator

Application

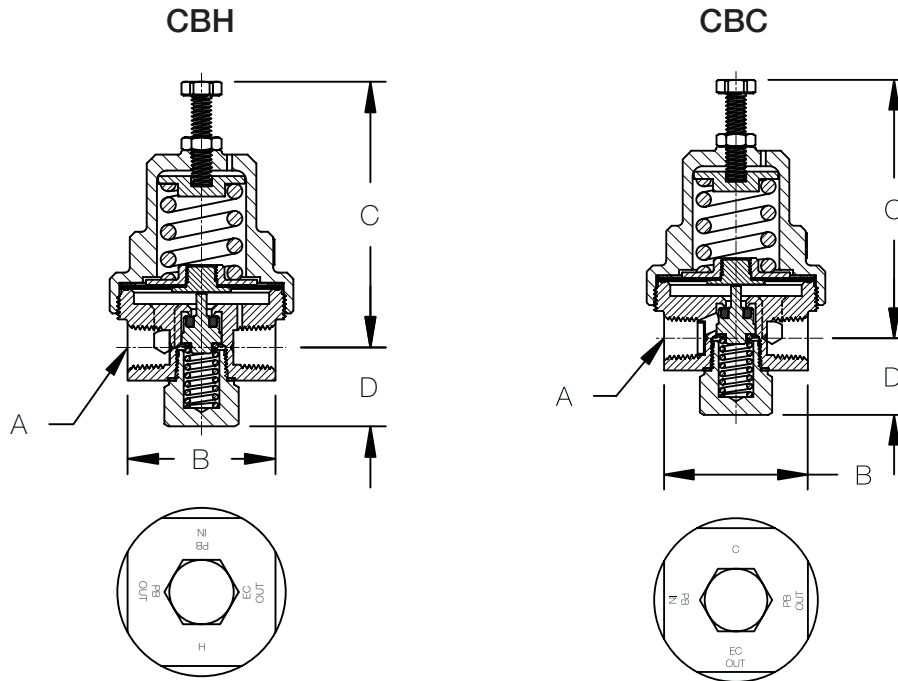
Combines the function of RG and ECL Pressure Building and Economizer functions in one compact unit. Available in Chart and Harsco piping geometries and a variety of pressure ratings.

Features

- Precision silver brazed assembly
- Repeatable performance and geometry
- 100% factory tested
- Temperature range -320° to +165° F

Materials

Body	Brass
Bonnet	Brass
Seat Disk	Steel
Spring	Steel
Gasket	PTFE



Part Number	Inlet/Outlet Connections (F.NPT)	"A"	"B"	"C"	"D"	Factory Pressure Setting (PSIG)	Operating Range (PSIG)
CBH000125	¼"	¼"	1.182"	3.245"	.966"	125	25-250
CBH000300	¼"	¼"	1.182"	3.245"	.966"	300	150-350
CBH000325	¼"	¼"	1.182"	3.245"	.966"	325	150-350
CBC000125	¼"	¼"	1.182"	3.245"	.966"	125	25-250
CBC000300	¼"	¼"	1.182"	3.245"	.966"	300	150-350
CBC000325	¼"	¼"	1.182"	3.245"	.966"	325	150-350

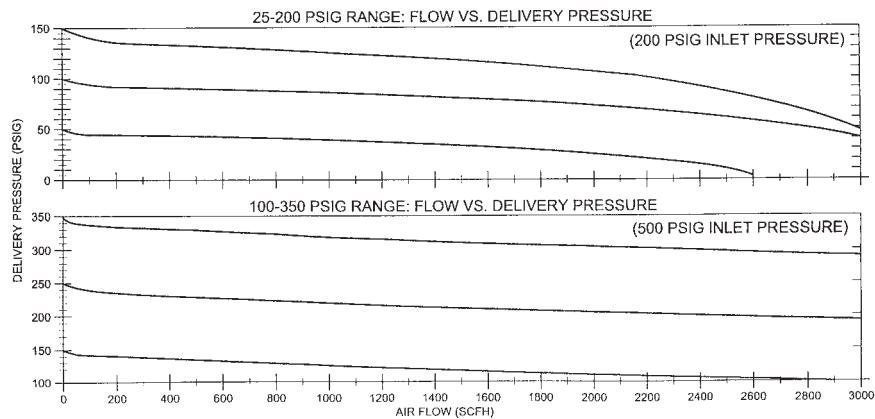
Cryogenic Liquid Cylinder Regulator

Application

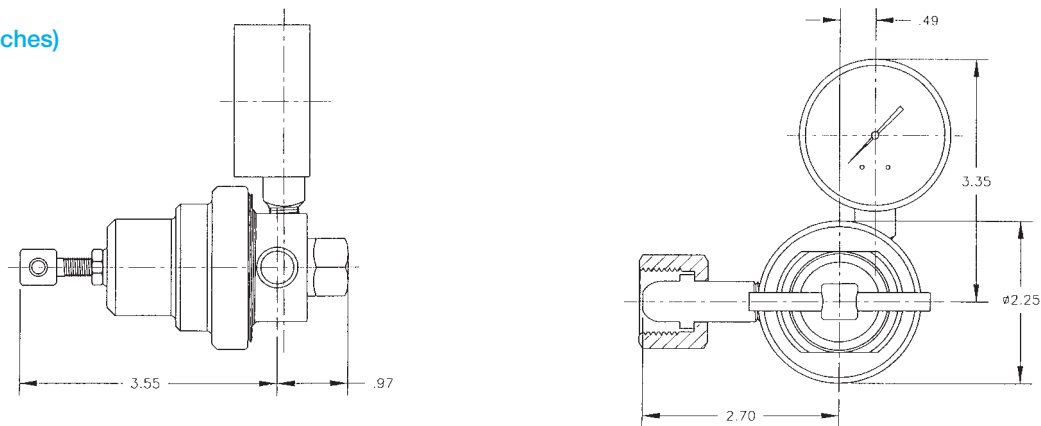
The new REGO LCR Series regulator assembly controls the pressure from the gas use line discharge of any liquid cylinder with a flow capacity at least double the vaporization capacity of the cylinder vaporization coil. For use with oxygen, nitrogen, argon, or carbon dioxide liquid cylinders.

Features

- Maximum Inlet Pressure: 550 psig
- Temperature Range: -320° F to 165°F
- Brass Body and Diaphragm
- PTFE Seat
- Stainless Steel Springs, Adjusting Screw and Nut
- 1/4" Female NPT Outlet
- CGA fitting inlet connection for ready hook-up.
- Pressure Gauge for delivery pressure reading.
- Two delivery pressure ranges available
- Cleaned for use in oxygen per CGA G-4.1.
- $C_v = 2.1$



Dimensions (inches)



Ordering Information

Part Number	Gas	Liquid Cylinder Connection	Delivery Pressure Range
LCR-B580	Nitrogen/Argon	CGA 580	25 to 250 psig
LCR-B540	Oxygen	CGA 540	25 to 250 psig
LCR-B320	Carbon Dioxide	CGA 320	25 to 250 psig
LCR-C580	Nitrogen/Argon	CGA 580	100 to 350 psig
LCR-C540	Oxygen	CGA 540	100 to 350 psig
LCR-C320	Carbon Dioxide	CGA 320	100 to 350 psig

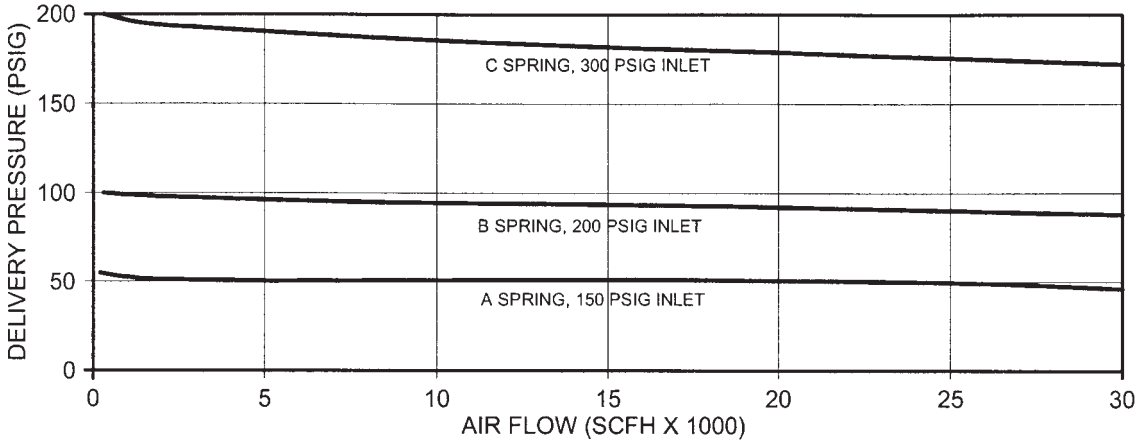
Heavy Duty Brass Final Line Pressure Regulator

BR-1780 Series

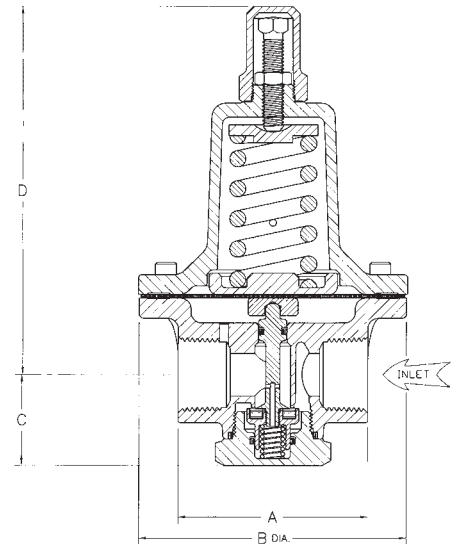
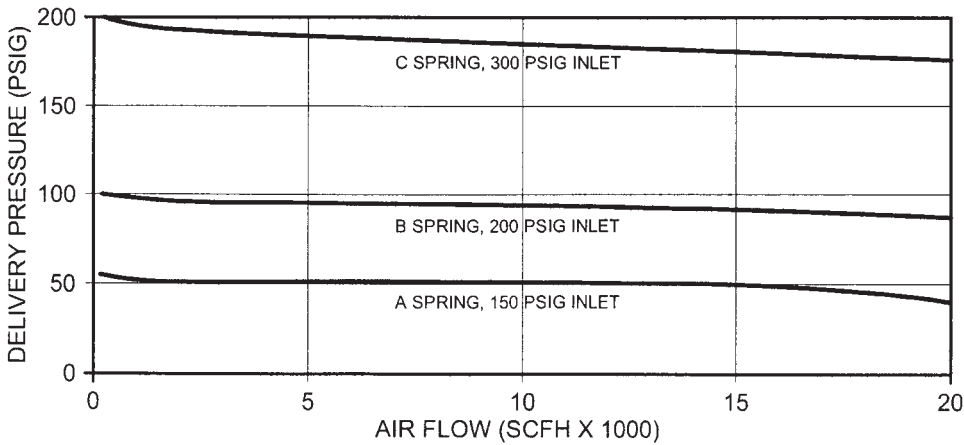
Flow Performance

See the Rego Flow Performance Curves section of the catalog for more detailed flow curves.

BR-1786 & BR-1788



BR-1784



Dimensions

The BR-1780 Series Regulators have inlet and outlet connection dimensions similar to the popular 1680 Series aluminum regulators. This means that you can replace the respective size 1680 Series regulator with the new BR-1780 Series regulator and have the improved performance and premium features available on the BR-1780 Series

For Carbon Dioxide or Nitrous Oxide Service, add "E" to end of part number.

Part Number	Delivery Pressure Range	Pressure Gauge*		Inlet & Outlet (F.N.P.T.)	Dimensions				C _v
		Range (PSI)	P/N		"A"	"B"	"C"	"D"	
BR-1784A	5-55 psig	1-100	1286	1/2"	2.82"	3.62"	1.38"	5.21"	3.1
BR-1784B	40-110 psig	1-200	S1679	1/2"	2.82"	3.62"	1.38"	5.21"	3.1
BR-1784C	100-200 psig	1-400	15578	1/2"	2.82"	3.62"	1.38"	5.21"	3.1
BR-1786A	5-55 psig	1-100	1286	3/4"	3.31"	4.69"	1.60"	6.46"	4.8
BR-1786B	40-110 psig	1-200	S1679	3/4"	3.31"	4.69"	1.60"	6.46"	4.8
BR-1786C	100-200 psig	1-400	15578	3/4"	3.31"	4.69"	1.60"	6.46"	4.8
BR-1788A	5-55 psig	1-100	1286	1"	3.31"	4.69"	1.60"	6.46"	5.5
BR-1788B	40-110 psig	1-200	S1679	1"	3.31"	4.69"	1.60"	6.46"	5.5
BR-1788C	100-200 psig	1-400	15578	1"	3.31"	4.69"	1.60"	6.46"	5.5

*Regulator sold without gauge. Order gauge separately.

Heavy Duty Gas Line Regulator

1780 Series

Application

The 1780 Series Regulators are designed for final line pressure regulation on gas distribution systems. They are suitable for a variety of gases in medical or industrial applications. The 1780 Series Regulators have a balanced seat, are constructed with oxygen compatible materials, and have the same valve design, brass body, and internal parts as the premium BR-1780 Series. Flow performance is likewise equal to the BR-1780 Series.

Features

- Maintains a steady downstream pressure across a range of inlet pressure commonly provided by a cryogenic bulk tank.
- Large seat and diaphragm areas provide high capacity with sensitive control of delivery pressure with low falloff.
- Two 1/4" FNPT delivery pressure gauge ports are located (plugged) on each side of the valve.
- Two bonnet drain/vent holes to allow for different mounting orientation.
- T-handle adjusting screw.
- Maximum inlet pressure is 400 psig.
- Available in three delivery pressure ranges.
- Temperature range: -40 F to 165 F.
- Cleaned per CGA G-4.1 for oxygen service.

Materials

- Body.....Forged Brass
- Bonnet.....Nickel Plated Aluminum
- Diaphragm.....Nitrile with PTFE liner
- Springs and fasteners.....Stainless Steel
- Other valve parts.....Brass
- Seat Disc & O-Rings.....Viton is standard

For Carbon Dioxide or Nitrous Oxide service: Specify EPDM material for seat disc and O-rings, add "E" to end of part number.

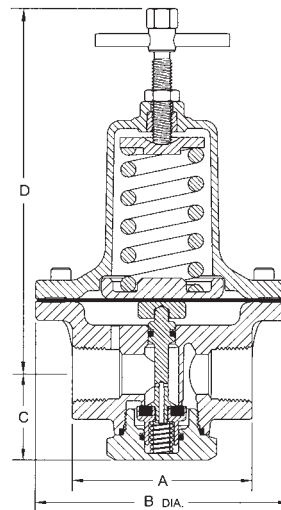
Dimensions

The 1780 Series Regulators have inlet and outlet connection dimensions similar to the popular 1680 Series aluminum regulators. This means that you can replace the respective size 1680 Series regulator with the new 1780 Series regulator and have the improved balanced seat performance.

Ordering Information

Part Number	Delivery Pressure Range	Pressure Gauge* Range (PSI)	P/N	Inlet & Outlet (F.N.P.T.)	Dimensions				Cv
					"A"	"B"	"C"	"D"	
1784A	5-55 psig	1-100	1286	1/2"	2.82"	3.62"	1.38"	5.47"	3.1
1784B	40-110 psig	1-200	S1679	1/2"	2.82"	3.62"	1.38"	5.47"	3.1
1784C	100-200 psig	1-400	15578	1/2"	2.82"	3.62"	1.38"	5.47"	3.1
1786A	5-55 psig	1-100	1286	3/4"	3.31"	4.69"	1.60"	6.84"	4.8
1786B	40-110 psig	1-200	S1679	3/4"	3.31"	4.69"	1.60"	6.84"	4.8
1786C	100-200 psig	1-400	15578	3/4"	3.31"	4.69"	1.60"	6.84"	4.8
1788A	5-55 psig	1-100	1286	1"	3.31"	4.69"	1.60"	6.84"	5.5
1788B	40-110 psig	1-200	S1679	1"	3.31"	4.69"	1.60"	6.84"	5.5
1788C	100-200 psig	1-400	15578	1"	3.31"	4.69"	1.60"	6.84"	5.5

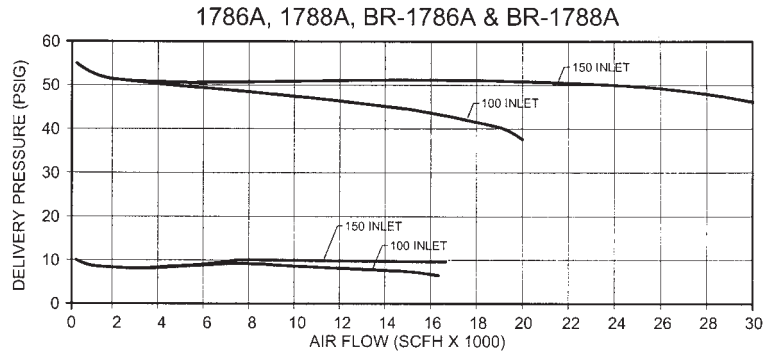
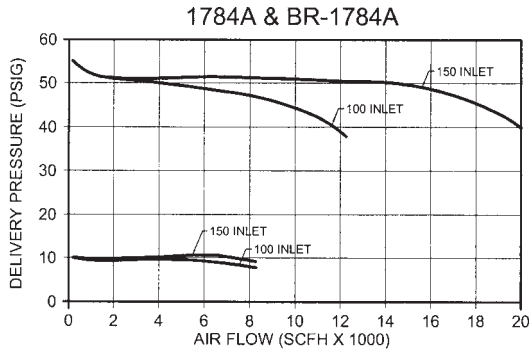
* Regulator sold without gauge. Order gauge separately.



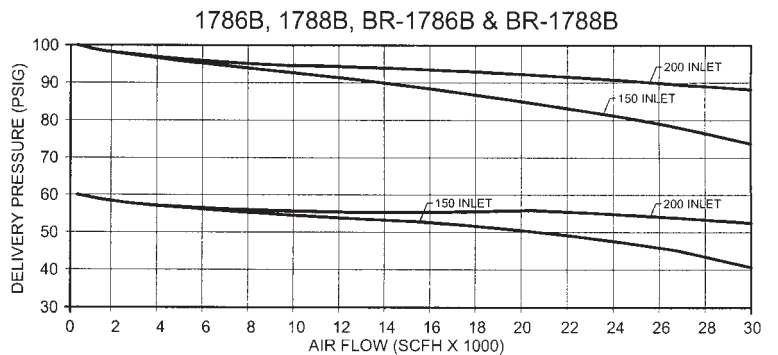
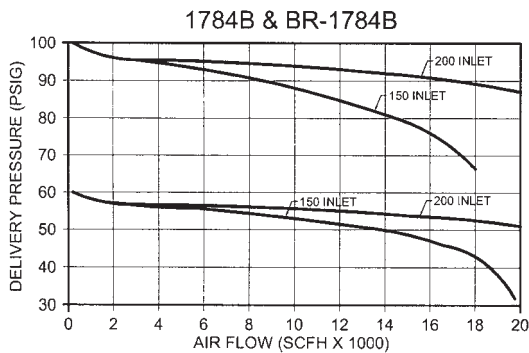
Heavy Duty Line Regulators Performance Curves

1780 Series BR-1780 Series

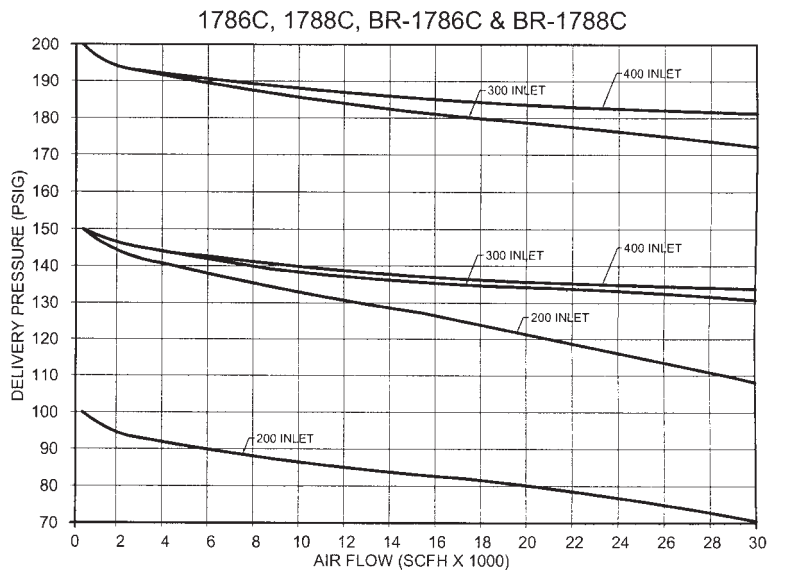
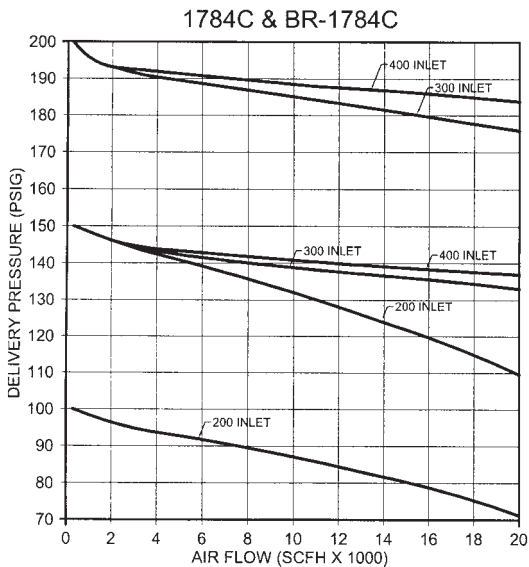
“A” spring range 5 - 55 psig



“B” spring range 40 - 110 psig



“C” spring range 100 - 200 psig



Gas Conversion Table

Service	Multiply Air Capacity By:
Acetylene (15 psi max.)	1.06
Argon	0.85
Carbon Dioxide	0.81

Service	Multiply Air Capacity By:
Fuel Gases	0.86
Helium	2.69
Hydrogen	3.79
Nitrogen	1.02

Service	Multiply Air Capacity By:
Nitrous Oxide	0.81
Oxygen	0.95

Automatic Changeover Regulators

M2523HP Series

Application

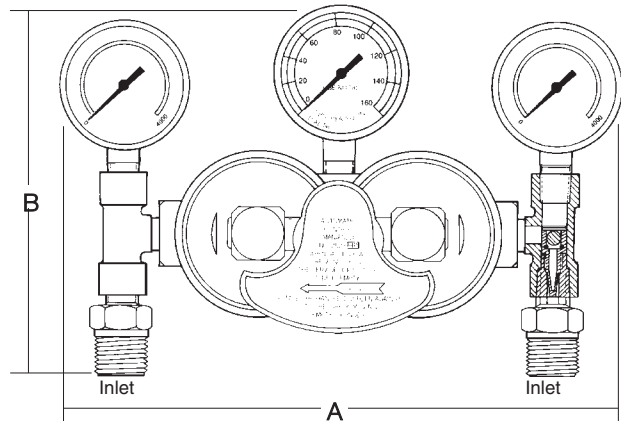
The M2523HP series automatic changeover regulators are designed especially for use in systems where a reserve cylinder is used to provide a continuous, uninterrupted supply of gas. These regulators are suitable for use with carbon dioxide, hydrogen, oxygen, industrial air, nitrous oxide, nitrogen, helium and argon.

Features

- Automatically withdraws from reserve cylinder after exhausting the “service” cylinder.
- Cylinder pressure gauges let you know at a glance which cylinder is in use. There is no need to shutdown the system to replace empty cylinders.
- Nickel plated.
- Porous bronze filters are installed in each inlet to minimize the entry of foreign particles.
- Back pressure check valves are installed in each inlet to help assure positive shut-off in case of reverse flow.
- Each unit comes complete with mounting bracket and a special delivery pressure adjustment wrench.
- Factory set at 50 PSIG on service side. CO₂ and N₂O regulators are factory set at 100 PSIG on service side.

Materials

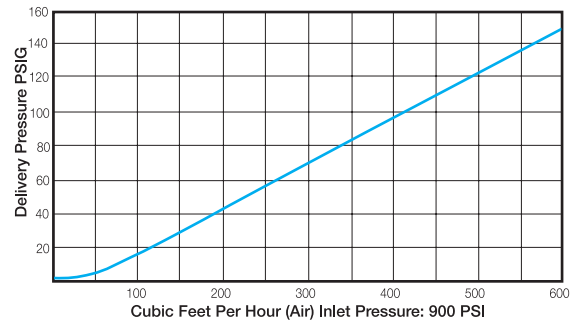
Body.....Brass
 Bonnet.....Brass
 Seat Disc (all gases except CO₂)Viton
 (CO₂ only).....Butyl Rubber
 Diaphragm (all gases except CO₂).....Neoprene
 (CO₂ only).....Buna N
 HandleAluminum
 Bonnet Spring.....Steel
 Backcap SpringStainless Steel



Conversion Table

Service	Multiply
Carbon Dioxide	.81
Nitrogen	1.02
Nitrous Oxide	.81
Argon	.85
Oxygen	.95
Helium	2.69
Hydrogen	3.79

Performance Chart



Ordering Information

Part Number	Gas Service	CGA Inlet Connection	Outlet Connection	Width A	Height B	Maximum Inlet Pressure (PSIG)	Delivery Pressure Range (PSIG)	Accessory Regulators*
M2523HP320	Carbon Dioxide	320	¼" F.NPT	7¼"	5½"	1800	30-130	BR-1784E, 1784E C-1682 M Series
M2523HP326	Nitrous Oxide	326						
M2523HP350	Hydrogen	350						
M2523HP540	Oxygen	540						
M2523HP580	Nitrogen, Argon, Helium	580				1784 Series 1682 M Series BR 1784 Series		

* Can be used downside of the M2523HP as a final line pressure regulator. See pages 22 through 25 and page 29.

Low Pressure Line Regulators

4403 Series

Application

The 4403 series regulators provide very sensitive control of a variety of gases at low pressures. The large molded diaphragm assures responsive regulation with inlet pressures up to 250 PSI.

Features

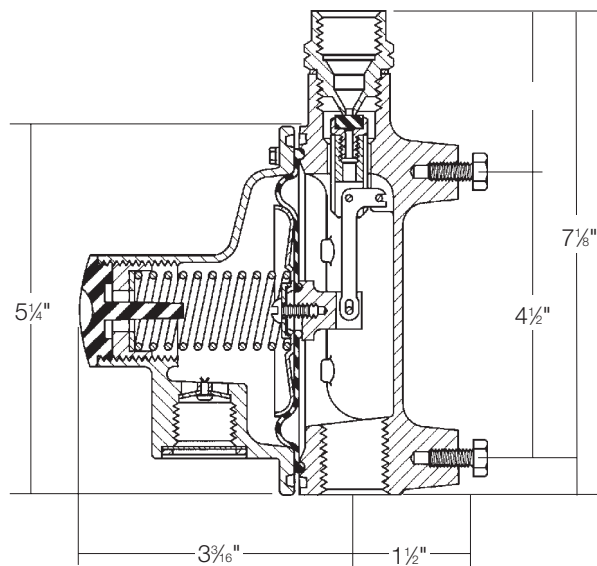
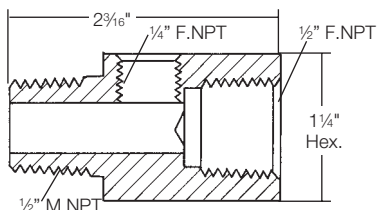
- Large molded diaphragm provides highly sensitive and accurate low pressure control.
- Zinc body and bonnet resist corrosion and provide for longer life.
- Teflon seat disc, teflon faced diaphragms, and stainless steel nozzles make the T4403J regulators compatible with a variety of gases.
- LV4403C2H42 features integral relief valve set at 3 psig.
- Adjusting screw is concealed by a plastic cap which helps prevent pressure adjustments by unauthorized personnel.
- Working temperature range is -40°F to +165°F.

Materials

Body	Zinc
Bonnet	Zinc
Diaphragm ...T4403J, 4403W, S4, T4, U4 Teflon Faced Buna N 4403WP4, R4	Buna N (LV4403C)
Spring	Integrated Fabric and Synthetic Rubber
Seat (T4403J)	Steel
(4403W) (LV4403C)	PTFE
Nozzle (T4403J).....	Buna N
(4403W, LV4403C)	Stainless Steel Brass



1494-1
Pressure
Gauge Adapter



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Factory Delivery Pressure*	Delivery Adjustment Range	Relief Setting
4403W-P4	1/2" F. NPT	1/2" F. NPT	6" w.c.	3.5 - 6" w.c.	None
4403W-R4			25" w.c.	15 - 28" w.c.	
4403W-S4			5 PSIG	1 - 5 PSIG	
4403W-T4			10 PSIG	5 - 10 PSIG	
4403W-U4			15 PSIG	10 - 15 PSIG	
LV4403C2H42	1/4" F. NPT	1/2" F. NPT	1.5 PSIG	1.5 PSIG	3 PSIG ± 20%
T4403JS2			5 PSIG	1 - 5 PSIG	None
T4403JT2			10 PSIG	5 - 10 PSIG	

* Based on 50 PSIG inlet pressure. LV4403C2H42 based on 100 PSIG inlet pressure.

Aluminum Pressure Regulators

1682M Series C-1682M Series

Application

The 1682M Series Regulators are designed primarily for second stage regulation of a variety of gases in industrial piping systems, hospital piping systems and manifold systems.

The C-1682M Series is specifically designed for use with Carbon Dioxide.

Features

- Maximum inlet pressure is 400 PSIG.
- Two 1/4" F.NPT gauge ports are located 180° apart to allow for gauge mounting in the most convenient positions.
- Each 1680M Series regulator is cleaned and packaged per CGA G-4.1.

Materials

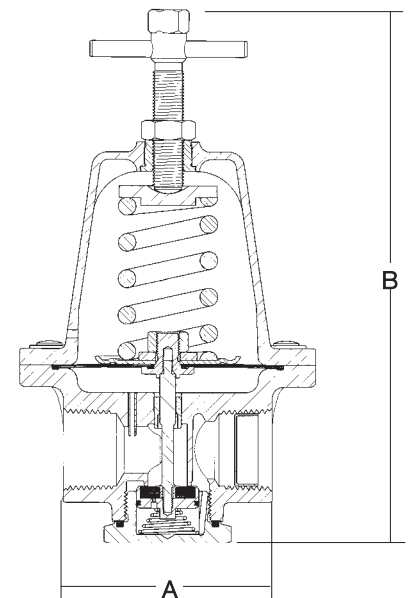
Body.....Forged Aluminum
 Bonnet.....Cast Aluminum
 Seat Disc (1682M).....Neoprene
 (C-1682M).....EPDM
 Diaphragm (1682M).....Neoprene
 (C-1682M).....EPDM



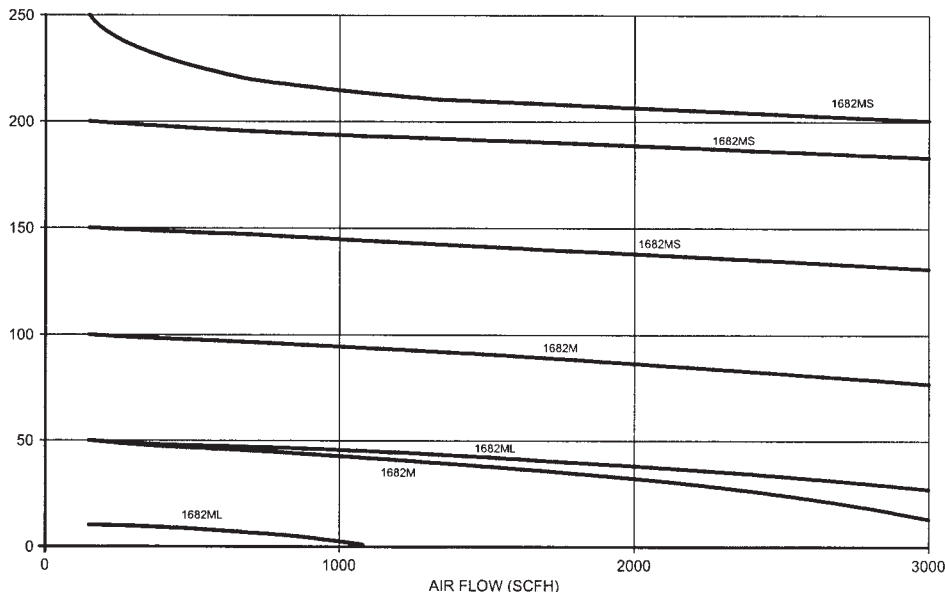
Ordering Information

Part Number		Delivery Pressure Range (PSI)	Pressure Gauge Range (PSI) Part Number		Inlet & Outlet Conn. (F.NPT)	Width A	Maximum Height B
1682ML	C-1682ML	5-50	*	*	1/4"	2 3/16"	4 1/8"
1682MLG	C-1682MLG		1-100	1286			
1682M	C-1682M	50-125	*	*			
1682MG	C-1682MG		1-200	S1679			
1682MS	C-1682MS	100-250	*	*			
1682MSG	C-1682MSG		1-400	15578			

* Pressure gauge not included.



1682M SERIES REGULATOR FLOW PERFORMANCE



Inertrol Outfits

4286 Series 4289 Series 4291 Series

Application

The 4286, 4289, and 4291 series inertrol outfits are three-stage nitrogen regulators especially designed to maintain oil-filled transformer atmospheres at 0.5 PSIG. Each inertrol outfit consists of a two-stage regulator connected in series to a highly sensitive single-stage regulator which maintains the 0.5 PSIG pressure. A built-in pressure relief valve in the third-stage regulator helps protect against over-pressurization of the system.

These inertrol units are designed for oil-filled transformers manufactured by ABB, Inc., General Electric, and Cooper Power. Some outfits are equipped with an alarm switch that activates a customer equipped warning device should the cylinder pressure drop below 3000 PSIG.

Features

- Heavy duty brass and aluminum construction resists corrosion and provides for longer life.
- The 4289 series incorporates a special by-pass valve to allow for quick filling of the transformer.
- Hidden pressure adjusting screw helps protect against tampering by unauthorized personnel.
- Large diameter diaphragm in the third-stage regulator provides for sensitive and precise control of the gas flow.
- Maximum inlet pressure - 3000 PSIG.

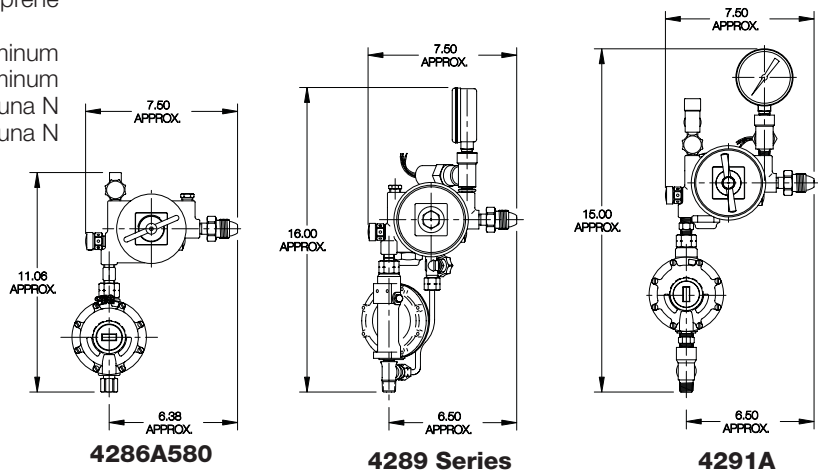
Materials

Two-Stage Regulator:

BodyBrass
BonnetBrass
Diaphragms.....Synthetic Rubber
1st Stage Seat Disc.....Nylon
2nd Stage Seat DiscNeoprene

Third-Stage Regulator:

BodyAluminum
Bonnet.....Aluminum
DiaphragmBuna N
Seat Disc.....Buna N



Ordering Information

Part Number	Gas Service	Inlet	Outlet	Two Stage Regulator Part Number	Third Stage Regulator Part Number	Alarm Gauge	Transformer Manufacturer
4286A580	Nitrogen	CGA580	1/8" NPT	4286A-2NW	4286-10-8	None	ABB, Inc.
4289AG			3/8" -18 L.H.	4289A-2G	4289-10	4285-9B	General Electric
4289G						None	
4291A			3/8" NPT	4291B-2	4286-10-8	4285-9B	Cooper Power

Low Pressure Regulators

4286-10 Series 4289-10 Series

Application

The 4286 and 4289 series inertrol third-stage low pressure regulators are designed especially for secondary regulation of gaseous nitrogen on electrical transformer systems.

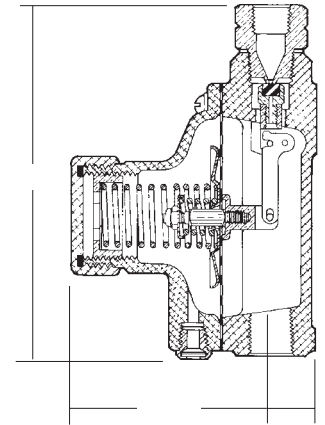
These regulators are factory preset at 14" to 15" water column delivery pressure with an inlet pressure of 5 to 10 PSIG.

Features

- Large diaphragm allows for highly sensitive and accurate low pressure control.
- Incorporates integral relief valves (except on 4289-10).
- Aluminum body and bonnet resist corrosion and provide longer life.
- Adjusting screw is concealed by a cap to help prevent against tampering by unauthorized personnel.
- Operating temperature range is -40°F to +160°F.

Materials

Body.....Aluminum
 Bonnet.....Aluminum
 Diaphragm.....Buna N
 Seat Disc.....Buna N
 SpringSteel



Ordering Information

Part Number	Inlet (NPT)	Outlet (NPT)	Delivery Pressure Setting	Relief Valve Setting
4286-10-5	1/4"	3/8"	14"-15" w. c.	5 PSIG
4286-10-8				8 PSIG
4289-10				None

Alarm Gauges

4285-9B

Application

The 4285-9B inertrol alarm gauges are designed to alert the user when pressure has fluctuated ±90 PSIG from the 300 PSIG factory setting. Under these conditions, electrical contacts in the switch will close and set off a user-furnished alarm system.

Features

- Solid brass gauge casing resists corrosion and provides for longer life.
- Equipped with a heavy-duty, 36" long, 3-wire electrical cable.
- Each gauge is factory pre-set at 300 PSIG, then sealed to help prevent against tampering once in service.
- Electrical circuit is rated for a maximum of 3 AMPS at 460 volts AC.

Materials

Gauge CasingBrass

Ordering Information

Part Number	Inlet M.NPT	Diameter	Pressure Range (PSIG)	Adjustable	Alarm Furnished
4285-9B	1/4"	2 1/2"	0-4000	No	None

