

**PurityPlus**  
SPECIALTY GASES

**SPECIALTY GASES & EQUIPMENT CATALOG**

**PURITYPLUS DISTRIBUTION CENTERS  
LOCATED THROUGHOUT NORTH AMERICA**

PurityPlus is supplied through a network of Independent Distributor Members known as the IWDC – a 60 year old North American cooperative of producers and distributors of specialty gases.

With over 140 members and more than 800 locations, no matter where you are throughout the U.S., Canada, and Mexico, a local PurityPlus distribution center will be ready to provide quick and dedicated service. Corporations with operations in multiple locations can rely on the exclusive network of PurityPlus producers to ensure that each of their facilities receive the same high quality gases and gas mixtures, with the same stringent specifications, wherever

[WWW.PURITYPLUSGASES.COM](http://WWW.PURITYPLUSGASES.COM)

**PurityPlus**<sup>®</sup>

SPECIALTY GAS. THERE WHEN YOU NEED IT.



**SPECIALTY  
GASES &  
EQUIPMENT  
CATALOG**

**THIRD EDITION**

## Table Of Contents

<b>Introduction</b> .....	i-vi	Trimethylamine (TMA).....	1.52
<b>Section 1: Pure Gases</b>		Xenon.....	1.53
Acetylene.....	1.1	<b>Section 2: Mixed Gases</b>	
Air.....	1.2	Introduction.....	2.1
Ammonia.....	1.3	Mixture Specifications.....	2.2
Argon.....	1.4	Ammonia.....	2.3
Boron Trichloride.....	1.5	Argon.....	2.4 – 2.7
Boron Trifluoride.....	1.6	n-Butane.....	2.8 – 2.10
1,3-Butadiene.....	1.7	Carbon Dioxide.....	2.11 – 2.14
n-Butane.....	1.8	Carbon Monoxide.....	2.15 – 2.16
1-Butene.....	1.9	Ethane.....	2.17 – 2.18
CIS-2-Butene.....	1.10	Ethylene.....	2.19 – 2.20
Carbon Dioxide.....	1.11	Helium.....	2.21 – 2.22
Carbon Monoxide.....	1.12	Hexane.....	2.23
Carbonyl Sulfide.....	1.13	Hydrogen.....	2.24 – 2.27
Chlorine.....	1.14	Hydrogen Sulfide.....	2.28
Deuterium.....	1.15	Isobutane.....	2.29 – 2.30
Dimethyl Ether (DME).....	1.16	Methane.....	2.31 – 2.34
Ethane.....	1.17	Nitric Oxide.....	2.35
Ethylene.....	1.18	Nitrogen.....	2.36 – 2.38
Helium.....	1.19	Nitrogen Dioxide.....	2.39
Hexafluoroethane (R116).....	1.20	Nitrous Oxide.....	2.40
Hexafluoropropylene.....	1.21	Oxygen.....	2.41 – 2.42
Hydrogen.....	1.22	n-Pentane.....	2.43
Hydrogen Bromide.....	1.23	Propane.....	2.44 – 2.45
Hydrogen Chloride.....	1.24	Propylene.....	2.46 – 2.47
Hydrogen Sulfide.....	1.25	Sulfur Dioxide.....	2.48 – 2.49
Isobutane.....	1.26	Sulfur Hexafluoride.....	2.50 – 2.51
Isobutylene.....	1.27	Three Component Mixtures.....	2.52
Isopentane.....	1.28	<b>Section 3: Special Application Mixtures</b>	
Krypton.....	1.29	Beverage and Food Gases.....	3.1 – 3.2
Methane.....	1.30	Biological Atmosphere Gas Mixtures.....	3.3
Methyl Chloride.....	1.31	Electron Capture Mixtures.....	3.4
Methyl Fluoride.....	1.32	Nuclear Counter Mixtures.....	3.4
Methyl Mercaptan.....	1.33	EPA Protocol Mixtures.....	3.5
Monomethylamine (MMA).....	1.34	Portable Calibration Standards.....	3.6 – 3.8
Neon.....	1.35	Flame Ionization Fuel Mixtures.....	3.9
Neopentane (Dimethylpropane).....	1.36	Leak Detection Mixtures.....	3.9
Nitric Oxide.....	1.37	Laser Mixtures.....	3.10
Nitrogen.....	1.38	TCD Carrier Gas Mixture.....	3.11
Nitrogen Dioxide.....	1.39	Spark Chamber Mixtures.....	3.11
Nitrogen Trifluoride.....	1.40	Multicomponent Hydrocarbon Mixtures.....	3.12
Nitrous Oxide.....	1.41	Liquid Hydrocarbon Mixtures.....	3.13
Octafluorocyclobutane (R318).....	1.42	Semiconductor Gases.....	3.14
Octafluoropropane (HC-218).....	1.43	Medical Gases.....	3.15– 3.18
Oxygen.....	1.44	<b>Section 4: Equipment</b> .....	4.1 - 4.210
Propane.....	1.45	Detailed Index listed after Section 4 page divider	
Propylene.....	1.46	<b>Section 5: Technical Information</b>	
Sulfur Dioxide.....	1.47	Gas Safety and Material	
Sulfur Hexafluoride.....	1.48	Compatibility Data Chart.....	5.1 - 5.2
Tetrafluoromethane (HC-14).....	1.49	Conversion Factors.....	5.3 - 5.4
Trans-2-Butene.....	1.50	Gases CGA Selection Chart.....	5.5
Trifluoromethane (R23).....	1.51	<b>Section 6: Glossary</b> .....	6.1 - 6.2

## How to Use This Catalog

### Section 1 – Pure Gases

Pure gases are listed in alphabetical order. Additional products are available upon request. If you do not see your requirement listed, please contact the nearest PurityPlus sales office.

Many Specialty Gas products are available in bulk quantities. If you need special size cylinders, manifolded cylinder banks, ton containers, tube trailers or cryogenic trailers, please contact the nearest PurityPlus sales office.

### Section 2 – Mixed gases

Two Component Mixtures are listed alphabetically by MINOR component. Standard balance gases are listed. Additional balance gases may be available. Please check with our technical staff.

Three Component Mixtures – Common components and balance gases listed.

### Section 3 – Special Application Mixtures

These common mixtures are listed by use.

### Section 4 – Equipment

Specialty Gas Handling Equipment is listed by type of product, i.e. regulators, flowmeters, etc. There is an index at the beginning of the section.

Equipment recommendations for each gas can also be found on the product pages with a reference to the proper catalog page.

### Section 5 – Technical Information

Material Compatibility Chart  
Unit Conversion Tables

### Section 6 – Glossary

## Introduction

PurityPlus Specialty Gases and Gas Handling Equipment are offered by the Independent Welding Distributor Cooperative (IWDC) to their customers in North America. Over 150 Independent Distributors in North America are proud to offer this quality brand of Specialty Gases. The quality of PurityPlus Specialty Gases combined with the service and dependability of our Independent Distributors are unequalled by anyone. Most of our family owned businesses have been servicing their customers for the better part of a century.

The map on page vi shows the distribution points available to the IWDC. Many products are already stock items for our customers. Please check with the nearest sales office to see if they can stock products for your requirements.

We have over twenty producing laboratories in North America. The combined technical experience of our laboratory personnel and our state-of-the-art facilities allow us to provide you with the best product for your application.

**Quality Assurance:** To ensure that you receive only the highest quality products, our producing laboratories exercise strict QA inspection standards for incoming material and maintain the most stringent quality control throughout the entire production process.

**Availability and Service:** With over 150 Independent Distributors with over 600 locations throughout North America, IWDC has one of the largest networks to supply your specialty gas and equipment requirements. Many of the hundreds of products that we offer are stocked locally for our customers. Please contact your local sales office if you have a need to stock additional products or package sizes. We pride ourselves on our ability to service our customers. We can meet many special delivery needs. Please contact us if you have any special requirements.

**Nonstandard Containers and Products:** Many of the products listed are available in special non-standard containers. Many products are also available in bulk and mini-bulk quantities. This includes tube trailers, liquid trailers, liquid cylinders, manifolded cylinder skids, ton containers and more. Additionally, non-standard and special order specialty gases may also be available. This is especially true for gas mixtures. We are able to supply many different non-standard liquid and gas components with various balance gases, taking physical or safety limitations into consideration. Please contact the nearest sales office for availability and pricing.

**Gas Handling Equipment:** We carry only the highest quality gas handling equipment from regulators to filters to cylinder gas manifolds. Please refer to the recommended equipment for each gas that you need. Please contact us if you have any questions as to how to safely handle the products you are using.

## Product Safety

The gases available through this catalog are hazardous. Some of the gases are flammable, toxic, or corrosive. As with any chemical or compressed gas improper use can cause serious injury or even death. Please be sure to review all available safety precautions when handling these gases, including the applicable Material Safety Data Sheet which is provided with each gas product. If you have any questions regarding the safe handling or use of any product we supply, please contact the nearest PurityPlus Sales Office.

Additional safety information is available from the Compressed Gas Association, DOT regulations, and applicable OSHA guidelines. Many other industry associated references are available to review the safety requirements for the handling and storage of industrial and specialty gases.

## Terms and Conditions

The PurityPlus producers have the following terms and conditions for the sales of the products in this catalog. All sales of the products listed in this catalog shall be governed by these terms and conditions.

- 1. Terms of sale.** Gas prices are FOB stocking point unless otherwise noted. All freight, handling, and additional related charges relating to the shipment of these products will be at the account of the Purchaser. Purchaser will pay the sales, use or excise tax imposed on the sales or delivery of these products. Terms of payment will be net 15 days from date of invoice. Seller reserves the right to increase or decrease prices from time to time. Seller's price in effect at time of shipment will apply to all orders. There is a minimum charge of \$50.00 per invoice (excluding cylinder rent or demurrage).
- 2. Warranty.** Gases - Seller warrants that the products will meet the specifications listed in this catalog. Gas products will be adequately packaged and labeled in accordance with all appropriate regulations and industry standards. Equipment will be free from defects in material and workmanship. Purchaser shall inspect and examine each shipment upon receipt, and, unless a written claim is delivered to Seller within 10 days thereafter, all claims with respect to said shipment or the products contained therein shall be conclusively deemed waived and Purchaser shall be conclusively deemed to have accepted delivery of such product and that Seller is in full compliance with all of the obligations to Purchaser with respect to such product. No claim against the seller shall be made, whether or not based on negligence or warranty, shall exceed the purchase price of the product. THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SPECIFIED IN THIS PARAGRAPH. SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, IN FACT OR BY LAW, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.
- 3. WARNING!** SELLER WARNS PURCHASER THAT THERE ARE HAZARDS ASSOCIATED WITH THE USE OF THE PRODUCTS LISTED IN THIS CATALOG. PURCHASER ACKNOWLEDGES THAT THERE ARE HAZARDS ASSOCIATED WITH THE USE AND STORAGE OF THESE PRODUCTS OR EQUIPMENT, THAT IT UNDERSTANDS SUCH HAZARDS, AND THAT IT IS THE RESPONSIBILITY OF THE PURCHASER TO WARN AND PROTECT ITS EMPLOYEES AND OTHERS EXPOSED TO SUCH HAZARDS THROUGH THE STORAGE AND USE OF THESE PRODUCTS OR EQUIPMENT. PURCHASER ASSUMES ALL RISK AND LIABILITY FOR LOSS, DAMAGES OR INJURY TO PERSONS OR TO PROPERTY ARISING FROM THE PRESENCE OR USE OF THESE PRODUCTS OR EQUIPMENT. SELLER SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ASSOCIATED WITH THE USE OR MISUSE OF THESE PRODUCTS OR EQUIPMENT. Determination of the suitability of the products purchased and the results of using product alone or in combination with other articles or substances and in any manufacturing, medical, or other process or procedure is the sole responsibility of Purchaser. Seller shall have no responsibility in connection therewith.
- 4. Contingencies.** Neither the seller nor purchaser will be liable to the other for default or delay in the performance of any of their obligations to each other in connection with the purchase, sale, shipment or delivery of the products due to an Act of God, accident, fire, flood, storm, riot, war, sabotage, explosion, strike or other labor disturbance, national defense requirement, governmental law, ordinance, rule or regulation, inability to obtain electricity, or other type of energy, raw material, labor, equipment or transportation, or any other contingency beyond their reasonable control.
- 5. Cylinders.** Most gas products will be supplied in Seller owned, returnable cylinders. There may be a charge for the use of these cylinders. Purchaser will return these cylinders to the Seller in a non-contaminated condition with all valves tightly closed. If dust plugs or dust caps have been provided, these must be reinstalled and securely tightened to the cylinder valve outlet. Cylinder caps must be in place and securely tightened. All returnable cylinders will remain the property of the seller at all times. Purchaser will pay seller for any damage beyond normal wear and tear while in the possession of the Purchaser. This does not apply to any non-returnable or disposable container. ALL CYLINDERS MUST BE RETURNED FREIGHT PREPAID. Purchaser will be charged current replacement cost for any lost cylinders.

**CYLINDER DATA AND CROSS REFERENCE CHART**

PurityPlus	DOT Number	Size (inches)	Tare Weight (pounds)	Water Volume (cu. ft.)	Airgas	BOC/ Linde	Air Products	Praxair	Scott	Matheson	Air Liquide
300	3AA2400	9x60	143	1.73	300	300	A	T	K	IL	49
200	3AA2015	9x56	133	1.54	200	200	B	K	A	IA	44
80	3AA2015	8.5x31	65	0.52	80	80	C	Q	B	2	16
30	3AA2015	6x24	29	0.26	35	30	D1	G	C	3	7
10	3AA2015	4x20	10	0.11	10	12	D	F	D	4	3
LB	3E1800	2x16	4	0.015	LB	2	LB	LB	LB	LB	LB
ELB	3E1800	2x16	4	0.015	LX	7X	LG	ELB		7X	
E	3AA2015	4.5x31	13	0.17	E	E	Med.E	ANE	ER		MEDE
AA380	8AL	12x8	195	N/A	380	5	A	Lab380	XF	IB	380
LP300	4BW240	15x48	75	3.83	350		A1	FX	XL	1F	350
LP150	4AA480	15x52	151	4.46	150	150	AA	FA	XG	1K	150
LP60	4BA300	10x53	55	1.97	65		A3	FC	XP	IJ	65
6000	3AA-6000	10x51	303	1.5	3HP	485		6K		1U	44H
3500	3AA-3600	9.25x51	189	1.54	2HP			3K		1H	
AL150	3AL2015	8x53	48	1.04	150A	150A	B(AL)	ALS	AI	1R	30AL
AL80	3AL2015	7x38	30	0.55	80A	80A	C(AL)	ALQ	BL	2R	22AL
AL30	3AL2015	7x21	9	0.14	33A	30A	DL(AL)	ALH	CL	3R	7AL

**Compressed Gas Cylinders**



**Low Pressure Cylinders**



LOW PRESSURE LIQUID CYLINDERS

<b>Specifications</b>											
MODEL SIZE		160L	160L	180L	180L	200L	200L	230L	230L	265L	265L
	Pressure	MP	HP	MP	HP	MP	HP	MP	HP	MP	HP
LCCM	Part Number	10508748	10508756	10508764	10496433	10508772	10496417	10496468	10496492	10510039	10512561
MCR	Part Number	10783424	10783467	10783491	10783539	10783598	10783619	10783635	10783651	10783678	10783694
<b>CAPACITY</b>											
Liquid (Gross)	(liters)	176	176	196	196	209	209	240	240	276	276
Liquid (Net)	(liters)	165	165	185	185	196	196	230	230	265	265
Gas (N <sub>2</sub> )*	ft <sup>3</sup> / Nm <sup>3</sup>	3685 / 97	3464 / 91	4099 / 108	3864 / 102	4375 / 115	4072 / 108	5024 / 132	4734 / 124	5769 / 152	5438 / 143
Gas (O <sub>2</sub> )*	ft <sup>3</sup> / Nm <sup>3</sup>	4577 / 120	4348 / 114	5096 / 134	4843 / 127	5435 / 143	5048 / 133	6244 / 164	5930 / 156	7186 / 189	6811 / 179
Gas (Ar)*	ft <sup>3</sup> / Nm <sup>3</sup>	4448 / 117	4226 / 111	4961 / 130	4709 / 124	5290 / 139	4932 / 130	6073 / 160	5763 / 151	6982 / 183	6634 / 174
Gas (CO <sub>2</sub> )*	ft <sup>3</sup> / Nm <sup>3</sup>	--	3382 / 89	--	3766 / 99	--	4011 / 105	--	4614 / 121	--	5305 / 139
Gas (N <sub>2</sub> O)*	ft <sup>3</sup> / Nm <sup>3</sup>	--	3207 / 84	--	3574 / 94	--	3810 / 100	--	4378 / 115	--	5034 / 132
<b>PERFORMANCE</b>											
NER (N <sub>2</sub> )	% per day	2	2	1.9	1.9	1.85	1.85	1.8	1.8	2	2
NER (O <sub>2</sub> - Ar)	% per day	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.4	1.4
NER (CO <sub>2</sub> - N <sub>2</sub> O)	% per day	--	0.5	--	0.5	--	0.5	--	0.5	--	0.5
Gas Flow (N <sub>2</sub> , O <sub>2</sub> , Ar)	ft <sup>3</sup> /hr / Nm <sup>3</sup> /hr	350 / 9.2	350 / 9.2	350 / 9.2	350 / 9.2	400 / 10.5	400 / 10.5	400 / 10.5	400 / 10.5	400 / 10.5	400 / 10.5
Gas Flow (CO <sub>2</sub> , N <sub>2</sub> O)	ft <sup>3</sup> /hr / Nm <sup>3</sup> /hr	--	110 / 2.9	--	110 / 2.9	--	110 / 2.9	--	110 / 2.9	--	110 / 2.9
<b>DIMENSIONS &amp; PRESSURE RATINGS</b>											
Relief Valve Setting	psig / barg	230 / 16	350 / 24	230 / 16	350 / 24	230 / 16	350 / 24	230 / 16	350 / 24	230 / 16	350 / 24
DOT/CTC Rating		4L200	4L292	4L200	4L292	4L200	4L292	4L200	4L292	4L200	4L292
Diameter	in / cm	20/50.8	20/50.8	20/50.8	20/50.8	20/50.8	20/50.8	26/66.0	26/66.0	26/66.0	26/66.0
Height	in / cm	59.6 / 151.3	59.6 / 151.3	63.5 / 161.3	63.5 / 161.3	65.8 / 167.1	65.8 / 167.1	52.9 / 131.9	52.9 / 131.9	57.8 / 146.8	57.8 / 146.8
Empty Weight	lb / kg	250 / 113.4	280 / 126.9	260 / 117.9	300 / 136.1	280 / 126.9	320 / 145.1	300 / 136.1	340 / 154.2	340 / 154.2	360 / 163.6
Full Weight (N <sub>2</sub> )	lb / kg	517 / 234	531 / 241	557 / 253	580 / 263	597 / 271	618 / 280	664 / 301	683 / 310	758 / 344	754 / 343
(O <sub>2</sub> )	lb / kg	629 / 285	640 / 290	682 / 309	701 / 318	730 / 331	747 / 339	817 / 370	831 / 377	935 / 424	924 / 420
(Ar)	lb / kg	710 / 322	717 / 325	773 / 351	787 / 357	827 / 375	839 / 380	928 / 421	936 / 424	1062 / 481	1046 / 475
(CO <sub>2</sub> )	lb / kg	--	667 / 303	--	731 / 331	--	779 / 353	--	868 / 393	--	967 / 439
<i>*At relief valve settings</i>											

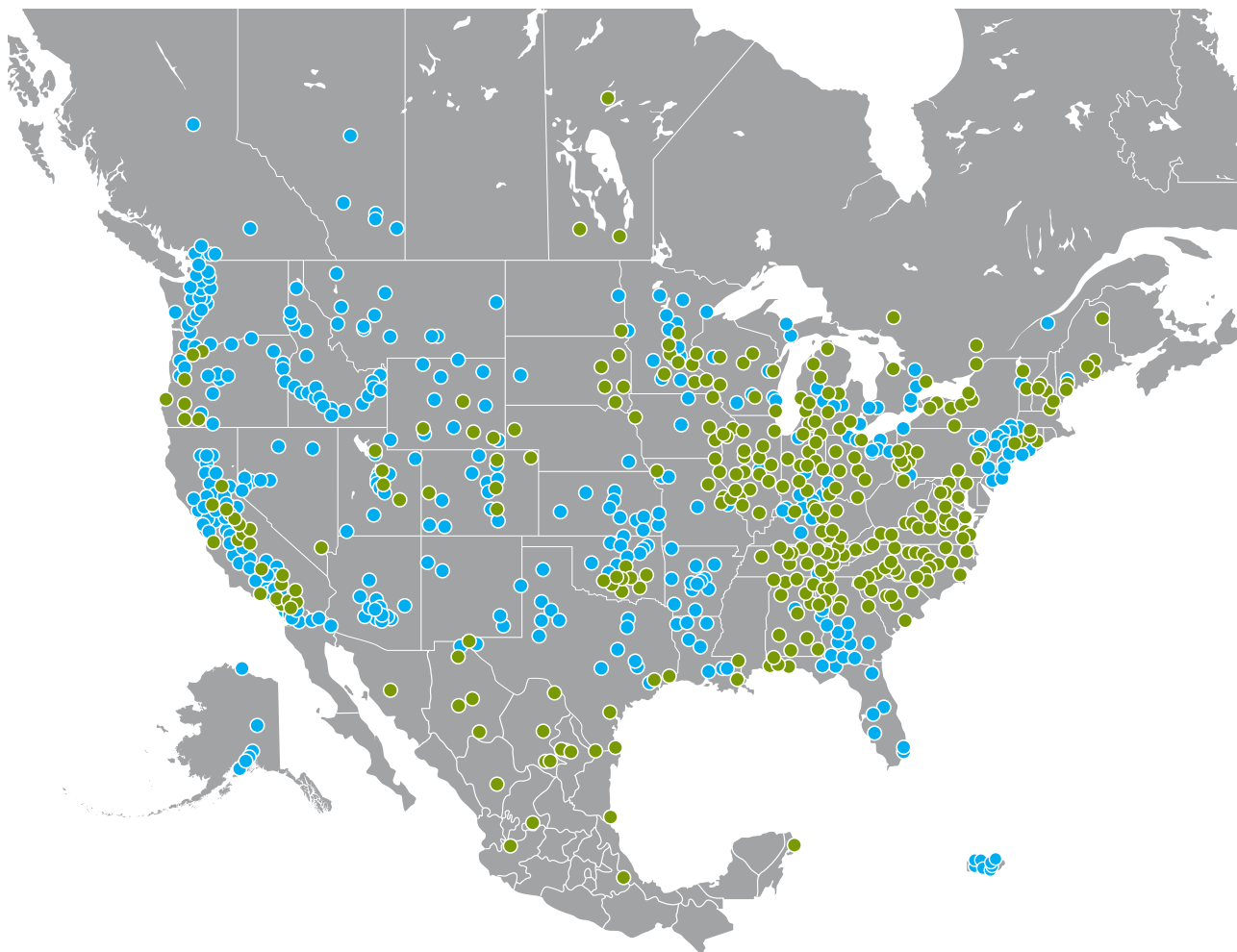




---

## PurityPlus Distribution Centers Located Throughout North America

PurityPlus is supplied through a network of Independent Distributor Members known as the IWDC – a 60 year old North American cooperative of producers and distributors of specialty gases



With over 150 members and more than 600 locations, no matter where you are throughout the U.S., Canada, and Mexico, a local PurityPlus distribution center will be ready to provide quick and dedicated service. Corporations with operations in multiple locations can rely on the exclusive network of PurityPlus producers to ensure that each of their facilities receive the same high quality gases and gas mixtures, with the same stringent specifications, wherever they are.



# PURE GASES

 **PurityPlus**<sup>®</sup>  
SPECIALTY GASES

## Section 1 - Pure Gases

Gas	Page Number	Gas	Page Number
Acetylene	1.1	Isopentane	1.28
Air	1.2	Krypton	1.29
Ammonia	1.3	Methane	1.30
Argon	1.4	Methyl Chloride	1.31
Boron Trichloride	1.5	Methyl Fluoride	1.32
Boron Trifluoride	1.6	Methyl Mercaptan	1.33
1,3-Butadiene	1.7	Monomethylamine (MMA)	1.34
n-Butane	1.8	Neon	1.35
1-Butene	1.9	Neopentane (Dimethylpropane)	1.36
CIS-2-Butene	1.10	Nitric Oxide	1.37
Carbon Dioxide	1.11	Nitrogen	1.38
Carbon Monoxide	1.12	Nitrogen Dioxide	1.39
Carbonyl Sulfide	1.13	Nitrogen Trifluoride	1.40
Chlorine	1.14	Nitrous Oxide	1.41
Deuterium	1.15	Octafluorocyclobutane (R318)	1.42
Dimethyl Ether (DME)	1.16	Octafluoropropane (HC-218)	1.43
Ethane	1.17	Oxygen	1.44
Ethylene	1.18	Propane	1.45
Helium	1.19	Propylene	1.46
Hexafluoroethane (R116)	1.20	Sulfur Dioxide	1.47
Hexafluoropropylene	1.21	Sulfur Hexafluoride	1.48
Hydrogen	1.22	Tetrafluoromethane (HC-14)	1.49
Hydrogen Bromide	1.23	Trans-2-Butene	1.50
Hydrogen Chloride	1.24	Trifluoromethane (R23)	1.51
Hydrogen Sulfide	1.25	Trimethylamine (TMA)	1.52
Isobutane	1.26	Xenon	1.53
Isobutylene	1.27		

A colorless, highly flammable gas.

## Acetylene

Technical Information:	
Chemical Symbol:	C <sub>2</sub> H <sub>2</sub>
Molecular Weight:	26.04
Specific Volume	14.7 ft <sup>3</sup> /lb (0.91 m <sup>3</sup> /kg)
CAS Registry Number:	74-86-2

Shipping Information:	
DOT Proper Name:	Acetylene, dissolved
Hazard Class:	2.1
I.D. Number:	UN 1001
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus Purified 2.6 (For Atomic Absorption)</b>	ACE-26-XXX	99.6%	Oxygen plus CH <sub>4</sub> PH <sub>3</sub>	< 4000 ppm < 20 ppm	200 series brass regulator see page 4.8

XXX - Complete the part number with the desired cylinder size listed below. (ie. ACE-26-380)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
380	330	250	510
140	130	250	510

\*Nonstandard cylinder sizes available upon request

## Air

A colorless, odorless, nonflammable gas.

Technical Information:	
Chemical Symbol:	N/A
Molecular Weight:	28.96
Specific Volume	13.3 ft <sup>3</sup> /lb (0.83 m <sup>3</sup> /kg)
CAS Registry Number:	132259-10-0

Shipping Information:	
DOT Proper Name:	Air, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1002
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus Ultra Zero</b>	AIR-UZ-XXX		Total Hydrocarbons Moisture Oxygen Carbon Dioxide Carbon Monoxide	< 0.1 ppm < 3 ppm 19.5% to 23.5% < 1 ppm < 1 ppm	300 series brass regulator see page 4.12
<b>PurityPlus Zero</b>	AIR-ZE-XXX		Total Hydrocarbons Oxygen	<1 ppm 19.5% to 23.5%	300 series brass regulator see page 4.12
<b>PurityPlus Extra Dry</b>	AIR-ED-XXX		Moisture Oxygen	< 8 ppm 19.5% to 23.5%	200 series brass regulator see page 4.8

XXX - Complete the part number with the desired cylinder size listed below. (ie. AIR-UZ-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	311	2640	590
200	233	2200	590
80	88	2200	590

\*Nonstandard cylinder sizes available upon request

A colorless, pungent, toxic gas.

## Ammonia

Technical Information:	
Chemical Symbol:	NH <sub>3</sub>
Molecular Weight:	17.03
Specific Volume	22.6 ft <sup>3</sup> /lb (1.41 m <sup>3</sup> /kg)
CAS Registry Number:	7664-41-7

Shipping Information:	
DOT Proper Name:	Ammonia, Anhydrous
Hazard Class:	2.2
I.D. Number:	UN 1005
Labels:	Non-Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus VLSI 4.5 (Liquid Phase)</b>	AMM-VL-XX	99.995%	Oil Moisture	< 0.5 ppm < 3 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 2.5 (Liquid Phase)</b>	AMM-25-XX	> 99.5%	Total Impurities	< 0.5%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. AMM-VL-400)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure PSIG	CGA Valve Connection
400	150	114	660/240
150A	30	114	660/705
80A	15	114	660/705
33A	7	114	660/705

\*Nonstandard cylinder sizes available upon request

## Argon

A chemically inert, colorless, odorless, nontoxic gas.

Technical Information:	
Chemical Symbol:	Ar
Molecular Weight:	39.948
Specific Volume	9.7 ft <sup>3</sup> /lb (0.606 m <sup>3</sup> /kg)
CAS Registry Number:	7440-37-1

Shipping Information:	
DOT Proper Name:	Argon, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1006
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 6.0 (Research)</b>	ARG-60-XX	99.9999%	Oxygen Moisture Nitrogen Total Hydrocarbons Carbon Monoxide Carbon Dioxide	< 0.2 ppm < 0.2 ppm < 0.4 ppm < 0.1 ppm < 0.1 ppm < 0.1 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 5.5 (Chromatograph)</b>	ARG-55-XX	99.9995%	Oxygen Moisture Nitrogen Total Hydrocarbons	< 1 ppm < 1 ppm < 3 ppm < 0.1 ppm	300 series brass regulator see page 4.12
<b>PurityPlus N<sub>2</sub> Free 5.0</b>	ARG-NF-XX	99.999%	Oxygen Moisture Nitrogen Total Hydrocarbons	< 2 ppm < 2 ppm < 4 ppm < 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 5.0 (Ultra High Purity)</b>	ARG-50-XXX	99.999%	Oxygen Moisture Total Hydrocarbons	< 1 ppm < 1 ppm < 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.8 (Prepurified)</b>	ARG-48-XXX	99.998%	Oxygen Moisture Total Hydrocarbons	< 5 ppm < 5 ppm < 2 ppm	300 series brass regulator see page 4.12
<b>PurityPlus Zero 4.8</b>	ARG-ZE-XXX	99.998%	Total Hydrocarbons	< 0.5 ppm	300 series brass regulator see page 4.12

XXX - Complete the part number with the desired cylinder size listed below. (ie. ARG-60-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	337 / 9.37	2640	580
200	250 / 6.79	2200	580
80	83 / 2.3	2200	580

\*Nonstandard cylinder sizes available upon request

A colorless, toxic, corrosive gas shipped as a liquid under its own vapor pressure.

## Boron Trichloride

Technical Information:	
Chemical Symbol:	BCl <sub>3</sub>
Molecular Weight:	117.17
Specific Volume	3.3 ft <sup>3</sup> /lb (0.202 m <sup>3</sup> /kg)
CAS Registry Number:	10294-34-5

Shipping Information:	
DOT Proper Name:	Boron Trichloride
Hazard Class:	2.3
I.D. Number:	UN1741
Labels:	Poison Gas, Corrosive

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	BTC-50-XX	> 99.999%	Total Impurities	< 10 ppm	Series 8500 stainless steel manual control valve see page 4.130
<b>PurityPlus 3.0 (Electronic)</b>	BTC-30-XX	> 99.9%	Total Impurities	< 1000 ppm	
<b>PurityPlus 2.5 (Chemically Pure)</b>	BTC-25-XX	> 99.5%	Total Impurities	< 0.5%	
Higher grades available upon request.					

XX - Complete the part number with the desired cylinder size listed below. (ie. BTC-50-200)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure PSIG	CGA Valve Connection
200	100	4.4	660
35	14	4.4	660
LB	1	4.4	660

\*Nonstandard cylinder sizes available upon request



## Boron Trifluoride

A nonflammable, toxic and corrosive gas.

Technical Information:	
Chemical Symbol:	BF <sub>3</sub>
Molecular Weight:	67.781
Specific Volume	5.6 ft <sup>3</sup> /lb (0.350 m <sup>3</sup> /kg)
CAS Registry Number:	7637-07-2

Shipping Information:	
DOT Proper Name:	Boron Trifluoride, Compressed
Hazard Class:	2.3
I.D. Number:	UN1008
Labels:	Poison Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (Chemically Pure)</b>	BTF-25-XX	> 99.5%	Total Impurities	< 0.5%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. BTF-25-200)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure PSIG	CGA Valve Connection
200	60	1800	330
35	10	1800	330
LB	0.375	1800	180

\*Nonstandard cylinder sizes available upon request

A colorless, flammable gas shipped as a liquid under its own vapor pressure.

## 1,3-Butadiene

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>6</sub>
Molecular Weight:	54.09
Specific Volume	6.9 ft <sup>3</sup> /lb (0.431 m <sup>3</sup> /kg)
CAS Registry Number:	106-99-0

Shipping Information:	
DOT Proper Name:	Butadienes, Inhibited
Hazard Class:	2.1
I.D. Number:	UN1010
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.0 (Chemically Pure)</b>	13B-20-XX	> 99.0% Liquid Phase	Total Impurities	< 1 %	3700 HP series LP gas regulator see page 4.60

XX - Complete the part number with the desired cylinder size listed below. (ie. 13B-20-33)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
454, 400	570	21	510
350, 400	135	21	510
33	7	21	510
LB	0.375	21	170

\*Nonstandard cylinder sizes available upon request

## n-Butane

A colorless, flammable gas shipped as a liquid under its own vapor pressure.

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>10</sub>
Molecular Weight:	58.12
Specific Volume	6.34 ft <sup>3</sup> /lb (0.396 m <sup>3</sup> /kg)
CAS Registry Number:	106-97-8

Shipping Information:	
DOT Proper Name:	Butane
Hazard Class:	2.1
I.D. Number:	UN1011
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 4.0 (Research)</b>	NBA-40-XX	> 99.99%	Total Impurities	< 100 ppm	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 2.5 (Instrument)</b>	NBA-25-XX	> 99.5%	Total Impurities	< 0.5%	
<b>PurityPlus 2.0 (Chemically Pure)</b>	NBA-20-XX	> 99.0%	Total Impurities	< 1%	

XX - Complete the part number with the desired cylinder size listed below. (ie. NBA-25-454)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure	CGA Valve Connection
454	540	16.3	510
350	120	16.3	510
200	40	16.3	510
80	6	16.3	510
LB	0.375	16.3	170

\*Nonstandard cylinder sizes available upon request

A colorless, flammable gas shipped as a liquid under its own vapor pressure.

## 1-Butene

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>8</sub>
Molecular Weight:	56.11
Specific Volume	6.55 ft <sup>3</sup> /lb (0.409 m <sup>3</sup> /kg)
CAS Registry Number:	106-98-9

Shipping Information:	
DOT Proper Name:	Liquid Petroleum Gas (Butene)
Hazard Class:	2.1
I.D. Number:	UN 1012
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 4.0 (Polymer Grade)</b>	1BE-40-XX	> 99.99 % Liquid Phase	Moisture Total Sulfur Total Impurities: 1,3 Butadiene, Methane, Ethane, trans-2-Butene, cis-2-Butene, Propane, Other C-4's, Moisture, Sulfur	< 5 ppm < 0.5 ppm < 100 ppm	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 3.0 (Research)</b>	1BE-30-XX	> 99.9 % Liquid Phase	Total Impurities	< 1000 ppm	
<b>PurityPlus 2.5 (Instrument)</b>	1BE-25-XX	> 99.5 % Gas Phase	Total Impurities	< 0.5 %	
<b>PurityPlus 2.0 (Chemically Pure)</b>	1BE-20-XX	> 99.0 % Liquid Phase	Total Impurities	< 1 %	

XX - Complete the part number with the desired cylinder size listed below. (ie. 1BE-20-454)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
454	540	23	510
350	128	23	510
80	17	23	510
LB	0.375	23	170

\*Nonstandard cylinder sizes available upon request

## CIS-2-Butene

A colorless, flammable, liquefied gas having a slight aromatic odor.

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>8</sub>
Molecular Weight:	56.11
Specific Volume	6.7 ft <sup>3</sup> /lb (0.42 m <sup>3</sup> /kg)
CAS Registry Number:	590-18-1

Shipping Information:	
DOT Proper Name:	Butylene
Hazard Class:	2.1
I.D. Number:	UN1012
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.0 (Chemically Pure)</b>	C2B-20-XX	> 99.0% Liquid Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 1% < 1 ppm < 5 ppm < 1%	202 series brass regulator Series 8500 stainless steel manual control valve
<b>PurityPlus 1.5 (Technical)</b>	C2B-15-XX	> 95.0% Liquid Phase	Total impurities	< 5%	

XX - Complete the part number with the desired cylinder size listed below. (ie. C2B-20-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure	CGA Valve Connection
½ Ton	570.0	13	510
LP30	136.0	13	510
LP15	81.0	13	510
LP05	27.0	13	510
LP01	6.0	13	510
350	135.0	13	510
300	55.0	13	510
200	50.0	13	510
80	18.0	13	510
30	8.0	13	510
LB	0.375	13	170

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable slightly acidic gas.

## Carbon Dioxide

Technical Information:	
Chemical Symbol:	CO <sub>2</sub>
Molecular Weight:	44.04
Specific Volume	8.76 ft <sup>3</sup> /lb (0.55 m <sup>3</sup> /kg)
CAS Registry Number:	124-38-9

Shipping Information:	
DOT Proper Name:	Carbon Dioxide
Hazard Class:	2.2
I.D. Number:	UN 1013
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	CDI-50-XX	99.999%	Oxygen Nitrogen Carbon Monoxide Methane Moisture Carbon Dioxide	< 1 ppm < 1 ppm < 0.1 ppm < 0.5 ppm < 2 ppm 99.999%	300 series brass regulator see page 4.12
<b>PurityPlus 4.8 (Scientific)</b>	CDI-48-XX	99.998%	Argon + Oxygen Moisture Carbon Monoxide THC (as methane) Carbon Dioxide	< 2 ppm < 3 ppm < 1 ppm < 2 ppm 99.998%	300 series brass regulator see page 4.12
<b>PurityPlus Laser 4.5</b>	CDI-45-XX	99.995%	Moisture Oxygen Total Hydrocarbons Carbon Dioxide	< 5 ppm < 5 ppm < 1 ppm 99.995%	400 series stainless steel regulator see page 4.18
<b>PurityPlus Coleman 4.0 (Instrument)</b>	CDI-40-XX	99.99%	Moisture Oxygen Nitrogen Carbon Dioxide	< 10 ppm < 20 ppm < 50 ppm 99.99%	300 series brass regulator see page 4.12
<b>PurityPlus Anaerobic 3.0</b>	CDI-30-XX	99.9%	Oxygen Carbon Dioxide	< 20 ppm 99.9%	200 series brass regulator see page 4.8
<b>PurityPlus 2.8 (Bone Dry)</b>	CDI-28-XX	99.8%	Moisture Carbon Dioxide	< 20 ppm 99.8%	200 series brass regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. CDI-45-200)

Standard Cylinder Sizes *	Contents lb	Cylinder Pressure PSIG	CGA Valve Connection
200	50	838	320
80	20	838	320

\*Nonstandard cylinder sizes available upon request

## Carbon Monoxide

A colorless, odorless, toxic, flammable gas.

Technical Information:	
Chemical Symbol:	CO
Molecular Weight:	28.01
Specific Volume	13.8 ft <sup>3</sup> /lb (0.86 m <sup>3</sup> /kg)
CAS Registry Number:	630-08-0

Shipping Information:	
DOT Proper Name:	Carbon Monoxide, Compressed
Hazard Class:	2.3
I.D. Number:	UN 1016
Labels:	Poison Gas, Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 4.0</b>	CMO-40-XX	99.99%	Nitrogen Oxygen Carbon Dioxide Hydrogen Total Hydrocarbons Moisture	< 10 ppm < 2 ppm < 20 ppm < 10 ppm < 5 ppm < 5 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 2.5 (Chemically Pure)</b>	CMO-25-XX	> 99.5%	Total Impurities	< 0.5%	300 series brass regulator see page 4.12
<b>PurityPlus 2.0 (Technical)</b>		99.0%	Total Impurities	< 1.0%	200 series brass regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. CMO-40-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	236	2000	350
200	175	1660	350
150A	148	2000	350
80A	78	2000	350
33A	34	2000	350

\*Nonstandard cylinder sizes available upon request

A colorless gas with an unpleasant smell.

## Carbonyl Sulfide

Technical Information:	
Chemical Symbol:	COS
Molecular Weight:	60.7
Specific Volume	2.1 ft <sup>3</sup> /lb
CAS Registry Number:	463-58-1

Shipping Information:	
DOT Proper Name:	Carbonyl Sulfide
Hazard Class:	2.3
I.D. Number:	UN 2204
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 3.0</b>	COS-30-XX	99.9%	Oxygen Nitrogen Moisture Carbon Dioxide Hydrogen Sulfide	< 0.01% < 0.03% < 0.01% < 0.03% < 0.01%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. COS-30-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	44	174.7	330
80	16	174.7	330
33	7	174.7	330

\*Nonstandard cylinder sizes available upon request



## Chlorine

A greenish-yellow, toxic, corrosive gas with an extremely disagreeable odor.

Technical Information:	
Chemical Symbol:	Cl <sub>2</sub>
Molecular Weight:	70.91
Specific Volume	5.4 ft <sup>3</sup> /lb (0.33 m <sup>3</sup> /kg)
CAS Registry Number:	7782-50-5

Shipping Information:	
DOT Proper Name:	Chlorine
Hazard Class:	2.3
I.D. Number:	UN 1017
Labels:	Poison Gas, Corrosive

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 3.0 (High Purity)</b>	CHL-30-XX	> 99.9%	Total Impurities	< 1000 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 2.5 (Chemically Pure)</b>	CHL-25-XX	> 99.5%	Total Impurities	< 0.5%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. CHL-30-400)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
400	150	85	660
200	100	85	660
80	40	85	660
30	15	85	660

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, flammable, stable isotope of hydrogen.

## Deuterium

Technical Information:	
Chemical Symbol:	D <sub>2</sub>
Molecular Weight:	4.03
Specific Volume	95.9 ft <sup>3</sup> /lb (5.95 m <sup>3</sup> /kg)
CAS Registry Number:	7782-39-0

Shipping Information:	
DOT Proper Name:	Deuterium
Hazard Class:	2.1
I.D. Number:	UN 1957
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	DEU-50-XX	99.999%	Hydrogen Oxygen Nitrogen Moisture Deuterium Hydride Total Hydrocarbons Carbon Monoxide Carbon Dioxide	< 100 ppm < 1 ppm < 1 ppm < 1 ppm < 3000 ppm < 1 ppm < 1 ppm < 1 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.0</b>	DEU-40-XX	> 99.99%	Total Impurities	< 100 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 2.7</b>	DEU-27-XX	> 99.7%	Total Impurities	< 0.3%	200 series regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. DEU-50-200)

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure	CGA Valve Connection
200	5000	1760	350
80	1000	890	350
30	500	1090	350

\*Nonstandard cylinder sizes available upon request

## Dimethyl Ether (DME)

A colorless, flammable gas shipped as a liquid under its own vapor pressure.

Technical Information:	
Chemical Symbol:	(CH <sub>3</sub> ) <sub>2</sub> O
Molecular Weight:	46.07
Specific Volume	8.4 ft <sup>3</sup> /lb (0.524 m <sup>3</sup> /kg)
CAS Registry Number:	115-10-6

Shipping Information:	
DOT Proper Name:	Dimethyl Ether
Hazard Class:	2.1
I.D. Number:	UN1033
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.8 (Chemically Pure)</b>	DME-28-XX	Min. 99.8 wt% Liquid Phase	Other Volatiles Sulfur Compounds Moisture Non-Volatile Residue	Max 0.2 wt% Max 500 ppmw Max 100 ppmw Max 50g/100 ml	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 2.5 (Technical)</b>	DME-25-XX	> 99.5% Liquid Phase	Total Impurities	< 0.5%	

XX - Complete the part number with the desired cylinder size listed below. (ie. DME-28-350)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
350	100	62.3	510
30	16	62.3	510
LB	0.5	62.3	170

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, flammable gas.

## Ethane

Technical Information:	
Chemical Symbol:	C <sub>2</sub> H <sub>6</sub>
Molecular Weight:	30.07
Specific Volume	12.80 ft <sup>3</sup> /lb (0.79 m <sup>3</sup> /kg)
CAS Registry Number:	74-84-0

Shipping Information:	
DOT Proper Name:	Ethane, Compressed
Hazard Class:	2.1
I.D. Number:	UN 1035
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (Instrument)</b>	ETA-25-XX	> 99.5%	Total Impurities	< 5000 ppm	200 series brass regulator see page 4.8
<b>PurityPlus 2.0 (Chemically Pure)</b>	ETA-20-XX	> 99.0%	Total Impurities	< 1.0%	

XX - Complete the part number with the desired cylinder size listed below. (ie. ETA-20-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	34	544	350
80	11	544	350
30	4	544	350

\*Nonstandard cylinder sizes available upon request

## Ethylene

A colorless, flammable gas with a sweet odor.

Technical Information:	
Chemical Symbol:	C <sub>2</sub> H <sub>4</sub>
Molecular Weight:	28.05
Specific Volume	13.70 ft <sup>3</sup> /lb (0.86 m <sup>3</sup> /kg)
CAS Registry Number:	74-85-1

Shipping Information:	
DOT Proper Name:	Ethylene, Compressed
Hazard Class:	2.1
I.D. Number:	UN 1962
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 4.0</b>	ETH-40-XX	99.99%	Ethane Total Impurities	< 100 ppm < 100 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 3.0 (Polymer Grade)</b>	ETH-30-XX	99.9%	Ethane Total Impurities	< 0.1% < 0.1%	200 series brass regulator see page 4.8
<b>PurityPlus 2.5 (Chemically Pure)</b>	ETH-25-XX	99.5%	Ethane Total Impurities	< 0.5% < 0.5%	200 series brass regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. ETH-40-300)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
300	37	1600	350
200	30	1200	350
80	10	1200	350

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, tasteless, inert gas.

## Helium

Technical Information:	
Chemical Symbol:	He
Molecular Weight:	4.003
Specific Volume	96.7 ft <sup>3</sup> /lb (6.0 m <sup>3</sup> /kg)
CAS Registry Number:	7440-59-7

Shipping Information:	
DOT Proper Name:	Helium, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1046
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 7.0</b>	HEL-70-XX	99.9999%	Oxygen Moisture Nitrogen Total Hydrocarbons Carbon Monoxide Carbon Dioxide Total Impurities	< 50 ppb < 50 ppb < 50 ppb < 20 ppb < 20 ppb < 20 ppb < 100 ppb	
<b>PurityPlus 6.0 (Research)</b>	HEL-60-XX	99.9999%	Oxygen Moisture Nitrogen Total Hydrocarbons Carbon Monoxide Carbon Dioxide Total of all impurities	< 0.2 ppm < 0.2 ppm < 0.4 ppm < 0.1 ppm < 0.1 ppm < 0.1 ppm < 1 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 5.5 (Chromatograph)</b>	HEL-55-XX	99.9995%	Oxygen Nitrogen Moisture Total Hydrocarbons	< 1 ppm < 3 ppm < 1 ppm < 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 5.0 (Ultra High Purity)</b>	HEL-50-XX	99.999%	Oxygen Moisture Total Hydrocarbons	< 1 ppm < 1 ppm < 0.5 ppm	
<b>PurityPlus Zero 4.8</b>	HEL-48-XX	99.998%	Total Hydrocarbons	< 0.5 ppm	
<b>PurityPlus 4.7 (Prepurified)</b>	HEL-47-XX	99.997%	Oxygen Moisture	< 5 ppm < 5 ppm	

XX - Complete the part number with the desired cylinder size listed below. (ie. HEL-60-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	291	2640	580
200	217	2200	580
80	73	2200	580

\*Nonstandard cylinder sizes available upon request

## Hexafluoroethane (R116)

A colorless, non-corrosive, non-flammable liquefied gas.

Technical Information:	
Chemical Symbol:	C <sub>2</sub> F <sub>6</sub>
Molecular Weight:	138.01
Specific Volume	2.8 ft <sup>3</sup> /lb
CAS Registry Number:	75-16-4

Shipping Information:	
DOT Proper Name:	Hexafluoroethane
Hazard Class:	2.2
I.D. Number:	UN 2193
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
PurityPlus 5.0	116-50-XX	99.999% Liquid Phase	Oxygen Nitrogen Moisture Carbon Monoxide Carbon Dioxide Other Organics Acidity Total Impurities	< 2 ppm < 8 ppm < 1.5 ppm < 0.5 ppm < 0.5 ppm < 0.5 ppm < 0.1 ppmw 10 ppm	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator

XX - Complete the part number with the desired cylinder size listed below. (ie. 116-50-200)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
200	95.0	23.5	660/320
80	43.0	23.5	660/320
30	15.0	23.5	660/320

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable gas.

## Hexafluoropropylene

Technical Information:	
Chemical Symbol:	C <sub>3</sub> F <sub>6</sub>
Molecular Weight:	150.03
Specific Volume	2.58 ft <sup>3</sup> /lb (0.161 m <sup>3</sup> /kg)
CAS Registry Number:	116-15-4

Shipping Information:	
DOT Proper Name:	Hexafluoropropylene, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1858
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
PurityPlus 3.0	HXP-30-XX	99.9%	Saturated Hydrocarbons Unsaturated Hydrocarbons Oxygen Acidity	< 0.2 ppm < 0.3 ppm < 50 ppm < 0.0001%	3700 HP series LP gas regulator see page 4.60

XX - Complete the part number with the desired cylinder size listed below. (ie. HXP-30-LP300)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
LP300	125	85	660
LP150	30	85	660
LP60	14	85	660

\*Nonstandard cylinder sizes available upon request



## Hydrogen

A colorless, odorless, flammable gas.

Technical Information:	
Chemical Symbol:	H <sub>2</sub>
Molecular Weight:	2.02
Specific Volume	192 ft <sup>3</sup> /lb (11.9 m <sup>3</sup> /kg)
CAS Registry Number:	1333-74-0

Shipping Information:	
DOT Proper Name:	Hydrogen, Compressed
Hazard Class:	2.1
I.D. Number:	UN 1049
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 6.0 (Research)</b>	HYD-60-XXX	99.9996%	Oxygen Moisture Nitrogen THC CO/CO <sub>2</sub>	< 0.2 ppm < 0.5 ppm < 0.3 ppm < 0.1 ppm < 0.1 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 5.5 (Chromatograph)</b>	HYD-55-XXX	99.9995%	Oxygen Moisture Nitrogen Methane Carbon Dioxide Carbon Monoxide	< 0.5 ppm < 2 ppm < 2 ppm < 0.2 ppm < 0.1 ppm < 0.2 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 5.0 (Ultra High Purity)</b>	HYD-50-XXX	99.999%	Oxygen Moisture Nitrogen Total Hydrocarbons	< 1 ppm < 2 ppm < 5 ppm < 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus Zero 4.5</b>	HYD-45-XXX	99.995%	Total Hydrocarbons	< 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.0 (Prepurified)</b>	HYD-40-XXX	99.99%	Moisture Oxygen	< 10 ppm < 20 ppm	300 series brass regulator see page 4.12

XXX - Complete the part number with the desired cylinder size listed below. (ie. HYD-50-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	261	2400	350
200	195	2000	350
80	71	2000	350

\*Nonstandard cylinder sizes available upon request

A colorless, corrosive, irritating, toxic gas shipped as a liquid under its own vapor pressure.

## Hydrogen Bromide

Technical Information:	
Chemical Symbol:	HBr
Molecular Weight:	80.91
Specific Volume	4.76 ft <sup>3</sup> /lb (0.297 m <sup>3</sup> /kg)
CAS Registry Number:	10035-10-6

Shipping Information:	
DOT Proper Name:	Hydrogen Bromide, Anhydrous
Hazard Class:	2.3
I.D. Number:	UN1048
Labels:	Inhalation Hazard, Corrosive

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.8 (Chemically Pure)</b>	HYB-28-XX	> 99.8% Liquid Phase	Total Impurities	< 2000 ppm	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. HYB-28-80)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
80	30	320	330
30	10	320	330
LB	1	320	180

\*Nonstandard cylinder sizes available upon request

## Hydrogen Chloride

A colorless, corrosive, irritating, toxic gas.

Technical Information:	
Chemical Symbol:	HCl
Molecular Weight:	36.46
Specific Volume	10.6 ft <sup>3</sup> /lb (0.68 m <sup>3</sup> /kg)
CAS Registry Number:	7647-01-0

Shipping Information:	
DOT Proper Name:	Hydrogen Chloride, Anhydrous
Hazard Class:	2.3
I.D. Number:	UN 1050
Labels:	Poison Gas, Corrosive

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	HCL-50-XX	99.999%	Total Impurities (Nitrogen, Oxygen, CO, CO <sub>2</sub> , Total Hydrocarbons)	< 10 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 4.5</b>	HCL-45-XX	99.995%	Total Impurities (Nitrogen, Oxygen, CO, CO <sub>2</sub> , Total Hydrocarbons)	< 50 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 4.0</b>	HCL-40-XX	> 99.99%	Total Impurities	< 100 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 2.0 (Technical)</b>	HCL-20-XX	> 99%	Total Impurities	< 100 ppm	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. HCL-50-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	60	613	330
80	20	613	330
30	8	613	330

\*Nonstandard cylinder sizes available upon request

A colorless, flammable, toxic gas with the odor of rotten eggs.

## Hydrogen Sulfide

Technical Information:	
Chemical Symbol:	H <sub>2</sub> S
Molecular Weight:	34.08
Specific Volume	11.2 ft <sup>3</sup> /lb (0.69 m <sup>3</sup> /kg)
CAS Registry Number:	7783-06-4

Shipping Information:	
DOT Proper Name:	Hydrogen Sulfide, Liquefied
Hazard Class:	2.3
I.D. Number:	UN 1053
Labels:	Poison Gas, Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (Chemically Pure)</b>	H2X-25-XX	> 99.5%	Total Impurities	< 0.5%	400 series stainless steel regulator see page 4.18  408 series aluminum regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. H2X-25-400)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
400	170	252	330
200	60	252	330
80	20	252	330

\*Nonstandard cylinder sizes available upon request

## Isobutane

A colorless, flammable gas.

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>10</sub>
Molecular Weight:	58.12
Specific Volume	6.5 ft <sup>3</sup> /lb (0.40 m <sup>3</sup> /kg)
CAS Registry Number:	75-28-5

Shipping Information:	
DOT Proper Name:	Isobutane
Hazard Class:	2.1
I.D. Number:	UN 1969
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 4.0 (Research)</b>	ISB-40-XX	> 99.99%	Total Impurities	< 100 ppm	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 2.5 (Instrument)</b>	ISB-25-XX	> 99.5%	Total Impurities	< 0.5%	
<b>PurityPlus 2.0 (Chemically Pure)</b>	ISB-20-XX	> 99%	Total Impurities	< 1.0%	
<b>PurityPlus R600a (Liquid Phase Withdrawal)</b>			UL Certified		

XX - Complete the part number with the desired cylinder size listed below. (ie. ISB-25-350)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
350	116	31	510
LP20	20	31	510

\*Nonstandard cylinder sizes available upon request

A colorless, flammable, liquefied gas, having a coal gas odor.

## Isobutylene

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>8</sub>
Molecular Weight:	56.11
Specific Volume	6.7 ft <sup>3</sup> /lb
CAS Registry Number:	115-11-7

Shipping Information:	
DOT Proper Name:	Isobutylene
Hazard Class:	2.1
I.D. Number:	UN 1055
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 3.0</b>	IBU-30-XX	99.9% Gas Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 0.1% < 1 ppm < 5 ppm < 0.1%	202 series brass regulator Series 8500 stainless steel manual control valve
<b>PurityPlus 2.5</b>	IBU-25-XX	99.5% Gas Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 0.5% < 1 ppm < 5 ppm < 0.5%	202 series brass regulator Series 8500 stainless steel manual control valve
<b>PurityPlus 2.0</b>	IBU-20-XX	99% Gas Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 1% < 1 ppm < 10 ppm < 0.5%	202 series brass regulator Series 8500 stainless steel manual control valve

XX - Complete the part number with the desired cylinder size listed below. (ie. IBU-20-200)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
½ Ton	530.0	24.3	510
LP30	125.0	24.3	510
LP15	75.0	24.3	510
LP05	25.0	24.3	510
LP01	6.0	24.3	510
300	56.0	24.3	510
200	50.0	24.3	510
80	18.0	24.3	510
30	8.0	24.3	510

\*Nonstandard cylinder sizes available upon request

## Isopentane

A colorless, flammable liquid having a mild gasoline odor.

Technical Information:	
Chemical Symbol:	C <sub>5</sub> H <sub>12</sub>
Molecular Weight:	72.15
Specific Volume	Not Applicable
CAS Registry Number:	78-78-4

Shipping Information:	
DOT Proper Name:	Pentanes
Hazard Class:	3
I.D. Number:	UN 1265
Labels:	Flammable Liquid

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5</b>	IPT-25-XX	99.5% Gas Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 0.5% < 1 ppm < 5 ppm < 0.5%	202 series brass regulator Series 8500 stainless steel manual control valve
<b>PurityPlus 2.0</b>	IPT-20-XX	99% Gas Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 1% < 1 ppm < 5 ppm < 1%	202 series brass regulator Series 8500 stainless steel manual control valve

XX - Complete the part number with the desired cylinder size listed below. (ie. IPT-20-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
½ Ton	570.0	11.57	510
LP30	136.0	11.57	510
LP15	80.0	11.57	510
LP05	27.0	11.57	510
LP01	7.0	11.57	510
300	60.0	11.57	510
200	50.0	11.57	510
80	19.0	11.57	510
30	8.0	11.57	510

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable, inert, rare gas.

## Krypton

Technical Information:	
Chemical Symbol:	Kr
Molecular Weight:	83.80
Specific Volume	4.6 ft <sup>3</sup> /lb (0.29 m <sup>3</sup> /kg)
CAS Registry Number:	7439-90-9

Shipping Information:	
DOT Proper Name:	Krypton, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1056
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	KRY-50-XX	99.999%	Nitrogen Oxygen Hydrogen CO/CO <sub>2</sub> Tetrafluoromethane Total Hydrocarbons Moisture Xenon Total Impurities	< 10 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.5</b>	KRY-45-XX	99.995%	Nitrogen Oxygen Hydrogen CO/CO <sub>2</sub> Tetrafluoromethane Total Hydrocarbons Moisture Xenon	< 10 ppm < 2 ppm < 1 ppm < 1 ppm < 1 ppm < 1 ppm < 1 ppm < 20 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 2.0</b>	KRY-20-XX	> 99%	Total Impurities	< 1.0%	300 series regulator see page 4.12

XX - Complete the part number with the desired cylinder size listed below. (ie. KRY-50-300)

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure PSIG	CGA Valve Connection
300	10,000	2100	580
200	5000	1400	580
80	2500	1700	580
LB	100	760	580/110

\*Nonstandard cylinder sizes available upon request



## Methane

A colorless, odorless, tasteless, flammable gas.

Technical Information:	
Chemical Symbol:	CH <sub>4</sub>
Molecular Weight:	16.04
Specific Volume	23.7 ft <sup>3</sup> /lb (1.47 m <sup>3</sup> /kg)
CAS Registry Number:	74-82-8

Shipping Information:	
DOT Proper Name:	Methane, Compressed
Hazard Class:	2.1
I.D. Number:	UN 1971
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	MET-50-XX	> 99.999%	Total Impurities	< 10 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.0 (Ultra High Purity)</b>	MET-40-XX	> 99.99%	Total Impurities	< 100 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 2.0 (Chemically Pure)</b>	MET-20-XX	> 99%	Total Impurities	< 1.0%	200 series regulator see page 4.8
<b>PurityPlus 1.3 (Commercial)</b>	MET-13-XX	> 93%	Total Impurities	< 7.0 %	200 series regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. MET-50-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	356	2400	350
200	260	2000	350
80	88	2000	350

\*Nonstandard cylinder sizes available upon request

A colorless, flammable, potentially harmful, liquefied gas.

## Methyl Chloride

Technical Information:	
Chemical Symbol:	CH <sub>3</sub> Cl
Molecular Weight:	50.49
Specific Volume	7.5 ft <sup>3</sup> /lb (0.47 m <sup>3</sup> /kg)
CAS Registry Number:	74-87-3

Shipping Information:	
DOT Proper Name:	Methyl Chloride
Hazard Class:	2.1
I.D. Number:	UN1063
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (Chemically Pure)</b>	MEC-25-XX	> 99.5% Liquid Phase	Total Impurities	< 0.5%	200 series brass regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. MEC-25-454)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
454	800	59	510
350	100	59	510
80	25	59	510
LB	0.5	59	180

\*Nonstandard cylinder sizes available upon request

## Methyl Fluoride

A colorless, flammable, liquefied gas.

Technical Information:	
Chemical Symbol:	CH <sub>3</sub> F
Molecular Weight:	34.03
Specific Volume	11.36 ft <sup>3</sup> /lb (0.709 m <sup>3</sup> /kg)
CAS Registry Number:	593-53-3

Shipping Information:	
DOT Proper Name:	Methyl Fluoride
Hazard Class:	2.1
I.D. Number:	UN2454
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.0 (Chemically Pure)</b>	MEF-20-XX	> 99.0%	Total Impurities	< 1%	300 series brass regulator see page 4.12

XX - Complete the part number with the desired cylinder size listed below. (ie. MEF-20-10)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
10	0.25	538	350

\*Nonstandard cylinder sizes available upon request

A colorless, flammable, potentially harmful, liquefied gas.

## Methyl Mercaptan

Technical Information:	
Chemical Symbol:	CH <sub>3</sub> SH
Molecular Weight:	48.1
Specific Volume	8.0 ft <sup>3</sup> /lb (0.499 m <sup>3</sup> /kg)
CAS Registry Number:	74-93-1

Shipping Information:	
DOT Proper Name:	Methyl Mercaptan
Hazard Class:	2.3
I.D. Number:	UN1064
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (Chemically Pure)</b>	MEM-25-XX	> 99.5%	Total Impurities	< 0.5%	Series 3920 stainless steel lecture bottle regulator see page 4.40

XX - Complete the part number with the desired cylinder size listed below. (ie. MEM-25-XX)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
LB	0.5	15	110

\*Nonstandard cylinder sizes available upon request

## Monomethylamine (MMA)

A colorless, toxic, flammable, alkaline, liquefied gas.

Technical Information:	
Chemical Symbol:	CH <sub>3</sub> NH <sub>2</sub>
Molecular Weight:	31.06
Specific Volume	12.1 ft <sup>3</sup> /lb (0.755 m <sup>3</sup> /kg)
CAS Registry Number:	74-89-5

Shipping Information:	
DOT Proper Name:	Methylamine, Anhydrous
Hazard Class:	2.1
I.D. Number:	UN1061
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (Chemically Pure)</b>	MMA-25-XX	> 99.5% Liquid Phase	Total Impurities	< 0.5%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. MMA-25-350)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
350	125	29	705
LB	0.375	29	180

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable, inert gas.

## Neon

Technical Information:	
Chemical Symbol:	Ne
Molecular Weight:	20.18
Specific Volume	19.2 ft <sup>3</sup> /lb (1.19 m <sup>3</sup> /kg)
CAS Registry Number:	7440-01-9

Shipping Information:	
DOT Proper Name:	Neon, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1065
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Ultra High Purity)</b>	NEO-50-XX	99.999%	Helium Nitrogen Oxygen Moisture Hydrogen Total Hydrocarbons	< 8 ppm < 4 ppm < 1 ppm < 1 ppm < 1 ppm < 0.5 ppm	300 series brass regulator see page 4.12

XX - Complete the part number with the desired cylinder size listed below. (ie. NEO-50-300)

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure PSIG	CGA Valve Connection
300	7500	2400	580
200	6000	2200	580
80	2000	1775	580
LB	100	770	580/110

\*Nonstandard cylinder sizes available upon request

## Neopentane (Dimethylpropane)

A colorless, flammable, liquefied gas.

Technical Information:	
Chemical Symbol:	C <sub>5</sub> H <sub>12</sub>
Molecular Weight:	72.15
Specific Volume	5.30 ft <sup>3</sup> /lb (0.330 m <sup>3</sup> /kg)
CAS Registry Number:	463-82-1

Shipping Information:	
DOT Proper Name:	2,2-Dimethylpropane
Hazard Class:	2.1
I.D. Number:	UN2044
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.0 (Chemically Pure)</b>	NPT-20-XX	> 99.0%	Total Impurities	< 1%	3700 HP series LP gas regulator see page 4.60

XX - Complete the part number with the desired cylinder size listed below. (ie. NPT-20-LPS)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
LPS	5	7 psig	510

\*Nonstandard cylinder sizes available upon request

A colorless, nonflammable, toxic, oxidizing gas with an irritating odor.

## Nitric Oxide

Technical Information:	
Chemical Symbol:	NO
Molecular Weight:	30.01
Specific Volume	12.9 ft <sup>3</sup> /lb (0.80 m <sup>3</sup> /kg)
CAS Registry Number:	10102-43-9

Shipping Information:	
DOT Proper Name:	Nitric Oxide, Compressed
Hazard Class:	2.3
I.D. Number:	UN 1660
Labels:	Poison Gas, Oxidizer, Corrosive

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
PurityPlus 3.0	NOX-30-XX	> 99.9%	Total Impurities	< 1000 ppm	400 series stainless steel regulator see page 4.18
PurityPlus 2.0 (Chemically Pure)	NOX-20-XX	> 99.0%	Total Impurities	< 1.0%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. NOX-30-200)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
200	53	500	660
80	19	500	660

\*Nonstandard cylinder sizes available upon request



## Nitrogen

A colorless, odorless, chemically inert gas.

Technical Information:	
Chemical Symbol:	N <sub>2</sub>
Molecular Weight:	28.01
Specific Volume	13.8 ft <sup>3</sup> /lb (0.86 m <sup>3</sup> /kg)
CAS Registry Number:	7727-37-9

Shipping Information:	
DOT Proper Name:	Nitrogen, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1066
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 6.0 (Research)</b>	NIT-60-XX	99.9999%	Oxygen Moisture Total Hydrocarbons Carbon Monoxide Carbon Dioxide	< 0.2 ppm < 0.2 ppm < 0.1 ppm < 0.1 ppm < 0.1 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 5.5 (Chromatograph)</b>	NIT-55-XX	99.9995%	Oxygen Moisture Total Hydrocarbons Carbon Monoxide Carbon Dioxide	< 1 ppm < 1 ppm < 0.1 ppm < 1 ppm < 1 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 5.0 (Ultra High Purity)</b>	NIT-50-XX	99.999%	Oxygen Moisture Total Hydrocarbons	< 1 ppm < 1 ppm < 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.8 (Prepurified)</b>	NIT-48-XX	99.998%	Oxygen Moisture	< 5 ppm < 5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus Zero 4.8</b>	NIT-48-XX	99.998%	Total Hydrocarbons	< 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus O<sub>2</sub> Free 4.8</b>	NIT-OF-XX	99.998%	Oxygen	< 0.5 ppm	300 series brass regulator see page 4.12

XXX - Complete the part number with the desired cylinder size listed below. (ie. NIT-60-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	304	2640	580
200	228	2200	580
80	76	2200	580

\*Nonstandard cylinder sizes available upon request

A brownish, toxic, corrosive, liquefied gas.

## Nitrogen Dioxide (Dinitrogen Tetroxide)

Technical Information:	
Chemical Symbol:	NO <sub>2</sub>
Molecular Weight:	46.01
Specific Volume	4.7 ft <sup>3</sup> /lb (0.29 m <sup>3</sup> /kg)
CAS Registry Number:	10102-44-0

Shipping Information:	
DOT Proper Name:	Nitrogen Dioxide, Liquefied
Hazard Class:	2.3
I.D. Number:	UN 1067
Labels:	Poison Gas, Oxidizer, Corrosive

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5 (liquid phase)</b>	NDI-25-XX	99.5%	Moisture Particle (Metal Residue)	< 0.15% < 10 mg/L	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. NDI-25-200)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
200	120	15	660
35	10	15	660

\*Nonstandard cylinder sizes available upon request

## Nitrogen Trifluoride

A toxic, colorless, odorless, nonflammable gas.

Technical Information:	
Chemical Symbol:	NF <sub>3</sub>
Molecular Weight:	71.00
Specific Volume	5.043 ft <sup>3</sup> /lb (0.337 m <sup>3</sup> /kg)
CAS Registry Number:	7783-54-2

Shipping Information:	
DOT Proper Name:	Nitrogen Trifluoride, Compressed
Hazard Class:	2.2
I.D. Number:	UN 2451
Labels:	Nonflammable Gas, Oxidizer

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
PurityPlus 4.0	NTF-40-XX	99.99%	Oxygen/Argon Nitrogen Tetrafluoromethane Carbon Dioxide Nitrous Oxide Sulfur Hexafluoride Moisture Hydrogen Fluoride Carbon Monoxide Methane	< 5 ppm < 5 ppm < 40 ppm < 3 ppm < 3 ppm < 5 ppm < 1 ppm < 1 ppm < 1 ppm < 1 ppm	300 series brass regulator see page 4.12

XX - Complete the part number with the desired cylinder size listed below. (ie. NTF-40-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	44	1450	330

\*Nonstandard cylinder sizes available upon request

A colorless, sweet-tasting, oxidizing gas.

## Nitrous Oxide

Technical Information:	
Chemical Symbol:	N <sub>2</sub> O
Molecular Weight:	44.01
Specific Volume	8.7 ft <sup>3</sup> /lb (0.54 m <sup>3</sup> /kg)
CAS Registry Number:	10024-97-2

Shipping Information:	
DOT Proper Name:	Nitrous Oxide, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1070
Labels:	Nonflammable Gas, Oxidizer

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus VLSI 5.0</b>	N2O-VL-XX	99.999%	Nitrogen Oxygen Carbon Dioxide Total Hydrocarbons Moisture Carbon Monoxide Ammonia Nitric Oxide Nitrogen Dioxide Halogens	< 5 ppm < 2 ppm < 2 ppm < 1 ppm < 3 ppm < 1 ppm < 5 ppm < 0.5 ppm < 0.5 ppm < 0.5 ppm	400 series stainless steel regulator see page 4.18
<b>PurityPlus 4.5</b>	N2O-45-XX	99.995%	Oxygen Moisture Nitrogen Total Hydrocarbons CO/CO <sub>2</sub>	< 5 ppm < 5 ppm < 20 ppm < 5 ppm < 5 ppm	300 series brass regulator see page 4.12  308 series heated regulator see page 4.36
<b>PurityPlus 3.0</b>	N2O-30-XX	99.9%	Nitrogen Oxygen Carbon Dioxide Total Hydrocarbons Moisture Carbon Monoxide	< 400 ppm < 100 ppm < 250 ppm < 30 ppm < 50 ppm < 50 ppm	200 series brass regulator see page 4.8  308 series heated regulator see page 4.36
<b>PurityPlus AA 2.6</b>	N2O-26-XX	99.6%	Moisture O <sub>2</sub> /N <sub>2</sub>	< 30 ppm < 2000 ppm	200 series brass regulator see page 4.8  308 series regulator see page 4.36

XX - Complete the part number with the desired cylinder size listed below. (ie. N2O-VL-200)

Standard Cylinder Sizes *	Contents lb	Cylinder Pressure PSIG	CGA Valve Connection
200	60	745	326

\*Nonstandard cylinder sizes available upon request

## Octafluorocyclobutane (R318)

A colorless, odorless, non-flammable liquefied gas.

Technical Information:	
Chemical Symbol:	C <sub>4</sub> F <sub>8</sub>
Molecular Weight:	200.03
Specific Volume	1.85 ft <sup>3</sup> /lb
CAS Registry Number:	115-25-3

Shipping Information:	
DOT Proper Name:	Octafluorocyclobutane
Hazard Class:	2.2
I.D. Number:	UN 1976
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	318-50-XX	99.999% Liquid Phase	Oxygen Nitrogen Moisture Other Fluorocarbons Acidity Total Impurities	< 1 ppmw < 3 ppmw < 1 ppmw < 4 ppmw < 0.1 ppmw 10 ppm	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator
<b>PurityPlus 3.8</b>	318-38-XX	99.98% Liquid Phase	Oxygen Nitrogen Moisture Tetrafluoromethane Acidity Total Impurities	< 20 ppmv < 80 ppmv < 10 ppmv < 50 ppmv < 0.1 ppmw 200 ppm	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator
<b>PurityPlus 3.0</b>	318-30-XX	99.9% Liquid Phase	Air (N <sub>2</sub> , O <sub>2</sub> , CO, CO <sub>2</sub> ) Moisture Other Organics Total Impurities	< 300 ppmv < 10 ppmv < 1000 ppmv < 1000 ppmv	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator

XX - Complete the part number with the desired cylinder size listed below. (ie. 318-50-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	100.0	23.5	660/DISS 716
80	35.0	23.5	660/DISS 716
30	15.0	23.5	660/DISS 716

\*Nonstandard cylinder sizes available upon request

A colorless, relatively non-reactive gas.

## Octafluoropropane (HC-218)

Technical Information:	
Chemical Symbol:	C <sub>3</sub> F <sub>8</sub>
Molecular Weight:	188.0
Specific Volume	2.02 ft <sup>3</sup> /lb (0.126 m <sup>3</sup> /kg)
CAS Registry Number:	76-19-7

Shipping Information:	
DOT Proper Name:	Octafluoropropane
Hazard Class:	2.2
I.D. Number:	UN 2424
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	OFP-50-XX	99.999%	Organic Impurities Moisture Carbon Monoxide Carbon Dioxide Nitrogen/Oxygen Acidity (as HF)	< 10 ppm	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 3.0</b>	OFP-30-XX	> 99.9%	Total Impurities	< 1000 ppm	3700 HP series LP gas regulator see page 4.60

XX - Complete the part number with the desired cylinder size listed below. (ie. OFP-50-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	95	25	660
80	20	25	660

\*Nonstandard cylinder sizes available upon request

## Oxygen

A colorless, odorless, tasteless, highly oxidizing gas.

Technical Information:	
Chemical Symbol:	O <sub>2</sub>
Molecular Weight:	32
Specific Volume	12.1 ft <sup>3</sup> /lb (0.76 m <sup>3</sup> /kg)
CAS Registry Number:	7782-44-7

Shipping Information:	
DOT Proper Name:	Oxygen, Compressed
Hazard Class:	2.2
I.D. Number:	UN 1072
Labels:	Nonflammable Gas, Oxidizer

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	OXY-50-300	99.999%	Moisture Nitrogen Total Hydrocarbons CO/CO <sub>2</sub> Argon	< 1 ppm < 5 ppm < 0.5 ppm < 1 ppm < 5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.3 (Ultra High Purity)</b>	OXY-43-300	99.993%	Moisture Nitrogen Total Hydrocarbons	< 3 ppm < 10 ppm < 0.5 ppm	300 series brass regulator see page 4.12
<b>PurityPlus Zero 2.8</b>	OXY-28-300	99.8%	Total Hydrocarbons	< 0.5 ppm	300 series regulator see page 4.12
<b>PurityPlus Extra Dry 2.6</b>	OXY-26-300	99.6%	Moisture	< 10 ppm	200 series regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. OXY-50-300)

Standard Cylinder Sizes *	Contents ft <sup>3</sup> /m <sup>3</sup>	Cylinder Pressure PSIG	CGA Valve Connection
300	337	2640	540
200	249	2200	540
80	83	2200	540

\*Nonstandard cylinder sizes available upon request

A colorless, flammable, liquefied, hydrocarbon gas.

## Propane

Technical Information:	
Chemical Symbol:	C <sub>3</sub> H <sub>8</sub>
Molecular Weight:	44.096
Specific Volume	8.8 ft <sup>3</sup> /lb
CAS Registry Number:	74-98-6

Shipping Information:	
DOT Proper Name:	Propane
Hazard Class:	2.1
I.D. Number:	UN1978
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	PPE-50-XX	> 99.999%	Total Impurities	< 10 ppm	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 4.0 (Ultra High Purity)</b>	PPE-40-XX	> 99.99%	Total Impurities	< 100 ppm	
<b>PurityPlus 2.5 (Instrument)</b>	PPE-25-XX	> 99.5%	Total Impurities	< 0.5%	
<b>PurityPlus 2.0 (Chemically Pure)</b>	PPE-20-XX	> 99.0%	Total Impurities	< 1.0%	
<b>PurityPlus R290 (Liquid Phase Withdrawal)</b>			UL Certified		

XX - Complete the part number with the desired cylinder size listed below. (ie. PPP-30-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
350	105	109	510
200	35	109	510
80	13	109	510
LB	0.3	109	170

\*Nonstandard cylinder sizes available upon request



## Propylene

A colorless, flammable, liquefied, hydrocarbon gas.

Technical Information:	
Chemical Symbol:	C <sub>3</sub> H <sub>6</sub>
Molecular Weight:	42.08
Specific Volume	8.88 ft <sup>3</sup> /lb (0.554 m <sup>3</sup> /kg)
CAS Registry Number:	115-07-1

Shipping Information:	
DOT Proper Name:	Propylene
Hazard Class:	2.1
I.D. Number:	UN1077
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Electronic)</b>	PPY-50-XX	> 99.999%	Total Impurities	< 10 ppm	3700 HP series LP gas regulator see page 4.60
<b>PurityPlus 4.5 (Research)</b>	PPY-45-XX	> 99.995%	Total Impurities	< 50 ppm	
<b>PurityPlus 4.0</b>	PPY-40-XX	> 99.99%	Total Impurities	< 100 ppm	
<b>PurityPlus 3.0</b>	PPY-30-XX	> 99.9%	Total Impurities	< 1000 ppm	
<b>PurityPlus 2.5 (Polymer)</b>	PPY-25-XX	> 99.5%	Total Impurities	< 0.5%	
<b>PurityPlus 2.0 (Chemically Pure)</b>	PPY-20-XX	> 99.0%	Total Impurities	< 1.0%	

XX - Complete the part number with the desired cylinder size listed below. (ie. PPY-25-350)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
350	105	137	510
200	35	137	510
80	13	137	510
LB	0.3	137	170

\*Nonstandard cylinder sizes available upon request

A colorless, irritating, nonflammable, toxic, liquefied gas.

## Sulfur Dioxide

Technical Information:	
Chemical Symbol:	SO <sub>2</sub>
Molecular Weight:	64.06
Specific Volume	5.99 ft <sup>3</sup> /lb (0.374 m <sup>3</sup> /kg)
CAS Registry Number:	7446-09-5

Shipping Information:	
DOT Proper Name:	Sulfur Dioxide, Liquefied
Hazard Class:	2.2
I.D. Number:	UN 1079
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 3.8 (Anhydrous)</b>	SDO-38-XX	> 99.98%	Moisture Residue Sulfuric Acid	< 20 ppm < 50 ppm < 20 ppm	Series 400 stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. SDO-38-761)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
761	2000	34	660
400	150	34	660
40	40	34	660
LB	1	34	180

\*Nonstandard cylinder sizes available upon request

## Sulfur Hexafluoride

A colorless, odorless, liquefied gas.

Technical Information:	
Chemical Symbol:	SF <sub>6</sub>
Molecular Weight:	146.05
Specific Volume	2.50 ft <sup>3</sup> /lb (0.16 m <sup>3</sup> /kg)
CAS Registry Number:	2551-62-4

Shipping Information:	
DOT Proper Name:	Sulfur Hexafluoride
Hazard Class:	2.2
I.D. Number:	UN 1080
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	SF6-50-XX	99.999%	Air Tetrafluoromethane Moisture	< 6 ppm < 2 ppm < 2 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 4.0</b>	SF6-40-XX	99.99%	Air Tetrafluoromethane Moisture Oil Acidity (as HF)	< 50 ppm < 40 ppm < 5 ppm < 2 ppm < 0.3 ppm	300 series brass regulator see page 4.12
<b>PurityPlus 3.0</b>	SF6-30-XX	99.9%	Air Tetrafluoromethane Moisture Oil Acidity (as HF)	< 300 ppm < 300 ppm < 8 ppm < 5 ppm < 0.3 ppm	200 series brass regulator see page 4.8

XX - Complete the part number with the desired cylinder size listed below. (ie. SF6-50-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	115	320	590
80	35	320	590
30	10	320	590

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable gas.

## Tetrafluoromethane (HC-14)

Technical Information:	
Chemical Symbol:	CF <sub>4</sub>
Molecular Weight:	88.005
Specific Volume	4.40 ft <sup>3</sup> /lb (0.027 m <sup>3</sup> /kg)
CAS Registry Number:	75-73-0

Shipping Information:	
DOT Proper Name:	Compressed Gas NOS Tetrafluoromethane
Hazard Class:	2.2
I.D. Number:	UN 1982
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	TFM-50-XX	99.999%	Oxygen/Argon Nitrogen CO/CO <sub>2</sub> Other Halocarbons Sulfur Hexafluoride Moisture Acidity (as HF)	< 1 ppm < 4 ppm < 1 ppm < 2 ppm < 1 ppm < 1 ppm < 0.1 ppmw	300 series brass regulator see page 4.12
<b>PurityPlus 4.0</b>	TFM-40-XX	99.99%	Oxygen/Argon Nitrogen CO/CO <sub>2</sub> Other Halocarbons Sulfur Hexafluoride Moisture Acidity (as HF)	< 5 ppm < 20 ppm < 10 ppm < 5 ppm < 5 ppm < 3 ppm < 0.01 ppmw	300 series brass regulator see page 4.12

XX - Complete the part number with the desired cylinder size listed below. (ie. TFM-50-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	70	2000	320
80	20	2000	320
LB	0.1	500	320/180

\*Nonstandard cylinder sizes available upon request

## Trans-2-Butene

A colorless, flammable, liquefied gas having a slight aromatic odor.

Technical Information:	
Chemical Symbol:	C <sub>4</sub> H <sub>8</sub>
Molecular Weight:	56.11
Specific Volume	7.6 ft <sup>3</sup> /lb
CAS Registry Number:	624-64-6

Shipping Information:	
DOT Proper Name:	Butylene
Hazard Class:	2.1
I.D. Number:	UN 1012
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
PurityPlus 2.0	T2B-20-XX	99% Liquid Phase	Other Hydrocarbons Sulfur Moisture Total impurities	< 1% < 1 ppm < 5 ppm < 1%	202 series brass regulator Series 8500 stainless steel manual control valve

XX - Complete the part number with the desired cylinder size listed below. (ie. T2B-20-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
½ Ton	540.0	15	510
LP30	128.0	15	510
LP15	77.0	15	510
LP05	25.0	15	510
LP01	6.0	15	510
300	55.0	15	510
200	50.0	15	510
80	18.0	15	510
30	8.0	15	510

\*Nonstandard cylinder sizes available upon request

A colorless, non-toxic, non-flammable gas with slightly ethereal odor

## Trifluoromethane (R23)

Technical Information:	
Chemical Symbol:	CHF <sub>3</sub>
Molecular Weight:	70.01
Specific Volume	5.5 ft <sup>3</sup> /lb
CAS Registry Number:	75-46-7

Shipping Information:	
DOT Proper Name:	Trifluoromethane
Hazard Class:	2.2
I.D. Number:	UN 1984
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0</b>	R23-50-XX	99.999% Liquid Phase	Air (N <sub>2</sub> , O <sub>2</sub> , CO, CO <sub>2</sub> ) Carbon Dioxide Moisture Other Organics Acidity Total Impurities	< 10 ppm < 10 ppm < 5 ppm < 10 ppm < 0.1 ppmw 10 ppm	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator
<b>PurityPlus 4.5</b>	R23-45-XX	99.995% Liquid Phase	Air (N <sub>2</sub> , O <sub>2</sub> , CO, CO <sub>2</sub> ) Carbon Dioxide Methane Moisture Other Organics Acidity Total Impurities	< 15 ppm < 2 ppm < 1 ppm < 4 ppm < 10 ppm < 0.1 ppmw 50 ppm	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator
<b>PurityPlus 3.0</b>	R23-30-XX	99.9% Liquid Phase	Air (N <sub>2</sub> , O <sub>2</sub> , CO, CO <sub>2</sub> ) Moisture Other Organics Acidity Total Impurities	< 500 ppm < 10 ppm < 1000 ppm < 0.1 ppmw < 1000 ppm	402 series stainless steel regulator 302 series brass regulator 202 series brass regulator

XX - Complete the part number with the desired cylinder size listed below. (ie. R23-50-200)

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection
200	70.0	23.5	660/DISS 716
80	25.0	23.5	660/DISS 716
30	11.0	23.5	660/DISS 716

\*Nonstandard cylinder sizes available upon request

## Trimethylamine (TMA)

A colorless, toxic, flammable gas.

Technical Information:	
Chemical Symbol:	(CH <sub>3</sub> ) <sub>3</sub> N
Molecular Weight:	59.11
Specific Volume	6.4 ft <sup>3</sup> /lb (0.4 m <sup>3</sup> /kg)
CAS Registry Number:	75-50-3

Shipping Information:	
DOT Proper Name:	Trimethylamine, Anhydrous
Hazard Class:	2.1
I.D. Number:	UN1083
Labels:	Flammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 2.5</b> (Chemically Pure)	TMA-25-XX	> 99.5%	Total Impurities	< 0.5%	400 series stainless steel regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. TMA-25-350)

Standard Cylinder Sizes *	Contents lbs.	Cylinder Pressure	CGA Valve Connection
350	125	13	510
LB	0.375	13	180

\*Nonstandard cylinder sizes available upon request

A colorless, odorless, nontoxic, inert gas.

## Xenon

Technical Information:	
Chemical Symbol:	Xe
Molecular Weight:	131.3
Specific Volume	2.90 ft <sup>3</sup> /lb (0.18 m <sup>3</sup> /kg)
CAS Registry Number:	7440-63-3

Shipping Information:	
DOT Proper Name:	Xenon
Hazard Class:	2.2
I.D. Number:	UN 2036
Labels:	Nonflammable Gas

Grade	Part No.	Purity	Impurity	Specification	Equipment Recommended
<b>PurityPlus 5.0 (Research)</b>	XEN-50-XX	99.999%	Krypton Moisture Hydrogen Oxygen Nitrogen Nitrous Oxide Total Hydrocarbons Tetrafluoromethane Carbon Dioxide Hexafluoroethane Total Impurities	< 10 ppm	400 series brass regulator see page 4.18

XX - Complete the part number with the desired cylinder size listed below. (ie. XEN-50-200)

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure PSIG	CGA Valve Connection
200	5000	900	580
80	2500	930	580
35	500	680	580

\*Nonstandard cylinder sizes available upon request







# MIXED GASES

 **PurityPlus**<sup>®</sup>  
SPECIALTY GASES

## Section 2 - Mixed Gases

Gas	Page Number
Introduction	2.1
Mixture Specifications	2.2
Ammonia	2.3
Argon	2.4 – 2.7
n-Butane	2.8 – 2.10
Carbon Dioxide	2.11 – 2.14
Carbon Monoxide	2.15 – 2.16
Ethane	2.17 – 2.18
Ethylene	2.19 – 2.20
Helium	2.21 – 2.22
Hexane	2.23
Hydrogen	2.24 – 2.27
Hydrogen Sulfide	2.28
Isobutane	2.29 – 2.30
Methane	2.31 – 2.34
Nitric Oxide	2.35
Nitrogen	2.36 – 2.38
Nitrogen Dioxide	2.39
Nitrous Oxide	2.40
Oxygen	2.41 – 2.42
n-Pentane	2.43
Propane	2.44 – 2.45
Propylene	2.46 – 2.47
Sulfur Dioxide	2.48 – 2.49
Sulfur Hexafluoride	2.50 – 2.51
Three Component Mixtures	2.52

## Mixed Gases

Our independently audited and certified laboratories use high accuracy scales combined with the state-of-the-art cylinder preparation techniques to ensure the most accurate and stable mixtures in the industry.

Our laboratories also employ the most sensitive instrumentation and certified reference gases to accurately analyze all of the raw materials used in the manufacture of our mixed gases. This allows for the correction of any cross contamination and ensures that our customers receive the most accurate mixtures possible. This is especially important in hydrocarbon mixtures where impurities can alter the final composition of a mixture.

We offer several grades of mixtures:

**PRIMARY STANDARD GRADE** - precisely blended mixtures using the most advanced gravimetric techniques, resulting in the highest accuracy of gas mixtures available. NIST traceable weights are used to calibrate the high precision scales.

**CERTIFIED STANDARD** - calibration gases prepared with high-accuracy gas blending systems, using gravimetric or partial pressure methods. They are then analyzed against Primary Reference Standards, the results of which are reported on the Certificate of Analysis (COA).

**CUSTOM MIXTURES** - process gas standards that are prepared in the same fashion, and to the same specifications as the Certified Standards, but the analysis is not reported. The requested composition is reported on the label.

**ENVIRONMENTAL MIXTURES** - high accuracy reference gas mixtures used for the calibration of emission monitoring equipment. These mixtures are manufactured to stringent EPA specifications and procedures to maximize stability and shelf life. NIST traceable Reference Materials are used to certify these mixtures.

Dynamic blending and batch analyses are also available for multiple cylinder batches. Please contact us for more details.

### AVAILABLE ANALYSES

**Component Analysis** - the determination of the concentration of each minor component in the requested mixture. - Results reported on the COA.

**Specific Impurity Analysis** - determination of the concentration of a specific impurity of concern. - Results reported on the COA.

We can prepare a wide variety and quantity of gases, such as 15 component hydrocarbon mixtures. There may be restrictions in the preparation of some mixtures. For example:

- Components that chemically react, even under limited conditions, will not be mixed together. Mixtures of fuels and oxidizers are given special consideration. Limits are determined by the fuel's lower explosive limit in an oxidizer, as well as the potential energy contained in the mixture.
- If a requested mixture contains a liquefied gas, such as propane, the final pressure of the mixture may be limited to prevent condensation of the component in the cylinder. Condensation of a component would result in separation of the component and the mixture would not be stable.

If there are any questions or concerns, our technical staff is available to assist you in selecting a mixture or series of mixtures to meet your needs. Please contact your nearest PurityPlus sales office with any issue that you may have.

### MIXTURE SPECIFICATIONS:

There are two considerations used to determine the mixture grade required, the Mixture Preparation Tolerance and the Analytical Certification Tolerance.

**Mixture Preparation Tolerance** is the variation of a component from the requested concentration. Tighter tolerance requirements such as in the Aerospace or Electronics industries require Primary Standard grade mixtures. Other requirements, such as process monitoring operations can use the Custom Grade gas mixtures, where only the requested concentration is reported on the label. Whatever your gas requirements may be, you can be assured that our technicians will use the proper care and techniques in the manufacture of your mixture.

Mixture Preparation Tolerance			
Requested concentration	Primary Standard	Certified Standard	Custom Mixture
0.1-50%	± 1% of requested concentration	± 2% of requested concentration	Custom Mixtures are manufactured to the same Mixture Preparation Tolerances as our Certified Standard. However, the analysis is not reported and the mixture is labeled with the requested value.
10-999 PPM	± 5% of requested concentration	± 10% of requested concentration	
1-10 PPM	± 10% or requested concentration	± 20% of requested concentration	

**Analytical Certification Tolerance**, is the term used to indicate the level of certainty of an analysis. Any analytical measurement has a small amount of acceptable variation in the results. The higher accuracy methods of analysis have less variation. The Primary Standard Grade has the highest accuracy and the certainty is within ± 200 PPM for components greater than 2.0%. Please contact us if you have any questions as to which is the right mixture for your requirement.

Analytical Certification Tolerance			
Requested concentration	Primary Standard	Certified Standard	Custom Mixture
0.1-50%	± 1% of reported concentration or 0.02% absolute, whichever is smaller	± 2% of reported concentration	Custom Mixtures are manufactured to the same Mixture Preparation Tolerances as our Certified Standard. However, the analysis is not reported and the mixture is labeled with the requested value.
10-999 PPM	± 1% of reported concentration	± 5% of reported concentration	
1-10 PPM	± 0.1 PPM of reported concentration	± 10% of reported concentration	

## Ammonia

Ammonia, in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	0.1-4%	200	214	2000	400 series stainless steel regulator see page 4.18	705
			150AL	144	2000		
Certified	CS-2-AIR-XX-DN	10-99ppm	150AL	144	2000	400 series stainless steel regulator see page 4.18	705
			35AL	29	2000		
		100-999ppm	150AL	144	2000		
			35AL	29	2000		
			0.1-4%	200	214		
		150AL	144	2000			
		35AL	29	2000			

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Ammonia, in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	0.1-4%	200	208	2000	400 series stainless steel regulator see page 4.18	705
			150AL	140	2000		
Certified	CS-2-NIT-XX-DN	10-99ppm	150AL	140	2000	400 series stainless steel regulator see page 4.18	705
			35AL	28	2000		
		100-999ppm	150AL	140	2000		
			35AL	28	2000		
			0.1-4%	200	208		
		150AL	140	2000			
		35AL	28	2000			

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Ammonia in other balance gases are available upon request.

## Argon

Argon, in Helium							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-HEL-XX-DN	100 ppm-50%	200	200	2000	300 series brass regulator see page 4.12	580
Certified	CS-2-HEL-XX-DN	1-49ppm	200	200	2000	300 series brass regulator see page 4.12	580
			80	73	2000		
		50-999 ppm	35	32	2000		
			200	200	2000		
		0.1-50%	80	73	2000		
			35	32	2000		
			200	200	2000		
			80	73	2000		
Custom	CM-2-HEL-XX-DN	50-999 ppm	200	200	2000	300 series brass regulator see page 4.12	580
			80	73	2000		
			35	32	2000		
		0.1-50%	200	200	2000		
			80	73	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed gas, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Argon in other balance gases are available upon request.

**Argon (cont.)**

Argon, in Hydrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-HYD-XX-DN	100 ppm-50%	200	197	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-HYD-XX-DN	1-49ppm	200	197	2000	300 series brass regulator see page 4.12	350
			80	72	2000		
		50-999 ppm	35	31	2000		
			200	197	2000		
		0.1-50%	80	72	2000		
			35	31	2000		
			200	197	2000		
			80	72	2000		
35	31	2000					
Custom	CM-2-HYD-XX-DN	50-999 ppm	200	197	2000	300 series brass regulator see page 4.12	350
			80	72	2000		
			35	31	2000		
		0.1-50%	200	197	2000		
			80	72	2000		
			35	31	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, Flammable N.O.S.
Hazard Class:	2.3
I.D. Number:	UN 1954
Labels:	Flammable Gas

Argon in other balance gases are available upon request.



## Argon (cont.)

Argon, in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	100 ppm-50%	200	208	2000	300 series brass regulator see page 4.12	580
Certified	CS-2-NIT-XX-DN	1-49ppm	200	208	2000	300 series brass regulator see page 4.12	580
			80	76	2000		
		50-999 ppm	35	32	2000		
			200	108	2000		
		0.1-50%	80	76	2000		
			35	32	2000		
			200	208	2000		
			80	76	2000		
35	32	2000					
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	580
			80	76	2000		
			35	32	2000		
		0.1-50%	200	208	2000		
			80	76	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed gas, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Argon in other balance gases are available upon request.

**Argon (cont.)**

<b>Argon, in Oxygen</b>							
<b>Grade</b>	<b>Part No.</b>	<b>Concentration</b>	<b>Cylinder Size</b>	<b>Contents cu.ft.</b>	<b>Pressure psig @ 70° F</b>	<b>Equipment Recommended</b>	<b>CGA Valve Connection</b>
<b>Primary</b>	PS-2-OXY-XX-DN	100 ppm-50%	200	226	2000	300 series brass regulator see page 4.12	296
<b>Certified</b>	CS-2-OXY-XX-DN	1-49ppm	200	226	2000	300 series brass regulator see page 4.12	296
			80	83	2000		
		50-999 ppm	35	35	2000		
			200	226	2000		
		0.1-50%	80	83	2000		
			35	35	2000		
			200	226	2000		
			80	83	2000		
35	35	2000					
<b>Custom</b>	CM-2-OXY-XX-DN	50-999 ppm	200	226	2000	300 series brass regulator see page 4.12	296
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
			35	35	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

<b>Shipping Information:</b>	
DOT/TC Proper Name:	Compressed Gas Oxidizing N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 3156
Labels:	Non-flammable Gas and Oxidizer

Argon in other balance gases are available upon request.

## n-Butane

n-Butane in Air								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-AIR-XX-DN	50ppm-0.9%	200	214	2000	300 series brass regulator see page 4.12	590	
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	590	
			35AL	29	2000			
			1-49 ppm	200	214			2000
				80	78			2000
		50-999 ppm	35	33	2000			
			200	214	2000			
			80	78	2000			
			35	33	2000			
		0.1-0.9%	200	214	2000			
			80	78	2000			
35	33		2000					
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590	
			80	78	2000			
			35	33	2000			
		0.1-0.9%	200	214	2000			
			80	78	2000			
			35	33	2000			

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

n-Butane in other balance gases are available upon request.

**n-Butane (cont.)**

n-Butane in Helium							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-HEL-XX-DN	50ppm-0.9%	200	200	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-HEL-XX-DN	100-999 ppb	150AL	135	2000	300 series brass regulator see page 4.12	350
			35AL	27	2000		
			200	200	2000		
		1-49 ppm	200	200	2000		
			80	73	2000		
			35	32	2000		
		50-999 ppm	200	200	2000		
			80	73	2000		
			35	32	2000		
		0.1-0.9%	200	200	2000		
			80	73	2000		
			35	32	2000		
Custom	CM-2-HEL-XX-DN	50-999 ppm	200	200	2000	300 series brass regulator see page 4.12	350
			80	73	2000		
			35	32	2000		
		0.1-0.9%	200	200	2000		
			80	73	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

n-Butane in other balance gases are available upon request.

## n-Butane (cont.)

n-Butane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	50ppm-0.9%	200	208	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	140	2000	300 series brass regulator see page 4.12	350
			35AL	28	2000		
			200	208	2000		
		1-49 ppm	200	208	2000		
			80	76	2000		
			35	32	2000		
		50-999 ppm	200	208	2000		
			80	76	2000		
			35	32	2000		
		0.1-0.9%	200	208	2000		
80	76		2000				
35	32		2000				
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			80	76	2000		
			35	32	2000		
		0.1-0.9%	200	208	2000		
			80	76	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

n-Butane in other balance gases are available upon request.

**Carbon Dioxide**

Carbon Dioxide in Air								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-AIR-XX-DN	50ppm-30%	200	214	2000	300 series brass regulator see page 4.12	590	
Certified	CS-2-AIR-XX-DN	1-99 ppm	200	214	2000	300 series brass regulator see page 4.12	590	
			150AL	144	2000			
			80	78	2000			
			35	33	2000			
			35AL	29	2000			
			200	214	2000			
		100-999 ppm	200	214	2000			
			80	78	2000			
			35	33	2000			
			0.1-30%	200	214			2000
				80	78			2000
				35	33			2000
Custom	CM-2-AIR-XX-DN	100-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590	
			80	78	2000			
			35	33	2000			
		0.1-30%	200	214	2000			
			80	78	2000			
			35	33	2000			

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Carbon Dioxide in other balance gases are available upon request.

## Carbon Dioxide (cont.)

Carbon Dioxide in Helium								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-HEL-XX-DN	50ppm-30%	200	200	2000	300 series brass regulator see page 4.12	580	
Certified	CS-2-HEL-XX-DN	1-99 ppm	200	200	2000	300 series brass regulator see page 4.12	580	
			150AL	135	2000			
			80	73	2000			
			35	32	2000			
			35AL	27	2000			
			200	200	2000			
		100-999 ppm	200	200	2000			
			80	73	2000			
			35	32	2000			
			0.1-30%	200	200			2000
				80	73			2000
				35	32			2000
Custom	CM-2-HEL-XX-DN	100-999 ppm	200	200	2000	300 series brass regulator see page 4.12	580	
			80	73	2000			
			35	32	2000			
		0.1-30%	200	200	2000			
			80	73	2000			
			35	32	2000			

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Carbon Dioxide in other balance gases are available upon request.

**Carbon Dioxide (cont.)**

Carbon Dioxide in Nitrogen								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-NIT-XX-DN	50ppm-30%	200	208	2000	300 series brass regulator see page 4.12	580	
Certified	CS-2-NIT-XX-DN	1-99 ppm	200	208	2000	300 series brass regulator see page 4.12	580	
			150AL	140	2000			
			80	76	2000			
			35	32	2000			
			35AL	28	2000			
			200	208	2000			
		100-999 ppm	200	208	2000			
			80	76	2000			
			35	32	2000			
			0.1-30%	200	208			2000
				80	76			2000
				35	32			2000
Custom	CM-2-NIT-XX-DN	100-999 ppm	200	208	2000	300 series brass regulator see page 4.12	580	
			80	76	2000			
			35	32	2000			
		0.1-30%	200	208	2000			
			80	76	2000			
			35	32	2000			

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Carbon Dioxide in other balance gases are available upon request.



## Carbon Dioxide (cont.)

Carbon Dioxide in Oxygen								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-OXY-XX-DN	50ppm-30%	200	226	2000	300 series brass regulator see page 4.12	296	
Certified	CS-2-OXY-XX-DN	1-99 ppm	200	226	2000	300 series brass regulator see page 4.12	296	
			150AL	152	2000			
			80	83	2000			
			35	35	2000			
			35AL	30	2000			
			200	226	2000			
		100-999 ppm	200	226	2000			
			80	83	2000			
			35	35	2000			
			0.1-30%	200	226			2000
				80	83			2000
				35	35			2000
Custom	CM-2-OXY-XX-DN	100-999 ppm	200	226	2000	300 series brass regulator see page 4.12	296	
			80	83	2000			
			35	35	2000			
		0.1-30%	200	226	2000			
			80	83	2000			
			35	35	2000			

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed gas, oxidizing, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 3156
Labels:	Non-flammable Gas / Oxidizer

Carbon Dioxide in other balance gases are available upon request.

**Carbon Monoxide**

Carbon Monoxide in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	1-9 ppm	150AL	144	2000	300 series brass regulator see page 4.12	590
		10-999ppm	150AL	144	2000		
		0.1-4%	200	177	1650		
Certified	CS-2-AIR-XX-DN	0.5-9.9 ppm	150AL	144	2000	300 series brass regulator see page 4.12	590
			35AL	29	2000		
		10-999ppm	150AL	144	2000		
			35AL	29	2000		
		0.1-4%	200	177	1650		
			80	64	1650		
Custom	CM-2-AIR-XX-DN	0.1-4%	200	177	1650	300 series brass regulator see page 4.12	590
			80	64	1650		
			35	28	1650		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
% of Carbon Monoxide:	< 20.0%
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Carbon Monoxide in other balance gases are available upon request.

## Carbon Monoxide (cont.)

Carbon Monoxide in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	1-9 ppm	150AL	140	2000	300 series brass regulator see page 4.12	350
		10-999ppm	150AL	140	2000		
		0.1-4%	200	173	1650		
Certified	CS-2-NIT-XX-DN	0.5-9.9 ppm	150AL	140	2000	300 series brass regulator see page 4.12	350
			35AL	28	2000		
		10-999ppm	150AL	140	2000		
			35AL	28	2000		
		0.1-9.9%	200	173	1650		
			80	64	1650		
			35	28	1650		
		10-50%	200	173	1650		
			80	64	1650		
	35	28	1650				
Custom	CM-2-NIT-XX-DN	0.1-9.9%	200	173	1650	300 series brass regulator see page 4.12	350
			80	64	1650		
			35	28	1650		
		10-50%	200	173	1650		
			80	64	1650		
			35	28	1650		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
% of Carbon Monoxide:	> 20.0%
DOT/TC Proper Name:	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.1
I.D. Number:	UN 1954
Labels:	Flammable Gas

Carbon Monoxide in other balance gases are available upon request.

**Ethane**

Ethane in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	50ppm-1.5%	200	214	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	350
			35AL	29	2000		
			200	214	2000		
		1-49 ppm	80	78	2000		
			35	33	2000		
			200	214	2000		
		50-999 ppm	80	78	2000		
			35	33	2000		
			200	214	2000		
		0.1-1.5%	80	78	2000		
35	33		2000				
200	214		2000				
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	350
			80	78	2000		
			35	33	2000		
		0.1-1.5%	200	214	2000		
			80	78	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:		
% of Ethane:	< 12.0%	> 12.0%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Ethane in other balance gases are available upon request.

## Ethane (cont.)

Ethane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	50ppm-1.5%	200	208	2000	300 series brass regulator see page 4.12	590
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	140	2000	300 series brass regulator see page 4.12	590
			35AL	28	2000		
			200	208	2000		
		1-49 ppm	200	208	2000		
			80	76	2000		
			35	32	2000		
		50-999 ppm	200	208	2000		
			80	76	2000		
			35	32	2000		
		0.1-20%	200	208	2000		
80	76		2000				
35	32		2000				
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	590
			80	76	2000		
			35	32	2000		
		0.1-20%	200	208	2000		
			80	76	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:		
% of Ethane:	< 12.0%	> 12.0%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Ethane in other balance gases are available upon request.

**Ethylene**

Ethylene in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	10-49 ppm	200	214	2000	300 series brass regulator see page 4.12	590
		50 ppm-1.55%	200	214	2000		
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	590
			35AL	29	2000		
			200	214	2000		
		1-49ppm	200	214	2000		
			80	78	2000		
			35	33	2000		
		50-999 ppm	200	214	2000		
			80	78	2000		
			35	33	2000		
		0.1-1.55%	200	214	2000		
			80	78	2000		
			35	33	2000		
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		0.1-1.55%	200	214	2000		
			80	78	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:		
% of Ethylene:	< 6.0%	> 6.0%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Ethylene in other balance gases are available upon request.

## Ethylene (cont.)

Ethylene in Nitrogen								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-NIT-XX-DN	10-49 ppm	200	214	2000	300 series brass regulator see page 4.12	350	
		50 ppm-50%	200	214	2000			
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	350	
			35AL	29	2000			
			1-49ppm	200	214			2000
				80	78			2000
		50-999 ppm	35	33	2000			
			200	214	2000			
			80	78	2000			
			35	33	2000			
		0.1-50%	200	214	2000			
			80	78	2000			
			35	33	2000			
			200	214	2000			
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	350	
			80	78	2000			
			35	33	2000			
		0.1-50%	200	214	2000			
			80	78	2000			
			35	33	2000			

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:		
% of Ethylene:	< 6.0%	> 6.0%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Ethylene in other balance gases are available upon request.

**Helium**

Helium in Argon							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-ARG-XX-DN	500 ppm -50%	200	226	2000	300 series brass regulator see page 4.12	580
Certified	CS-2-ARG-XX-DN	1-49 ppm	200	226	2000	300 series brass regulator see page 4.12	580
			80	83	2000		
			35	35	2000		
		50-999 ppm	200	226	2000		
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
			35	35	2000		
Custom	CM-2-ARG-XX-DN	50-999 ppm	200	226	2000	300 series brass regulator see page 4.12	580
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
			35	35	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:	
Major Component:	Argon
DOT/TC Proper Name:	Compressed gas, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Helium in other balance gases are available upon request.



## Helium (cont.)

Helium in Nitrogen								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-NIT-XX-DN	500 ppm -50%	200	208	2000	300 series brass regulator see page 4.12	580	
Certified	CS-2-NIT-XX-DN	1-49 ppm	200	208	2000	300 series brass regulator see page 4.12	580	
			80	76	2000			
			35	32	2000			
		50-999 ppm	200	208	2000			
			80	76	2000			
			35	32	2000			
		0.1-50%	200	208	2000			
			80	76	2000			
Custom	CM-2-NIT-XX-DN		50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	580
				80	76	2000		
		35		32	2000			
0.1-50%			200	208	2000			
			80	76	2000			
						200	208	2000
						80	76	2000
35	32	2000						

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
Major Component:	Nitrogen
DOT/TC Proper Name:	Compressed gas, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Helium in other balance gases are available upon request.

**Hexane**

Hexane in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	10-49 ppm	200	214	2000	300 series brass regulator see page 4.12	590
		50-700 ppm	200	214	2000		
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	590
			35AL	29	2000		
		1-99 ppm	200	214	2000		
			35	33	2000		
		100-700 ppm	200	214	2000		
			35	33	2000		
Custom	CM-2-AIR-XX-DN	100-700 ppm	200	214	2000	300 series brass regulator see page 4.12	590
					35		

Hexane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	10-49 ppm	200	208	2000	300 series brass regulator see page 4.12	350
		50-700 ppm	200	208	2000		
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	140	2000	300 series brass regulator see page 4.12	350
			35AL	28	2000		
		1-99 ppm	200	208	2000		
			35	32	2000		
		100-700 ppm	200	208	2000		
			35	32	2000		
Custom	CM-2-NIT-XX-DN	100-700 ppm	200	208	2000	300 series brass regulator see page 4.12	350
					35		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Hexane in other balance gases are available upon request.

## Hydrogen

Hydrogen in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	10 ppm-0.1% 0.1-2.0%	150AL	144	2000	300 series brass regulator see page 4.12	590
			200	214	2000		
Certified	CS-2-AIR-XX-DN	5-49 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		50-999ppm	200	214	2000		
			80	78	2000		
			35	33	2000		
		0.1-2.0%	200	214	2000		
			80	78	2000		
35	33		2000				
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		0.1-2.0%	200	214	2000		
			80	78	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:	
Major Component:	Air
% of Hydrogen:	< 2.8%
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Hydrogen in other balance gases are available upon request.

**Hydrogen (cont.)**

Hydrogen in Argon							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-ARG-XX-DN	0.1-50%	150AL	226	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-ARG-XX-DN	5-49 ppm	200	226	2000	300 series brass regulator see page 4.12	350
			80	83	2000		
			35	35	2000		
		50-999ppm	200	226	2000		
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
35	35		2000				
Custom	CM-2-ARG-XX-DN	50-999 ppm	200	226	2000	300 series brass regulator see page 4.12	350
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Argon	Argon
% of Hydrogen:	< 2.9%	> 2.9%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Hydrogen in other balance gases are available upon request.

## Hydrogen (cont.)

Hydrogen in Helium								
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection	
Primary	PS-2-HEL-XX-DN	0.1-50%	200	200	2000	300 series brass regulator see page 4.12	350	
Certified	CS-2-HEL-XX-DN	5-49 ppm	200	200	2000	300 series brass regulator see page 4.12	350	
			150AL	135	2000			
			80	73	2000			
			35	32	2000			
			35AL	27	2000			
			200	200	2000			
		50-999ppm	200	200	2000			
			80	73	2000			
			35	32	2000			
			0.1-50%	200	200			2000
				80	73			2000
				35	32			2000
Custom	CM-2-HEL-XX-DN	50-999 ppm	200	200	2000	300 series brass regulator see page 4.12	350	
			80	73	2000			
			35	32	2000			
		0.1-50%	200	200	2000			
			80	73	2000			
			35	32	2000			

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Helium	Helium
% of Hydrogen:	< 3.9%	> 3.9%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Hydrogen in other balance gases are available upon request.

**Hydrogen (cont.)**

Hydrogen in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	10 ppm-0.1%	150AL	208	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-NIT-XX-DN	5-49 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			80	76	2000		
			35	32	2000		
		50-999ppm	200	208	2000		
			80	76	2000		
			35	32	2000		
		0.1-2.0%	200	208	2000		
			80	76	2000		
			35	32	2000		
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			80	76	2000		
			35	32	2000		
		0.1-50%	200	208	2000		
			80	76	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Nitrogen	Nitrogen
% of Hydrogen:	< 5.7%	> 5.7%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Hydrogen in other balance gases are available upon request.

## Hydrogen Sulfide

Hydrogen Sulfide in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2- NIT-XX-DN	10 ppm -0.5%	150AL	140	2000	400 series stainless steel regulator see page 4.18	330
Certified	CS-2-NIT-XX-DN	0.5-9.9 ppm	150AL	140	2000	400 series stainless steel regulator see page 4.18	330
		10-50 ppm	150AL	140	2000		
		51-99 ppm	150AL	140	2000		
		100 ppm-0.49%	35AL	28	2000		
			150AL	140	2000		
			35AL	28	2000		
		0.5%-1%	200	208	2000		
			150AL	140	2000		
			35AL	28	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Hydrogen Sulfide in other balance gases are available upon request.

Shipping Information:			
Major Component:	Nitrogen	Nitrogen	Nitrogen
% of Hydrogen Sulfide:	< 4.3	>4.3% <14.24%	> 14.24%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.	Compressed Gas, Toxic, Flammable, N.O.S.
Hazard Class:	2.2	2.1	2.3
I.D. Number:	UN 1956	UN 1954	UN 1953
Labels:	Non-flammable Gas	Flammable Gas	Poison Gas, Inhalation Hazard and Flammable Gas

**Isobutane**

Isobutane in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	10-49 ppm	200	214	2000	300 series brass regulator see page 4.12	590
		50ppm -0.9%	200	214	2000		
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	590
			35AL	29	2000		
		1-49 ppm	200	214	2000		
			35	33	2000		
		50-999 ppm	200	214	2000		
			35	33	2000		
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			35	33	2000		
		0.1-0.9%	200	214	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Isobutane in other balance gases are available upon request.



## Isobutane (cont.)

Isobutane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	10-49 ppm	200	208	2000	300 series brass regulator see page 4.12	350
		50ppm -1.0%	200	208	2000		
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	140	2000	300 series brass regulator see page 4.12	350
			35AL	28	2000		
		1-49 ppm	200	208	2000		
			35	32	2000		
		50-999 ppm	200	208	2000		
			35	32	2000		
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			35	32	2000		
		0.1-1.0%	200	208	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Isobutane in other balance gases are available upon request.

**Methane**

<b>Methane in Air</b>							
<b>Grade</b>	<b>Part No.</b>	<b>Concentration</b>	<b>Cylinder Size</b>	<b>Contents cu.ft.</b>	<b>Pressure psig @ 70° F</b>	<b>Equipment Recommended</b>	<b>CGA Valve Connection</b>
<b>Primary</b>	PS-2-AIR-XX-DN	10ppm-2.5%	200	214	2000	300 series brass regulator see page 4.12	590
<b>Certified</b>	CS-2-AIR-XX-DN	1-49 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		50-999 ppm	200	214	2000		
			80	78	2000		
			35	33	2000		
		0.1-2.5%	200	214	2000		
			80	78	2000		
			35	33	2000		
<b>Custom</b>	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		0.1-2.5%	200	214	2000		
			80	78	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

<b>Shipping Information:</b>	
Major Component:	Air
% of Methane:	< 2.5%
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Methane in other balance gases are available upon request.

## Methane (cont.)

Methane in Argon							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-ARG-XX-DN	1-49 ppm	200	226	2000	300 series brass regulator see page 4.12	350
		50 ppm-50%	200	226	2000		
Certified	CS-2-ARG-XX-DN	1-49 ppm	200	226	2000	300 series brass regulator see page 4.12	350
			80	83	2000		
			35	35	2000		
		50-999 ppm	200	226	2000		
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
35	35		2000				
Custom	CM-2-ARG-XX-DN	50-999 ppm	200	226	2000	300 series brass regulator see page 4.12	350
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
			35	35	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Argon	Argon
% of Methane:	<10.0%	>10.0%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Methane in other balance gases are available upon request.

**Methane (cont.)**

<b>Methane in Hydrogen</b>							
<b>Grade</b>	<b>Part No.</b>	<b>Concentration</b>	<b>Cylinder Size</b>	<b>Contents cu.ft.</b>	<b>Pressure psig @ 70° F</b>	<b>Equipment Recommended</b>	<b>CGA Valve Connection</b>
<b>Primary</b>	PS-2-HYD-XX-DN	10-49 ppm	200	197	2000	300 series brass regulator see page 4.12	350
		50 ppm-50%	200	197	2000		
<b>Certified</b>	CS-2-HYD-XX-DN	1-49 ppm	200	197	2000	300 series brass regulator see page 4.12	350
			80	72	2000		
			35	31	2000		
		50-999 ppm	200	197	2000		
			80	72	2000		
			35	31	2000		
		0.1-50%	200	197	2000		
			80	72	2000		
35	31		2000				
<b>Custom</b>	CM-2-HYD-XX-DN	50-999 ppm	200	197	2000	300 series brass regulator see page 4.12	350
			80	72	2000		
			35	31	2000		
		0.1-50%	200	197	2000		
			80	72	2000		
			35	31	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

<b>Shipping Information:</b>	
Major Component:	Hydrogen
DOT/TC Proper Name:	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.1
I.D. Number:	UN 2034
Labels:	Flammable Gas

Methane in other balance gases are available upon request.

## Methane (cont.)

Methane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	1-9 ppm	200	208	2000	300 series brass regulator see page 4.12	350
		10 ppm-50%	200	208	2000		
Certified	CS-2-NIT-XX-DN	1-49 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			80	76	2000		
			35	32	2000		
		50-999 ppm	200	208	2000		
			80	76	2000		
			35	32	2000		
		0.1-50%	200	208	2000		
			80	76	2000		
35	32		2000				
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			80	76	2000		
			35	32	2000		
		0.1-50%	200	208	2000		
			80	76	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Nitrogen	Nitrogen
% of Methane:	< 14.3%	> 14.3%
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas

Methane in other balance gases are available upon request.

**Nitric Oxide**

Nitric Oxide in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	2.9-9 ppm	150AL	140	2000	400 series stainless steel regulator see page 4.18	660
		10-999 ppm	150AL	140	2000		
		0.1-0.5%	150AL	140	2000		
Certified	CS-2-NIT-XX-DN	0.4-9.9 ppm	150AL	140	2000	400 series stainless steel regulator see page 4.18	660
			35AL	28	2000		
		10-99 ppm	150AL	140	2000		
			35AL	28	2000		
		100-999 ppm	150AL	140	2000		
			35AL	28	2000		
		0.1-0.99%	150AL	140	2000		
			35AL	28	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
% of Nitric Oxide:	< 2.3%
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Nitric Oxide in other balance gases are available upon request.

## Nitrogen

Nitrogen in Argon							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-ARG-XX-DN	200ppm - 50%	200	226	2000	300 series brass regulator see page 4.12	580
Certified	CS-2-ARG-XX-DN	1- 49 ppm	200	226	2000	300 series brass regulator see page 4.12	580
			80	83	2000		
			35	35	2000		
		50-999 ppm	200	226	2000		
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		
35	35		2000				
Custom	CM-2-ARG-XX-DN	50-999ppm	200	226	2000	300 series brass regulator see page 4.12	580
			80	83	2000		
			35	35	2000		
		0.1-50%	200	226	2000		
			80	83	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
Major Component:	Argon
DOT/TC Proper Name:	Compressed gas, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Nitrogen in other balance gases are available upon request.

**Nitrogen (cont.)**

Nitrogen in Helium							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-HEL-XX-DN	200ppm - 50%	200	200	2000	300 series brass regulator see page 4.12	580
Certified	CS-2-HEL-XX-DN	1- 49 ppm	200	200	2000	300 series brass regulator see page 4.12	580
			80	73	2000		
			35	32	2000		
		50-999 ppm	200	200	2000		
			80	73	2000		
			35	32	2000		
		0.1-50%	200	200	2000		
			80	73	2000		
			35	32	2000		
Custom	CM-2-HEL-XX-DN	50-999ppm	200	200	2000	300 series brass regulator see page 4.12	580
			80	73	2000		
			35	32	2000		
		0.1-50%	200	200	2000		
			80	73	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
Major Component:	Helium
DOT/TC Proper Name:	Compressed gas, n.o.s.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Nitrogen in other balance gases are available upon request.



## Nitrogen (cont.)

Nitrogen in Hydrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-HYD-XX-DN	200ppm - 50%	200	197	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-HYD-XX-DN	1- 49 ppm	200	197	2000	300 series brass regulator see page 4.12	350
			80	72	2000		
			35	31	2000		
		50-999 ppm	200	197	2000		
			80	72	2000		
			35	31	2000		
		0.1-50%	200	197	2000		
			80	72	2000		
			35	31	2000		
Custom	CM-2-HYD-XX-DN	50-999ppm	200	197	2000	300 series brass regulator see page 4.12	350
			80	72	2000		
			35	31	2000		
		0.1-50%	200	197	2000		
			80	72	2000		
			80	31	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:	
Major Component:	Hydrogen
DOT/TC Proper Name:	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.1
I.D. Number:	UN 1954
Labels:	Flammable Gas

Nitrogen in other balance gases are available upon request.

**Nitrogen Dioxide**

Nitrogen Dioxide in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	500 ppm - 1.0%	150AL	144	2000	400 series stainless steel regulator see page 4.18	660
Certified	CS-2-AIR-XX-DN	1-19.9 ppm	150AL	144	2000	400 series stainless steel regulator see page 4.18	660
			35AL	29	2000		
		20-999 ppm	150AL	144	2000		
			35AL	29	2000		
		0.1-1%	200	214	2000		
			150AL	144	2000		
			35AL	29	2000		

Nitrogen Dioxide in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	500 ppm - 2.2%	150AL	140	2000	400 series stainless steel regulator see page 4.18	660
Certified	CS-2-NIT-XX-DN	1-19.9 ppm	150AL	140	2000	400 series stainless steel regulator see page 4.18	660
			35AL	28	2000		
		20-999 ppm	150AL	140	2000		
			35AL	28	2000		
		0.1-2.2%	200	208	2000		
			150AL	140	2000		
			35AL	28	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:	
% of Nitrogen Dioxide:	< 2.2%
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Nitrogen Dioxide in other balance gases are available upon request.

## Nitrous Oxide

Nitrous Oxide in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	50 ppm -50%	200	208	2000	300 series brass regulator see page 4.12	590
Certified	CS-2-NIT-XX-DN	1-99 ppm	200	208	2000	300 series brass regulator see page 4.12	590
			150AL	140	2000		
			80	76	2000		
			35	32	2000		
		100-9999 ppm	35AL	28	2000		
			200	208	2000		
			150AL	140	2000		
			80	76	2000		
		1-50%	35	32	2000		
			35AL	28	2000		
			200	208	2000		
			80	76	2000		
Custom	CM-2-NIT-XX-DN	100-9999 ppm	200	208	2000	300 series brass regulator see page 4.12	590
			150AL	140	2000		
			80	76	2000		
			35	32	2000		
			35AL	28	2000		
			200	208	2000		
1-50%	80	76	2000				
	35	32	2000				

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Nitrous Oxide in other balance gases are available upon request.

**Oxygen**

Oxygen in Argon							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-ARG-XX-DN	100-999 ppm	150AL	152	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
		0.1-50%	200	226	2000		
Certified	CS-2-ARG-XX-DN	1-49 ppm	150AL	152	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
		50-999 ppm	35AL	30	2000		
			150AL	152	2000		
		0.1-50%	35AL	30	2000		
			200	226	2000		
			80	83	2000		
Custom	CM-2-ARG-XX-DN	0.1-50%	200	226	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
			80	83	2000		
			35	35	2000		

Oxygen in Helium							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-HEL-XX-DN	100-999 ppm	150AL	135	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
		0.1-50%	200	200	2000		
Certified	CS-2-HEL-XX-DN	1-49 ppm	150AL	135	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
		50-999 ppm	35AL	27	2000		
			150AL	135	2000		
		0.1-50%	35AL	27	2000		
			200	200	2000		
			80	73	2000		
Custom	CM-2-HEL-XX-DN	0.1-50%	200	200	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
			80	73	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Argon or Helium	(Argon, Helium, Nitrogen) Note:
DOT/TC Proper Name:	Compressed gas, n.o.s.	> 23.5% O2 Compressed Gas, Oxidizing N.O.S.
Hazard Class:	2.2	2.2
I.D. Number:	UN 1956	UN 3156
Labels:	Non-flammable Gas	Non-flammable Gas and Oxidizers

Oxygen in other balance gases are available upon request.

## Oxygen (cont.)

Oxygen in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	100-999 ppm	150AL	140	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
		0.1-50%	200	208	2000		
Certified	CS-2-NIT-XX-DN	1-49 ppm	150AL	140	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
		50-999 ppm	35AL	28	2000		
			150AL	140	2000		
		0.1-50%	35AL	32	2000		
			200	208	2000		
			80	76	2000		
Custom	CM-2-NIT-XX-DN	0.1-50%	200	208	2000	300 series brass regulator see page 4.12	Varies with Oxygen concentration
			80	76	2000		
			35	28	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:		
Major Component:	Nitrogen	(Argon, Helium, Nitrogen) Note:
DOT/TC Proper Name:	Compressed Gas, N.O.S.	> 23.5% O2 Compressed Gas, Oxidizing N.O.S.
Hazard Class:	2.2	2.2
I.D. Number:	UN 1956	UN 3156
Labels:	Non-flammable Gas	Non-flammable Gas and Oxidizers

Oxygen in other balance gases are available upon request.

**n-Pentane**

n-Pentane in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	1 ppm -0.7%	200	214	2000	300 series brass regulator see page 4.12	590
Certified	CS-2-AIR-XX-DN	1 ppm-0.7%	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		

n-Pentane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	1 ppm -1.0%	200	208	2000	300 series brass regulator see page 4.12	350
Certified	CS-2-NIT-XX-DN	1 ppm-1.0%	200	208	2000	300 series brass regulator see page 4.12	350
			80	76	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

n-Pentane in other balance gases are available upon request.

## Propane

Propane in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	1-9.9 ppm	200	214	2000	300 series brass regulator see page 4.12	590
		10 ppm -1.05%	200	214	2000		
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	590
			35AL	29	2000		
		1-49 ppm	200	214	2000		
			35	33	2000		
		50-999 ppm	200	214	2000		
			35	33	2000		
0.1-1.05%	200	214	2000				
	35	33	2000				
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			35	33	2000		
		0.1-1.05%	200	214	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Propane in other balance gases are available upon request.

**Propane (cont.)**

Propane in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	1-9.9 ppm	200	208	2000	300 series brass regulator see page 4.12	350
		10 ppm -4%	200	208	2000		
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	140	2000	300 series brass regulator see page 4.12	350
			35AL	28	2000		
		1-49 ppm	200	208	2000		
			35	32	2000		
		50-999 ppm	200	208	2000		
			35	32	2000		
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			35	32	2000		
		0.1-4%	200	208	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Propane in other balance gases are available upon request.



## Propylene

Propylene in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	1-9.9 ppm	200	214	2000	300 series brass regulator see page 4.12	590
		10-49 ppm	200	214	2000		
		50 ppm-1.2%	200	214	2000		
Certified	CS-2-AIR-XX-DN	100-999 ppb	150AL	144	2000	300 series brass regulator see page 4.12	590
			35AL	29	2000		
		1-49 ppm	200	214	2000		
			35	33	2000		
		50-999 ppm	200	214	2000		
			35	33	2000		
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			35	33	2000		
		0.1-1.2%	200	214	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:		
% of Propylene:	< 5.6%*	> 5.6%*
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas
*According to CGA-PQ3		

Propylene in other balance gases are available upon request.

**Propylene (cont.)**

Propylene in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-NIT-XX-DN	1-9.9 ppm	200	208	2000	300 series brass regulator see page 4.12	350
		10-49 ppm	200	208	2000		
		50 ppm-6%	200	208	2000		
Certified	CS-2-NIT-XX-DN	100-999 ppb	150AL	140	2000	300 series brass regulator see page 4.12	350
			35AL	28	2000		
		1-49 ppm	200	208	2000		
			35	32	2000		
		50-999 ppm	200	208	2000		
			35	32	2000		
		0.1-6%	200	208	2000		
	35	32	2000				
Custom	CM-2-NIT-XX-DN	50-999 ppm	200	208	2000	300 series brass regulator see page 4.12	350
			35	32	2000		
		0.1-6%	200	208	2000		
			35	32	2000		

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:		
% of Propylene:	< 5.6%*	> 5.6%*
DOT/TC Proper Name:	Compressed Gas, N.O.S.	Compressed Gas, Flammable, N.O.S.
Hazard Class:	2.2	2.1
I.D. Number:	UN 1956	UN 1954
Labels:	Non-flammable Gas	Flammable Gas
*According to CGA-PQ3		

Propylene in other balance gases are available upon request.

## Sulfur Dioxide

Sulfur Dioxide in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	100 ppm-1%	150AL	144	2000	400 series stainless steel regulator see page 4.18	660
Certified	CS-2-AIR-XX-DN	0.4-9.9 ppm	150AL	144	2000	400 series stainless steel regulator see page 4.18	660
		10-99 ppm	150AL	144	2000		
			35AL	29	2000		
		100-999 ppm	150AL	144	2000		
			35AL	29	2000		
		0.1-1%	200	214	2000		
			150AL	144	2000		
			35AL	29	2000		

XX - Complete the part number with the desired cylinder size listed above.  
 DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Sulfur Dioxide in other balance gases are available upon request.

**Sulfur Dioxide (cont.)**

Sulfur Dioxide in Nitrogen							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-NIT-XX-DN	100 ppm-1%	150AL	140	2000	400 series stainless steel regulator see page 4.18	660
Certified	CS-2-NIT-XX-DN	0.4-9.9 ppm	150AL	140	2000	400 series stainless steel regulator see page 4.18	660
			35AL	28	2000		
		10-99 ppm	150AL	140	2000		
			35AL	28	2000		
		100-999 ppm	150AL	140	2000		
			35AL	28	2000		
			200	208	2000		
0.1-1%	150AL	140	2000				
	35AL	28	2000				

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Sulfur Dioxide in other balance gases are available upon request.

## Sulfur Hexafluoride

Sulfur Hexafluoride in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	50 ppm -0.9%	200	214	2000	300 series brass regulator see page 4.12	590
		1%-4.9%	200	214	2000		
		5-10%	200	214	2000		
Certified	CS-2-AIR-XX-DN	1-49 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		50-999 ppm	200	214	2000		
			80	78	2000		
			35	33	2000		
		0.1-0.9%	200	214	2000		
			80	78	2000		
			35	33	2000		
		1.0-4.9%	200	214	2000		
			80	78	2000		
			35	33	2000		
		5-10%	200	214	2000		
			80	78	2000		
			35	33	2000		
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	214	2000	300 series brass regulator see page 4.12	590
			80	78	2000		
			35	33	2000		
		0.1-0.9%	200	214	2000		
			80	78	2000		
			35	33	2000		
		1.0-4.9%	200	214	2000		
			80	78	2000		
			35	33	2000		
		5-10%	200	214	2000		
			80	78	2000		
			35	33	2000		

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Sulfur Hexafluoride in other balance gases are available upon request.

**Sulfur Hexafluoride (cont.)**

Sulfur Hexafluoride in Air							
Grade	Part No.	Concentration	Cylinder Size	Contents cu.ft.	Pressure psig @ 70° F	Equipment Recommended	CGA Valve Connection
Primary	PS-2-AIR-XX-DN	50 ppm -0.9%	200	208		300 series brass regulator see page 4.12	590
		1%-4.9%	200	208			
		5-10%	200	208			
Certified	CS-2-AIR-XX-DN	1-49 ppm	200	208		300 series brass regulator see page 4.12	590
			80	76			
			35	32			
		50-999 ppm	200	208			
			80	76			
			35	32			
		0.1-0.9%	200	208			
			80	76			
			35	32			
		1.0-4.9%	200	208			
			80	76			
			35	32			
5-10%	200	208					
	80	76					
	35	32					
Custom	CM-2-AIR-XX-DN	50-999 ppm	200	208		300 series brass regulator see page 4.12	590
			80	76			
			35	32			
		0.1-0.9%	200	208			
			80	76			
			35	32			
		1.0-4.9%	200	208			
			80	76			
			35	32			
		5-10%	200	208			
			80	76			
			35	32			

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas, N.O.S.
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Non-flammable Gas

Sulfur Hexafluoride in other balance gases are available upon request.

## Three Component Mixtures

Primary Standard, Certified Standard, and Custom Mixture grades are available in a wide variety of gas combinations from two components to fifteen components or more. Listed below are common minor components in a variety of balance gases. For additional components, or for components not listed in the tables, contact the nearest sales office.

The cylinder pressure, cylinder contents, CGA connections, and recommended equipment will vary according to the gases and gas concentrations in the final mixture. Please contact the nearest sales office for the specific details of your mixture.

Minor Components			
Argon	Ethane	Isobutane	Oxygen
Butane	Ethylene	Methane	Propane
Carbon Dioxide	Helium	Nitrogen	Propylene
Carbon Monoxide	Hydrogen	Nitrous Oxide	

Balance Gases	
Air	Nitrogen
Argon	Oxygen
Hydrogen	

Recommended Equipment
Series 300 regulators**
see page 4.12

Standard Cylinder Sizes *	Contents**	CGA Valve Connection**
300		
200		
80		

\*Nonstandard cylinder sizes available upon request

\*\*The cylinder pressure, cylinder contents, CGA connections, and recommended equipment will vary according to the gases and gas concentrations in the final mixture. Please contact the nearest sales office for the specific details of your mixture.









# SPECIAL APPLICATION MIXES

 **PurityPlus**<sup>®</sup>  
SPECIALTY GASES

## Section 3 - Special Application Mixtures

Gas	Page Number
Beverage and Food Gases	3.1 – 3.2
Biological Atmosphere Gas Mixtures	3.3
Electron Capture Mixtures	3.4
Nuclear Counter Mixtures	3.4
EPA Protocol Mixtures	3.5
Portable Calibration Standards	3.6 – 3.8
Flame Ionization Fuel Mixtures	3.9
Leak Detection Mixtures	3.9
Laser Mixtures	3.10
TCD Carrier Gas Mixture	3.11
Spark Chamber Mixtures	3.11
Hydrocarbon Mixtures	3.12 - 3.13
Semiconductor Gases	3.14
Medical Gases	3.15– 3.18

## Beverage and Food Gases

3

### Carbonation

Many of the most popular beverages are soft drinks supplied with carbonation. To maintain the intricate taste of the drinks, high quality carbon dioxide is required. When carbon dioxide is dissolved into a water based liquid, it reacts with the water to form carbonic acid. This carbonic acid exists in equilibrium with the carbon dioxide and participates in the flavor of the product. The carbon dioxide must be of the highest quality to prevent undesirable flavors from being introduced into the product. PurityPlus use only the highest quality products and the most advanced manufacturing techniques to ensure product consistency.

Sparkling beverages where carbon dioxide is a by-product of the fermentation process can also be enhanced with beverage gases. Additional carbon dioxide can be added to these beverages. Pure carbon dioxide is used for wine, but a mixture of carbon dioxide and nitrogen can be used with beer to improve pressurization and dispensing. These mixtures are also used to control the "head" on the beer. The higher the nitrogen content, the flatter the product will be in the glass.



### Food Freezing and Chilling

To improve flavor and shelf life, many of today's food products are frozen very quickly. Liquid carbon dioxide and liquid nitrogen can be used to increase the speed at which food products are frozen. Faster freezing reduces the product's core temperature thereby maintaining flavor, increasing shelf life, and reducing processing time, and increasing food safety. This is also true for products that are quick chilled, without actually freezing of the product.

### Fish Hatcheries

Dissolved oxygen is important for the survival of hatchery raised fish and crustaceans. High concentration of animals along with naturally occurring algae can act to reduce the oxygen needed for survival. Adding oxygen to the water can increase the survivability of the animals. This is also true when transporting live animals.



### Modified Atmosphere Packaging

Aerobic bacteria, molds, and oxygen can cause undesirable changes in foods. Food can become at best, unpalatable, or at worst, unsafe for consumption due to these processes. Use of Modified Atmosphere Packaging (MAP), with specially designed packaging, can extend the shelf life of some food products by slowing or preventing or slowing the reaction with oxygen, or preventing or slowing the growth of micro organisms.

The gases used in this process are primarily oxygen, nitrogen, and carbon dioxide. In special instances, carbon monoxide and the noble gases are also used.

**Oxygen** can be both detrimental as well as beneficial to packaged food items. Oxygen can cause oxidation of fats and pigments. Oxygen also supports the growth of aerobic micro organisms which are the primary cause of spoilage. On the other hand too little oxygen will cause deleterious changes in the coloration of meats. In addition, too little oxygen can also allow for the growth of anaerobic bacteria which can cause food poisoning. For these reasons, the oxygen concentration must be carefully controlled.

## Beverage and Food Gases

3

**Nitrogen** is a non-reactive gas that does not support the growth of aerobic micro organisms and thus can inhibit the growth of spoilage bacteria. Nitrogen, however, does not effect the growth of anaerobic micro organisms. Since nitrogen does not react or dissolve into food products, it is also used to prevent package collapse caused by the absorption of other MAP gases.

**Carbon dioxide** is an acid gas. It readily dissolves into water and produces carbonic acid, thereby decreasing the pH of a solution. Carbon dioxide is also soluble in organic compounds and fats. Carbon dioxide does inhibit the growth of some pathogenic bacteria and is an important addition to many MAP gas mixtures. Unfortunately, too much carbon dioxide can lead to package collapse due to the absorption of carbon dioxide by the food product or permeation through the packaging. If package collapse is not desirable, nitrogen can be added to the MAP mixture to prevent or minimize collapse.

**Carbon monoxide** is a very flammable, reactive, and toxic gas. However, small amounts of carbon monoxide will enhance desirable pigmentation of red meat. Carbon monoxide is also used to prevent browning of packaged lettuce. Care must be taken when dealing with this flammable and toxic gas.

Other gases that can be added to MAP gas mixtures are the noble gases. These gases are truly non-reactive gases. They include **helium, argon, krypton, and xenon**. These gases have similar actions as nitrogen. Argon is used to extend the shelf life of several fruits and berries.

Depending on volume requirements, MAP gases are supplied premixed in size 300 cylinders. For larger volumes, micro and mini-bulk installations are available. Please contact our technical staff for additional information and consultation regarding your specific requirements.



## Biological Atmosphere Gas Mixtures

3

These mixtures are used as control atmospheres for the growth of aerobic and anaerobic biological cultures. Anaerobic cultures thrive when deprived of oxygen. These gas mixtures contain less than 10 PPM of oxygen. Aerobic cultures require oxygen to survive. COA not included.

Anaerobic Mixtures	Part No.	Cylinder Size	Contents	Connection
0-5% Hydrogen	BIO-2-CDI-XX-DN	300	100 cf	350
Balance Carbon Dioxide		200	81 cf	350
5-10% Carbon Dioxide	BIO-3-NIT-XX-DN	300	276 cf	350
5-10% Hydrogen Balance Nitrogen		200	207 cf	350
0.5% Carbon Dioxide	BIO-2-NIT-XX-DN	300	301 cf	580
Balance Nitrogen		200	226 cf	580

Aerobic Mixtures				
5-10% Carbon Dioxide	BIO-2-OXY-XX-DN	300	293 cf	296
Balance Oxygen		200	220 cf	296
0.5-10% Carbon Dioxide	BIO-2-AIR-XX-DN	300	285 cf	590
Balance Air		200	214 cf	590

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulators  
see page 4.12

## Electron Capture Mixtures

3

Specially manufactured for use with Gas Chromatographs that utilize Electron Capture Detectors. Please refer to the Pure Gas section for helium and nitrogen carrier gases.

<b>P-5 Mixture</b>	<b>Part No.</b>	<b>Cylinder Size</b>	<b>Pressure</b>	<b>Contents</b>	<b>Connection</b>
5% Methane	ECD-2-ARG-XX-DN	300	2400 PSIG	315 cf	350
95% Argon		200	2000 PSIG	232 cf	350
<b>P-10 Mixture</b>					
10% Methane	ECD-2-ARG-XX-DN	300	2400 PSIG	315 cf	350
90% Argon		200	2000 PSIG	232 cf	350

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulators, see page 4.12

## Nuclear Counter Mixtures

For measuring radioactivity and ionization.

<b>Ultra P-5</b>	<b>Part No.</b>	<b>Cylinder Size</b>	<b>Pressure</b>	<b>Contents</b>	<b>Connection</b>
5% Methane UHP	NCM-2-ARG-XX-DN	300	2400 PSIG	315 cf	350
95% Argon UHP		200	2000 PSIG	232 cf	350
<b>Ultra P-10</b>					
10% Methane UHP	NCM-2-ARG-XX-DN	300	2400 PSIG	315 cf	350
90% Argon UHP		200	2000PSIG	232 cf	350
<b>Quench Gas</b>					
1.3% n-Butane	NCM-2-HEL-XX-DN	300	1050 PSIG	121 cf	350
98.7% Helium		200	1050 PSIG	107 cf	350

<b>Geiger Flow Gases</b>	<b>Part No.</b>	<b>Cylinder Size</b>	<b>Pressure</b>	<b>Contents</b>	<b>Connection</b>
0.95% Isobutane	NCM-2-HEL-XX-DN	300	2400 PSIG	262 cf	350
99.05% Helium		200	2000 PSIG	197 cf	350
1.5% Propane	NCM-2-HEL-XX-DN	300	2400 PSIG	262 cf	350
98.5% Helium		200	2000 PSIG	197 cf	350

### Recommended Equipment

300 series brass regulators, see page 4.12

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

## EPA Protocol Mixtures

EPA Protocol Mixtures are manufactured to stringent EPA specifications and procedures, utilizing the most advanced cylinder preparation procedures. These mixtures are then analyzed with NIST traceable standards. Aluminum cylinders are recommended for maximum shelf life.

EPA Protocol Mixtures - Two Component Mixtures					
Minor Component/Balance Gas	Part No.	Connection	Minor Component/Balance Gas	Part No.	Connection
<b>CO2 in Air</b> 1-20% CO2/Air 300-9999 PPM CO2/Air 100-299 PPM CO2/Air	EPA-2-AIR-XX-DN	590	<b>NO in N2</b> 0.5-1% NO/N2 100-4999 PPM NO/N2 30-99 PPM NO/N2	EPA-2-NIT-XX-DN	660
<b>CO2 in N2</b> 1-20% CO2/N2 300-2999 PPM CO2/N2 100-299 PPM CO2/N2	EPA-2-NIT-XX-DN	580	10-29.9 PPM NO/N2 5-9.9 PPM NO/N2 1-3.9 PPM NO/N2		
<b>CO in Air</b> 1-3% CO/Air 100-9999 PPM CO/Air 10-99 PPM CO/Air 8-9.9 PPM CO/Air	EPA-2-AIR-XX-DN	590	<b>NOx in Air</b> 500-5000 NOx/Air 100-499 NOx/Air 80-99 NOx/Air 5-29.9 NOx/Air 1-4.9 NOx/Air	EPA-2-AIR-XX-DN	660
<b>CO in N2</b> 1-10% CO/N2 100-9999 PPM CO/N2 10-99 PPM CO/N2 8-9.9 PPM CO/N2 .5-7.9% CO/N2	EPA-2-NIT-XX-DN	350	<b>O2 in N2</b> 23-49% O2/N2 5-22.9% O2/N2 0.8-4.9% O2/N2	EPA-2-NIT-XX-DN	<23% O2 - 590 >23% O2 - 296
<b>H2S in Air</b> 100-999 PPM H2S/Air 10-99 PPM H2S/Air 1-9.9 PPM H2S/Air	EPA-2-AIR-XX-DN	330	<b>C3H8 in Air</b> 1000-6000 PPM C3H8/Air 100-999 PPM C3H8/Air 1-99 PPM C3H8/Air	EPA-2-AIR-XX-DN	590
<b>H2S in N2</b> 100-999 PPM H2S/N2 10-99 PPM H2S/N2 4-9.9 PPM H2S/N2 1-3.9 PPM H2S/N2	EPA-NIT-XX-DN	330	<b>SO2 in Air</b> 500-4999 PPM SO2/Air 100-499 SO2/Air 40-99 SO2/Air 10-39 SO2/Air	EPA-2-AIR-XX-DN	660
<b>CH4 in Air</b> > 1 PPM CH4/Air < 1 PPM CH4/Air	EPA-2-AIR-XX-DN	590	<b>SO2 in N2</b> 500-4999 PPM SO2/N2 100-499 SO2/N2 40-99 SO2/N2 10-39 SO2/N2	EPA-2-NIT-XX-DN	660
<b>CH4 in N2</b> > 1 PPM CH4/N2 <1 PPM CH4/N2	EPA-2-NIT-XX-DN	350	<b>C3H8 in N2</b> 1000 PPM C3H8/N2 100-999 C3H8/N2 1-99 C3H8/N2	EPA-2-NIT-XX-DN	350

XX - Complete the part number with the desired cylinder size.  
DN - Description number assigned by manufacturing location.

3 and 4 Component Mixtures available with concentrations of minor components as listed in this section. Please contact the nearest Sales Office for pricing and availability.

Recommended Equipment
400 series stainless steel regulator, see page 4.18

Cylinder Sizes *	Contents
150A	150 cf
80A	80 cf
35A	35 cf



## Portable Calibration Standards

3

### Refillable, Portable Calibration Gases

The portable calibration gas cylinder is an alternative to standard disposable cylinders. The Enviro-Cyl™ calibration gas cylinder offers many advantages over disposables:

- portable light weight refillable
- economical 50 - 100% more capacity than disposables
- no cylinders to dispose of...simply return for refill
- eliminates disposal fees and regulatory paperwork
- no more problems with landfills or recycling
- cost efficient; no deposits or rental fees



C-10

#### C10 Cylinder Specifications

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Refillable aluminum cylinder</li> <li>• 105 liters capacity at 1100 psi</li> <li>• 12.5" tall</li> <li>• 3.2" diameter</li> </ul> | <ul style="list-style-type: none"> <li>• C-10 valve connection</li> <li>• 5 year DOT stamp</li> <li>• Safety on cylinder valve</li> <li>• Stainless steel valve</li> </ul> |
|--|--|

#### EC180 Cylinder Specifications

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Refillable aluminum cylinder</li> <li>• Up to 160 liter capacity at 2200 psig</li> <li>• 14" tall (with valve)</li> <li>• 3.2" diameter</li> </ul> | <ul style="list-style-type: none"> <li>• CGA 180/110 connection</li> <li>• 5 year DOT stamp</li> <li>• Safety on cylinder valve</li> <li>• Brass or Stainless steel valves</li> </ul> |
|---|---|



EC-180



#### Complete, Portable Calibration Kits

- |  |
|--|
| <ul style="list-style-type: none"> <li>• Sturdy carrying case</li> <li>• Enviro-Cyl™ refillable cylinder(s) or "One Timers" disposable cylinders</li> <li>• A regulator/flowmeter</li> <li>• Tedlar sample bags - available</li> <li>• Calibration tubing - available</li> </ul> |
|--|

## Portable Calibration Standards

3

One Timers are perfect for all your calibration applications. They cover a broad range of applications from industrial hygiene to petrol chemical.

One Timers provide outstanding quality, performance, and value. They also eliminate cylinder rental and demurrage charges, and the added portability of these cylinders makes them perfect for small jobs.

### 103 Liter Steel Disposable Cylinder for Non-Reactive Gas

- Steel disposable
- 103 liter low pressure capacity
- Cylinder height: 13.77"
- Cylinder diameter: 3.27"
- CGA: C-10 5/8" - 18 UNF
- Contents: 103 liters
- Weight: 2.3 lbs
- Service pressure: 1000 psi
- DOT Specs: 39 steel cylinder



### 34 Liter Steel Disposable Cylinder for Non-Reactive Gas

- Steel disposable
- 34 liter low pressure capacity
- Cylinder height: 10.75"
- Cylinder diameter: 3"
- CGA: 600
- Contents: 34 liters
- Weight: 1.8 lbs
- Service pressure: 500 psi
- DOT specs: 39 steel cylinder



### 17 Liter Steel Disposable Cylinder for Non-Reactive Gas

- Steel disposable
- 17 liter low pressure capacity
- Cylinder height: 10.75"
- Cylinder diameter: 3"
- CGA: 600
- Contents: 17 liters
- Weight: 1.1 lbs
- Service pressure: 250 psi
- DOT specs: 39 steel cylinder



### 58 Liter Aluminum Disposable Cylinder for Reactive Gas

- Aluminum disposable
- 58 liter low pressure capacity
- Cylinder height: 14.25"
- Cylinder diameter: 3.5"
- Outlet Fitting: C-10 5/8" 18 UNF
- Contents: 58 liters
- Weight 1.6 lbs
- Service pressure: 500 psi
- DOT specs: 39 NRC aluminum cylinder



### 29 Liter Aluminum Disposable Cylinder for Reactive Gas

- Aluminum disposable
- 29 liter low pressure capacity
- Cylinder height: 10.64"
- Cylinder diameter: 3"
- Outlet Fitting: C-10 5/8" 18 UNF
- Contents: 34 liters
- Weight 1.3 lbs
- Service pressure: 500 psi
- DOT specs: 39 NRC aluminum cylinder



## Portable Calibration Standards

All Portable Gas Standards are manufactured to meet certified standards and are manufactured with NIST traceable standards. These standards are also manufactured under ISO 17025 Quality Requirements.

### Confined Space Standards

Entry into confined spaces require testing for several contaminants.

4 & 5 Component Mixtures normally contain the following products, but the minor components can vary. The concentrations of these components can vary according to the equipment manufacturer. Please check with your equipment manufacturer as to the exact mixture you need.

5 Component Mixture	Part No.	4 Component Mixture	Part No.
Hydrogen Sulfide Carbon Monoxide Methane Oxygen Balance Nitrogen	CS-5-NIT-XX-DN	Hydrogen Sulfide Carbon Monoxide Methane Balance Nitrogen	CS-4-NIT-XX-DN

### Common Environmental Compliance Mixtures

Environmental Compliance Mixtures are primarily for remediation and testing. These are normally just two component mixtures, but additional minor components are available.

	Part No.		Part No.
Isobutylene Balance Air	CS-2-AIR-XX-DN	Carbon Monoxide Balance Air	CS-2-AIR-XX-DN
Propane Balance Nitrogen	CS-2-NIT-XX-DN	HCFC 134a Balance Nitrogen	CS-2-NIT-XX-DN
Methane Balance Air	CS-2-AIR-XX-DN	Chlorine Balance Nitrogen	CS-2-NIT-XX-DN
Ammonia Balance Nitrogen	CS-2-NIT-XX-DN	Ethylene Oxide Balance Nitrogen	CS-2-NIT-XX-DN

Additional minor components are available. Please contact the nearest Sales office for additional details.

BTEX Standards	Part No.		
Benzene Toluene Ethyl Benzene o-Xylene Balance Nitrogen	CS-5-NIT-XX-DN		

Disposable Cylinder Sizes	Approximate Contents	Connection
58AL*	58 Liters	C-10
29AL*	29 Liters	C-10
103S	103 liters	C-10
34S	34 Liters	CGA 600
17S	17 Liters	CGA 600
Refillable-Cylinders		
C-10*	105 Liters	C-10
C-180*	160 Liters	CGA 180/110

XX - Complete the part number with the desired cylinder size.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

Regulators for Portable Calibration Standards, see page 4.66

Calibration Kits and Accessories Available

\* Aluminum Cylinders recommended for reactive gases

[purityplusgases.com](http://purityplusgases.com)

## Flame Ionization Fuel Mixtures

3

These mixtures are used with Flame Ionization Detectors (FIDs) in gas chromatography or Total Hydrocarbon Analyzer (THC) when analyzing for trace quantities of hydrocarbons. Please refer to the Pure Gas section for Zero and Hydrocarbon Free grades of air, argon, helium, hydrogen, nitrogen, and oxygen carrier gases.

FID Fuel	Part No.	Cylinder Size	Contents	Connection
40% Hydrogen	FID-2-NIT-XX-DN	300	266 cf	350
60% Nitrogen		200	203 cf	350
40% Hydrogen	FID-2-HEL-XX-DN	300	259 cf	350
60% Helium		200	195 cf	350

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulators, see page 4.12

## Leak Detection Mixtures

Leak detection mixtures are used with special instrumentation designed to detect the minor component at very low concentrations. The primary use is to detect very minute leaks in gas systems.

Leak Detection Mixtures	Part No.	Cylinder Size	Contents	Connection
.5%-10% Helium	LDM-2-NIT-XX-DN	300	285	580
Balance Nitrogen		200	210	580
50ppm-1% Sulfur Hexafluoride	LDM-2-NIT-XX-DN	300	289	580
Balance Nitrogen		200	213	580
1%-5% Sulfur Hexafluoride	LDM-2-NIT-XX-DN	300	292	580
Balance Nitrogen		200	215	580

XX - Complete the part number with the desired cylinder size listed above.  
DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulators, see page 4.12

## Laser Mixtures

3

Source Material Purities::	
Carbon Dioxide:	99.995%
Nitrogen	99.999%
Helium	99.999%
Carbon Monoxide:	99.5%
Hydrogen	99.99%

The concentration of the minor components in the mixture shall be within +/- 5% relative of the requested concentration. Tighter blend tolerances, and specific certifications are available.

Carbon Dioxide Laser Mixtures	Part No.	Cylinder Size	Contents	Connection
3.4% CO <sub>2</sub> / 15.6% N <sub>2</sub> / He	LZR-4-HEL-XX-DN	300	264 cf	580
4.5% CO <sub>2</sub> / 13.5% N <sub>2</sub> / He	LZR-4-HEL-XX-DN	200	200 cf	
6% CO <sub>2</sub> / 18% N <sub>2</sub> / He	LZR-3-HEL-XX-DN			
4.5% CO <sub>2</sub> / 13.5% N <sub>2</sub> / He	LZR-3-HEL-XX-DN			
5% CO <sub>2</sub> / 40% N <sub>2</sub> / He	LZR-3-HEL-XX-DN			
2% CO / 6% CO <sub>2</sub> / 6% N <sub>2</sub> / He	LZR-4-HEL-XX-DN	300	229 cf	350
2% CO / 8% CO <sub>2</sub> / 8% N <sub>2</sub> / He	LZR-4-HEL-XX-DN	200	167 cf	
2% CO / 8% CO <sub>2</sub> / 16% N <sub>2</sub> / He	LZR-4-HEL-XX-DN			
4% CO / 8% CO <sub>2</sub> / 16% N <sub>2</sub> / He	LZR-4-HEL-XX-DN			
4% CO / 8% CO <sub>2</sub> / 16% He / N <sub>2</sub>	LZR-4-HEL-XX-DN			
4% CO / 8% CO <sub>2</sub> / 28% He / N <sub>2</sub>	LZR-4-HEL-XX-DN			
0.4% H <sub>2</sub> / 4% CO / 8% CO <sub>2</sub> / 8% N <sub>2</sub> / He	LZR-4-HEL-XX-DN	300	229 cf	350
0.4% H <sub>2</sub> / 4% CO / 6% CO <sub>2</sub> / 12% N <sub>2</sub> / He	LZR-4-HEL-XX-DN	200	167 cf	

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

601 series laser regulator, see page 4.56

\*Other combinations and sizes available upon request

## TCD Carrier Gas Mixture

This mixture is intended to enhance the sensitivity of a chromatograph using a thermal conductivity detector.

TCD Carrier Gas Mixture	Part No.	Cylinder Size	Contents	Connection
8.5% Hydrogen	TCD-2-HEL-XX-DN	300	262 cf	350
91.5% Helium		200	192 cf	350

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulators, see page 4.12

## Spark Chamber Mixtures

Used as the medium for atomic particle studies.

Spark Chamber Mixtures	Part No.	Cylinder Size	Contents	Connection
10% Helium 90% Neon	SCM-2-NE-XX-DN	300	269	580
		200	201	580
		150A	135	580
20% Helium 80% Neon	SCM-2-NE-XX-DN	300	269	580
		200	201	580
		150A	135	580
25 % Helium 75% Neon	SCM-2-NE-XX-DN	300	269	580
		200	201	580
		150A	135	580

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulators, see page 4.12

## Multi-Component Hydrocarbon Mixtures

3

Today's gas and oil industries are more demanding than ever. With critical specifications and tolerances tighter than ever, it is imperative, for continued top level operation, that **gas and liquid standards** be manufactured with the highest quality gases in the highest quality labs. Our hydrocarbon gases are manufactured to meet the most stringent requirements that our customers demand. Whether your hydrocarbon requirement is for a refinery, petrochemical plant, chemical plant, or gas processing plant you can depend on PurityPlus gases to meet your processing challenges with reliable gas standards the first time, every time. Five, ten, twenty or more components mixtures are routine for us. For pricing and delivery, please contact the nearest sales office with your mixture requirements.

### Typical reference standards can include any or all of the following gases.

Argon	Hydrogen Sulfide
Benzene	Isobutane
1-3 Butadiene	Isobutylene
n-Butane	Isopentane
cis-2-Butene	Isoprene
trans-2-Butene	Methane
1-Butene	2-Methylpentane
Carbon Dioxide	3-Methylpentane
Carbon Monoxide	Nitrogen
Cyclohexane	n-Nonane
Cyclopentane	n-Octane
n-Decane	n-Pentene
2,2 Dimethyl butane	Propane
n-Dodecane	Propylene
Ethane	Neopentane
Ethylene	n-Tridecane
Helium	n-Undecane
n-Heptane	

### Recommended Equipment

300 series brass regulators, see page 4.12

\*For mixtures containing hydrogen sulfide:  
400 series stainless steel regulators, see page 4.18



## Liquid Hydrocarbon Mixtures

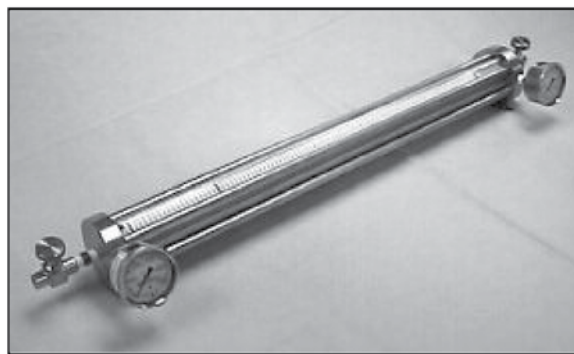
3

Liquid Hydrocarbon Standards are often required for analysis of liquid petroleum gas or liquefied hydrocarbon streams. PurityPlus liquid hydrocarbon standards are available in low pressure cylinders with dual valves and/or full length eductor tubes. When the composition of these mixtures span a wide range of vapor pressures and boiling points, we recommend the use of Welker Piston Cylinders to provide constant supply pressure and limit fractionalization of the mixture. These cylinders can supply up to 3600 PSI working pressure by applying equivalent nitrogen pressure to the gas side of the piston, thus maintaining the pressure and mixture you need. This cylinder is available in several volumes and can be refilled.

Please contact your nearest sales office for pricing of mixtures and cylinders.



Welker Engineering Constant Pressure Sample Cylinder  
style cp-42-ga



Welker Engineering High Pressure DOT Cylinder  
style cp2-hp



## Semiconductor Gases

3

PurityPlus gas manufacturers are committed to the semiconductor industry with the implementation of our ISO Quality Management Program. From silanes to dopant gases to etchant gases and purge gases, the network of PurityPlus manufactures have implemented the strict SOPs and QA procedures to meet the semiconductor industry demands. The table below outlines the available process gases. For detailed information, please contact the nearest sales office.

PurityPlus gas manufacturers have been supplying electronic grade gases to the semi-conductor industry since its inception. We currently supply bulk hydrogen, nitrogen, argon, and oxygen to many semiconductor manufacturers. We also supply cylinder gases to the exacting demands of this industry. If you have an electronic gas requirement please contact us for pricing and availability.

Silanes	Dopants	Etchants	Purge Gases	Other
Silane - SiH <sub>4</sub>	Arsine - AsH <sub>3</sub>	Chlorine - Cl <sub>2</sub>	Argon - Ar	Ammonia - NH <sub>3</sub>
Dichlorosilane - SiH <sub>2</sub> Cl <sub>2</sub>	Phosphine - PH <sub>3</sub>	Hydrogen Bromide - HBr	Helium - He	Carbon Dioxide - CO <sub>2</sub>
Disilane - Si <sub>2</sub> H <sub>6</sub>	Boron Trifluoride - BF <sub>3</sub>	Hydrogen Chloride - HCl	Hydrogen - H <sub>2</sub>	Nitrous Oxide - N <sub>2</sub> O
Silicon Tetrachloride - SiCl <sub>4</sub>		Sulfur Hexafluoride - SF <sub>6</sub>	Nitrogen - N <sub>2</sub>	
Trichlorosilane - SiHCl <sub>3</sub>		Halocarbon 14 - CF <sub>4</sub>	Oxygen - O <sub>2</sub>	
		Halocarbon 22 - CHClF <sub>2</sub>		
		Halocarbon 23 - CHF <sub>3</sub>		
		Halocarbon C318 - C <sub>4</sub> F <sub>8</sub>		

### Recommended Equipment

432 series regulator, see page 4.24

## Medical Gases

PurityPlus Medical Gases are manufactured in compliance to FDA current Good Manufacturing Practices (cGMPs). Our manufacturing facilities are independently audited by a third party auditor, as well as by the FDA (in Canada, the Health Products and Food Branch Inspectorate - HPFBI) to insure stringent compliance with all applicable regulations.

Our Medical Gases are manufactured to meet all U.S. Pharmacopeia (USP) and National Formulary (NF) specifications in accordance with cGMPs.

IWDC Members provide a full range of gases and related equipment for the Healthcare, Pharmaceutical, and Biotechnology fields. We use state-of-the-art filling facilities and analytical laboratories to provide high purity gases and high accuracy mixtures for all research, inhalation, and diagnostic applications.

We carry a full line of cryogenic equipment including cryogenic freezers, liquid withdrawal devices, and personal safety equipment. We have a full line capability from portable liquid containers, to micro and mini-bulk systems, to large bulk gas installations.

Included in this section are the most common medical gases and medical gas mixtures. Depending on use, special request mixtures may require additional approvals.



## Medical Gases

3

Product	Part No.	Purity	Impurity	Maximum	Cylinder Size	Contents	Connection
<b>Medical Air</b> Purified natural air or a blend of oxygen and nitrogen. Contains 19.5 to 23.5 vol% Oxygen	AIR-USP-XX	Oxygen	CO	≤ 10ppm	200	233 cf	346
		19.5-23.5%	CO <sub>2</sub>	≤ 500 ppm	20	23 cf	950
		Bal N <sub>2</sub>	SO <sub>2</sub>	≤ 5 ppm	10	14 cf	950
			NO + NO <sub>2</sub>	≤ 2.5 ppm			
			Odor:	None			
			Condensed H <sub>2</sub> O:	None			
			Condensed Oil:	None			
<b>Carbon Dioxide USP</b> Chemical Symbol: CO <sub>2</sub>	CDI-USP-XX	> 99.0%	H <sub>2</sub> S < 1 ppm	≤ 1 ppm	200	64 lb	320
			CO	≤ 10 ppm	20	6.5 lb	940
			NO	≤ 2.5 ppm	10	4.0 lb	940
			NH <sub>3</sub>	≤ 25 ppm			
			SO <sub>2</sub>	≤ 5 ppm			
			H <sub>2</sub> O	≤ 200 ppm			
			NO <sub>2</sub>	≤ 2.5 ppm			
<b>Carbon Dioxide Cryogenic Liquid</b>					170L	378 lb	Gas-320 Liq.-172
<b>Helium USP</b> Chemical Symbol: He	HEL-USP-XX	> 99.0%	CO	≤ 10 ppm	200	218 cf	580
			Air	≤ 1.0%	20	22 cf	930
			Odor:	None	10	13 cf	930

XX - Complete the part number with the desired cylinder size listed above.

### Recommended Equipment - Gas Cyls

200 series brass regulator, page 4.8  
305 series brass regulator, page 4.12  
315 series brass regulator, page 4.16

### Cryogenic Product

See Cryogenic Equipment Section, page 4.134

\*Nonstandard cylinder sizes available upon request

Medical Gases

Product	Part No.	Purity	Impurity	Maximum	Cylinder Size	Contents	Connection
Nitrogen NF	NIT-USP-XX	≥ 99.0%	CO	< 10 ppm	200	228	580
			O2	≤ 1.0%	20	23	960
			Odor:	None	10	14	960
Nitrogen NF Cryogenic Liquid					160L	3690	gas-580
					180L	4110	Liq.-295
Nitrous Oxide USP	N2O-USP-XX	≥ 99.0	CO	≤ 10 ppm	200	64 lb	326
			Air	≤ 1.0%	20	6.4 lb	910
			CO2	≤ 300 ppm	10	3.9 lb	910
			NO	≤ 1 ppm			
			NO2	≤ 1 ppm			
			NH3	≤ 25 ppm			
			Halogens H2O	≤ 1 ppm ≤ 200 ppm			
Oxygen USP**	OXY-USP-XX	≥ 99.0%	CO	≤ 10 ppm	200	249 cf	540
			CO2	≤ 300 ppm	20	25 cf	870
			Odor	None	10	15 cf	870
Oxygen Cryogenic Liquid					160L	4580 cf	Gas-540 Liq-440

XX - Complete the part number with the desired cylinder size listed above.

**Recommended Equipment**

200 series brass regulator, see page 4.8  
305 series brass regulator, page 4.12  
315 series brass regulator, page 4.16

**Cryogenic Product**

See Cryogenic Equipment Section, page 4.158

\*Nonstandard cylinder sizes available upon request

\*\*Oxygen that is produced by the air-liquefaction process is exempt from the requirements of the tests for carbon dioxide and carbon monoxide.

## Medical Gases

3

Medical Drug Gases - Therapy	Part No.	Cylinder Size	Contents	Connection
5% Carbon Dioxide in Oxygen	USP-2-OXY-XX-DN	200	226 cf	280
10% Carbon Dioxide in Oxygen	USP-2-OXY-XX-DN	200	226 cf	500
20% Oxygen in Helium	USP-2-HEL-XX-DN	200	199 cf	280
30% Oxygen in Helium	USP-2-HEL-XX-DN	200	199 cf	280
Medical Device Gases - Diagnostic - Certified Standards*	Part No.	Cylinder Size	Contents	Connection
Lung Diffusion Gases				
0.3% Carbon Monoxide, 10% Helium, 21% Oxygen in Nitrogen	MDV-4-NIT-XX-DN	200	209 cf	500
0.3% Carbon Monoxide, 0.5% Neon, 21% Oxygen in Nitrogen	MDV-4-NIT-XX-DN	200	213 cf	500
0.3% Carbon Monoxide, 0.3% Methane, 21% Oxygen in Nitrogen	MDV-4-NIT-XX-DN	200	213 cf	500
0.3% Acetylene, 0.3% Carbon Monoxide, 0.3% Methane, 21% Oxygen in Nitrogen	MDV-5-NIT-XX-DN	200	213 cf	500
Blood Gas Mixtures				
2-14% Carbon Dioxide in Nitrogen	MDV-2-NIT-XX-DN	200	228 cf**	500
7-12% Carbon Dioxide in Oxygen		200	233 cf**	500
1-19% Oxygen in Nitrogen		200	228 cf**	500
2-12% Carbon Dioxide, 12-15% Oxygen in Nitrogen	MDV-3-NIT-XX-DN	200	228 cf**	500
			** Contents Approximate	

XX - Complete the part number with the desired cylinder size listed above.

DN - Description number assigned by manufacturing location.

### Recommended Equipment

300 series brass regulator, see page 4.12

\*Primary Standard Grade Mixtures are also available

\*Nonstandard cylinder sizes available upon request

\*Additional custom blends are available upon request



# Notes:

3

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---



# EQUIPMENT

 **PurityPlus**<sup>®</sup>  
SPECIALTY GASES



## Section 4 - Equipment

How to choose a regulator .....	4.2
How to Order PurityPlus Regulators .....	4.3
Recommended Regulator Chart .....	4.4 - 4.7

### Regulators

#### Cylinder Regulators

202 Series – Single Stage, Brass .....	4.8
203 Series – Single Stage, Brass .....	4.10
205 Series – Single Stage, Brass .....	4.12
206 Series – Single Stage, Brass .....	4.14
212 Series – Two Stage, Brass .....	4.16
213 Series – Dual Stage, Brass .....	4.18
302 Series – Single Stage, Brass .....	4.20
305 Series – Single Stage, Brass .....	4.22
312 Series – High Purity, Two Stage, Brass .....	4.24
315 Series – Dual Stage, Brass .....	4.26
420 Series – Single Stage, SS .....	4.28
422 Series – High Purity, Single Stage, Corrosion Resistant, SS .....	4.30
430 Series – Dual Stage, SS .....	4.32
432 Series – High Purity, Two Stage, Corrosion Resistant, SS .....	4.34
401 Series – Single Stage, Chrome-plated brass .....	4.36
408 Series – High Purity, Single Stage, Aluminum .....	4.38
411 Series – Dual Stage, Chrome-plated brass .....	4.40
308 Series – Single Stage, Brass, Heated .....	4.54
322 Series – Single Stage, SS .....	4.56
425 Series – Single Stage, SS .....	4.58
455 Series – Corrosion Resistant, Electroless Nickel-plated brass .....	4.68
486 Series – Single Stage, SS .....	4.70
492 Series – Single Stage, Brass, 6000 PSIG .....	4.72
493 Series – Single Stage, Ultra High Pressure .....	4.74
601 Series – Laser Regulator, Internal Purge .....	4.76
3550 Series – Two Stage, Corrosion Resistant, SS .....	4.78
3470 Series – Single Stage, Corrosion Resistant, Nickel Plated Brass .....	4.79
3700HP Series – Single Stage, Low Pressure, Zinc .....	4.80
Regulators for Portable Calibration Standards .....	4.86
Series EZ3000 – Easy-Mount Regulator Bracket .....	4.168

#### Disposable Cylinder Regulators

3960 Series – Fixed Flow Regulator for Non-Corrosive Gases .....	4.83
3962 Series – SS Fixed Flow Regulator for Corrosive Gases .....	4.84
3970 Series – Regulator for Non-Corrosive Gases .....	4.85

#### Line Regulators

304 Series – Single Stage, Brass .....	4.42
324 Series – Single Stage, SS .....	4.44
403 Series – Single Stage, Brass .....	4.46
445 Series – Single Stage, SS .....	4.48
483 Series – High Flow, Single Stage, Brass .....	4.50
484 Series – High Flow, Single Stage, Brass, Smooth Finish .....	4.52
428 Series – High Purity, Single Stage, Chrome Plated Brass .....	4.64
429 Series – High Purity, Single Stage, SS, Corrosion Resistant .....	4.66

#### Flow Regulators

Series 3950 – Demand Flow Regulator .....	4.81
Series 3980 – Adjustable Fixed Flow Regulator .....	4.82

#### Lecture Bottle Regulators

325 Series – Single Stage, Chrome-Plated Brass .....	4.60
3910 Series – Single Stage, Chrome Plated Brass, Compact Design .....	4.62
3920 Series – Single Stage SS, Compact Design .....	4.62

#### Misc. Lecture Bottle Equipment

Model 475 – Lecture Bottle Stand .....	4.63
Model 480 – Lecture Bottle Bracket .....	4.63
Model 3990 – 3993 – Lecture Bottle Control Valves .....	4.63

#### Manifolds

529 Series – Protocol Switchover Station .....	4.88
529 Series – Protocol Switchover Station Alarm .....	4.92
918 Series – Auto-Logic II Changeover Manifold .....	4.93
919 Series – Ultra-Logic II Changeover Manifold .....	4.95
522 Series – Auto Switch .....	4.97
523 Series – Auto Switch, Corrosion Resistant .....	4.99
536 Series – Auto Switch GL .....	4.101
537 Series – Auto Switch GL, Corrosion Resistant .....	4.103
538 Series – IntelliSwitch II .....	4.105
539 Series – IntelliSwitch Electronic Switchover .....	4.107
544 Series – IntelliSwitch Systems .....	4.109
540 Series – Back-up Panel .....	4.111
515 Series – SilcoNert 1020 Switchover .....	4.113
526 Series – Semiautomatic Changeover .....	4.115
526 LC Series – Automatic Changeover .....	4.117
547 Series – Switchover .....	4.119
527 Series – Semiautomatic Changeover, Corrosion Resistant .....	4.121
530 Series – High Pressure Automatic Switchover System .....	4.123
Advantium 1 – 1 Input Remote Manifold Alarm .....	4.125
Advantium 2 – 2 Input Remote Manifold Alarm .....	4.125
Advantium 16 System Monitor .....	4.126
Point of Use Panels .....	4.128
52 Series – Maniflex, modular manifolds .....	4.131
52L Series – Micromanifold .....	4.133
53 Series – Point of use panel .....	4.135
52V Series – Panels .....	4.137
Series 9900 Low Pressure Gas Alarm .....	4.196

#### Flowmeters

Tutorial .....	4.140
Series 7920 – Tube Cube .....	4.141
Series 7950 – Gas Proportioner .....	4.143
Series 7974 & 7975 – Large Flow Acrylic .....	4.144
Series 7923 – Economic Acrylic .....	4.145
Series 810C – Mass-Trak Mass Flowmeter .....	4.146
Series A820 – Top-Trak Mass Flowmeter .....	4.148

#### Purifiers and Filters

Series 6200 – Indication Oxygen Trap .....	4.150
Series 6210 – Oxygen Removing Purifier for Hydrogen .....	4.151
Series 6300 – Oxygen Trap .....	4.152
Series 6400 – Carbon Dioxide Trap .....	4.153
Series 8000 – High Capacity Water and Oil .....	4.154
Series 8010 – High Pressure Water and Oil .....	4.155
Series 8012 – 120 cc Indicating Purifier .....	4.156
Series 8020 – 200 cc Indicating Purifier .....	4.156
Series 8040 – 400 cc Indicating Purifier .....	4.156
Series 8050 – 735 cc and 1500 cc Purifiers .....	4.156
Series 8200 – Hydrocarbon Trap .....	4.157
Series 5010 – 0.01 Micron Filter .....	4.158
Series 7010 – Depth Gas Filters - 0.01 Microns .....	4.159
Series 7500 – In-Line Filter .....	4.195

## Section 4 - Equipment

### Purge Assemblies

502 Series – Straight Purges.....	4.166
Series 4800 – Cross Purge, SS.....	4.197
Series 4500 & 4600– Tee Purge, Brass or SS .....	4.198
502 Series – Deep purges and Tee purges .....	4.199
Model MK1V – Welding Purge Monitor .....	4.203

### Gas Detection Systems

Model 3-033-R002 – SF6 Leak Detector.....	4.170
Model 21-070 – Mini Gas Leak Detector .....	4.171
Beacon 100 – Single Point Controller.....	4.172
Beacon 200 – Two Point Controller .....	4.172
Beacon 800 – Eight Point Controller .....	4.172
Eagle Portable Gas Detector.....	4.176
Series 72 & 73 – Single Gas Personal Monitor .....	4.178
580 Series – Air Safety Monitors .....	4.179

### Bio Medical/Cryogenic Equipment

Accessories .....	4.204
Director™ Storage Vessels.....	4.204
Liquid Nitrogen Shipping Vessels .....	4.205
Dewars .....	4.206
Refrigerators .....	4.207
Whisper Valve™ .....	4.208
Series CTM75 – Automatic Switchover Manifolds for Cryogenic Liquid Supply .....	4.209

### Cylinder Connections

CGA Connections .....	4.191
Cylinder Connections.....	4.192
DISS Connections .....	4.193
DISS Gaskets .....	4.193

### Valves

Series 8100 – Miniature Forged Needle Valves .....	4.164
Series 8400 – Check Valves.....	4.164
Series 8300 – High Purity Packless Diaphragm Valves .....	4.165
533 Series – High Flow Diaphragm Valves .....	4.166
Series 8600 – Relief Valves .....	4.167
Series 8500 – Manual Control Valves .....	4.168
586 Series – Shut Off Valve.....	4.169
585 Series – Excess Flow Switches .....	4.202

### Miscellaneous

Wall Mounted Protocol Switchover Stations .....	4.87
Flexible Hoses and Transfer Hoses.....	4.89
542 Series – High Flow Backup .....	4.90
Leak Detector Solution .....	4.139
Electronic Cylinder Scales .....	4.160
Liquefied Gas Cylinder Scale .....	4.161
Flash Arrestors.....	4.162
Cylinder Brackets.....	4.180
Small Cylinder and Large Cylinder Stands.....	4.181
Cylinder Floor Stands .....	4.182
Gas Process Stations .....	4.183
Cylinder Storage Racks .....	4.184
Cylinder Hand Trucks .....	4.185
Gas Safety Storage Cabinets .....	4.186
C-Series Gas Cabinet Systems.....	4.187
Cylinder Wrenches.....	4.189
Flexible Stainless Steel Hoses .....	4.190
Pressure Gauges.....	4.194
Gas Heater .....	4.195
585 Series – Emergency Shut Off Controller .....	4.200
585 Series – Emergency Stop Button .....	4.202
Dry Ice Makers.....	4.203

## How to Choose a Regulator

While all regulators can reduce pressure in a gas system, PurityPlus high purity regulators conform to very exacting standards of pressure control. Below, we discuss some bases of comparison that can help you navigate this catalog and choose a regulator that best suits your needs. Of course, your nearest PurityPlus sales office would be happy to answer any further questions you may have about regulator design and operation.

### Single Stage vs. Dual Stage

Single stage regulators reduce pressure in a single step to deliver a pressure within a specific range. Regulators designed in this way will show a slight variation in delivery pressure as the cylinder pressure falls during use. For this reason, single stage regulators are best suited for applications where a constant outlet pressure is not critical, where an operator can monitor and readjust pressure, or where inlet pressure is constant.

Dual stage regulators perform the same function as single stage regulators. However, delivery pressure remains constant as cylinder pressure decreases and greater accuracy in pressure control is maintained because the pressure reduction is performed in two steps. Dual stage regulators are recommended for applications requiring a constant outlet pressure over the life of a gas cylinder.

### Helium Leak Integrity

Helium leak integrity is a measure of how well a regulator prevents gases from leaking into or out of a regulator body. The measured quantity is expressed as a flow rate such as  $1 \times 10^{-9}$  cc/sec He (1 billionth of a cc/sec). In this case, a Helium Leak integrity rating of  $1 \times 10^{-9}$  would indicate that the regulator would leak enough gas to fill a cubic centimeter every 33 years. If the rating were  $1 \times 10^{-3}$  the regulator would leak enough gas to fill a cubic centimeter in just 17 minutes.

Helium is used as the test gas because it is chemically inert, it is easy to detect, and it is an extremely small molecule able to pass through the smallest leak. The lower the helium leak specification, the better the regulator will be at preventing leaks into the atmosphere and at minimizing contamination from gases outside the body.

### Materials of Construction

The materials of construction for a regulator should be based on the properties and purity of the gas. PurityPlus offers regulators made of brass, aluminum, and 316L stainless steel. Brass is compatible with most of the non-reactive gases. A choice of forged body or barstock construction is available. Forged body regulators are economical; however, their internal surface finishes are relatively rough as compared to barstock body regulators. Barstock body regulators have all wetted surfaces machined to a smooth finish which reduces the possibility of contamination. 316L stainless steel is highly corrosion resistant and is suitable for use with many of the highly corrosive gases in their anhydrous form. Aluminum is an economical lightweight alternative to stainless steel for many of the mildly corrosive gases. Refer to the Regulator Selection Chart on pages 4.3-4.5 or consult your nearest PurityPlus sales office to determine suitable materials of construction.

### Cylinder Connections

PurityPlus offers cylinder connections which conform to all worldwide standards. In the US the Compressed Gas Association (CGA) has designated specific cylinder connections for each gas service and pressure rating. Refer to CGA publication V-1 for more information. A few of the international standards PurityPlus provides include DIN 477, BS 341, JIS (Japan), and KS (Korea). Please note that a CGA connection limits the temperature range of a regulator to the guidelines of the connection.

### Flow Charts

The flow charts on each catalog page are a graphical representation of test results which show the change in outlet pressure with varying flow rate. To use the chart, determine the maximum no-flow pressure permitted by your system. Locate this pressure on the vertical axis of the chart. If there is no curve for your specific condition, interpolate a curve. Follow the curve to the desired flow rate on the horizontal scale. Read horizontally to the left to determine the corresponding pressure drop. Because flow rate is dependent on inlet pressure, data is presented at full cylinder pressure (2000 PSIG), partially full (500 PSIG) and nearly empty (200 PSIG).

### Diaphragms

The diaphragm is a sensing element crucial to the function of the regulator and the purity of gas delivery. Stainless steel diaphragms are corrosion resistant and have low leakage rate characteristics. Neoprene diaphragms may offer more sensitive pressure control, but do not offer the gas purity of stainless steel. Coating a neoprene diaphragm with PTFE enhances gas purity greatly.

### Specific Applications

While a single or dual stage regulator of the appropriate material will suffice in most gas service, some applications require specially designed regulators. For example in the 400 Series, the 455 Series regulators are specifically designed for use with highly corrosive gases and the 492 Series regulators can safely deliver gas at extremely high pressures. If you are unsure about your requirements, please contact your IWDC distributor for assistance.

**Ordering PurityPlus Regulators**

In accordance with our philosophy of flexible design, PurityPlus has developed a versatile modular manufacturing system to accommodate any individual requirement. With all the options PurityPlus offers, listing discrete part numbers for each regulator series would be impossible. Therefore, we have created a part number matrix which allows you to design a regulator to meet the needs of any application.

- Step One** The first choice in completing the Part Number Matrix is selecting a particular regulator series. Determine which regulator series are compatible with the gases involved in the application by consulting the Regulator Selection Chart on pages 4.3-4.5. For further criteria, consider page 4.1 entitled Choosing a Regulator and finally the description of each regulator series in this catalog. If you are having problems deciding, please contact your nearest PurityPlus sales office for assistance. The regulator series number then becomes the first three digits of the part number.
- Step Two** Select the desired outlet pressure range from those available in the A column. The selection of an outlet pressure range automatically specifies the outlet pressure gauge which appears in the adjacent column. For example, a regulator with a 0-250 PSIG outlet pressure range will have a 0-400 PSIG pressure gauge installed.
- Step Three** Choose the inlet pressure gauge from those available in the B column. While the most common cylinder pressure is between 2200 PSIG and 2400 PSIG, several gases are stored in cylinders at other pressures. Choosing the inlet gauge with a range that most closely approximates the actual pressure range of the cylinder allows easy readability of cylinder contents. Please note that by indicating the 0-6000 PSIG inlet gauge, you are also selecting a special PCTFE Capsule® with a maximum inlet pressure of 4500 PSIG.
- Step Four** Indicate the outlet assembly desired from those available in the C column. Since there are a wide variety of tubing and piping systems in use, the matrix accommodates virtually any style of connection, eliminating the need for adapters and reducing potential leak paths. PurityPlus also offers a choice of valve options for gas flow control.
- Step Five** Select an assembly option from those available in the D column. A bare body regulator is shipped without peripherals, with all ports open and unplugged. A standard assembly regulator comes completely assembled with all selected peripherals, ready for use; a Cleanroom regulator is completely assembled in a Class 10 environment. Finally, each regulator must pass a battery of rigorous operational tests and a Helium Leak Integrity check.
- Step Six** Specify an inlet connection. On all regulator series, PurityPlus distributors will provide any CGA, DIN 477, BS 341, or other standard connection provided it is recognized as safe for the materials of construction and pressure rating of the regulator. Consult your nearest PurityPlus sales office for proper selection of the inlet connection. A "-000" at the end of the part number indicates no inlet connection (1/4" female NPT).
- Step Seven** Choose an installed option from a range of protocol stations and purges. By ordering these options as a component of the part number, PurityPlus can assure the appropriate materials, maximum pressure, and connections of the option chosen.

For example, using the table below to order a 422 Series regulator with an outlet pressure range of 0-50 PSIG, a 0-4000 PSIG inlet pressure gauge, a diaphragm valve with a 1/4" tube fitting, PSIG/kPa pressure gauges, and a CGA 580 connection for Nitrogen service, the part number would be 422-2331-580.

422	A		B	C	D	-Inlet	Options
<b>Series 422</b>	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly/Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-15*	30"-0-30 PSIG	0: None	0: 1/4" FPT Port	0: Bare Body	000: 1/4" FPT	A: Protocol Alarm Station (110V)
	2: 0-50	30"-0-100 PSIG	3: 0-4000 PSIG	1: 1/4" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: 1/8" Tube	B: Protocol Alarm Station (220V)
	3: 0-100	30"-0-200 PSIG	5: 0-1000 PSIG	2: 1/4" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: 1/4" Tube	C: Protocol Switchover Station
	4: 0-250	0-400 PSIG	6: 0-300 PSIG	3: Diaphragm Valve 1/4" Tube Fitting	4: Cleanroom Assembly (PSIG/kPa Gauges)	TF6: 3/8" Tube	D: Deep Purge
	5: 0-500	0-1000 PSIG	7: 0-400 PSIG	4: Diaphragm Valve 1/4" MPT	5: Cleanroom Assembly (BAR/PSIG Gauges)	M06: 6mm Tube	G: Protocol Switchover Station with Alarm (110V)
	7: 0-150	30"-0-200 PSIG	8: 0-6000 PSIG*	5: Needle Valve 1/4" MPT		CGA DIN 477 BS 341 and others available	H: Protocol Switchover Station with Alarm (220V)
	<i>*Not available with 4500 PSIG maximum inlet pressure</i>		<i>*Maximum inlet pressure 4500 PSIG (300 BAR) with PCTFE Seat Capsule</i>	6: 1/8" Tube Fitting			
				7: 3/8" Tube Fitting			
				8: Diaphragm Valve 1/8" Tube Fitting			
				9: Diaphragm Valve 1/4" FPT			
				A: 3/8" BSP Right Hand Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

## Recommended Regulator Chart

		200 series	300 series		400 series			Other	
Pure Gases			Brass	Plated Brass	Al3	Brass	SS	Brass	SS
Acetylene	Grade 2.6 (Purified)	x							
Air	Ultra Zero		x	x		x	x	x	x
	Zero	x	x	x	x	x	x	x	x
	Extra Dry	x	x	x	x	x	x	x	x
Ammonia	VLSI 4.5						x		
	Grade 2.5						x		
Argon	6.9 (Research)						x		x
	N2 Free 5.0		x			x	x	x	x
	Grade 5.0, (UHP)		x			x	x	x	x
	Grade 4.8 (Prepurified)	x	x			x	x	x	x
	Zero		x			x	x	x	x
	6000 PSI					x	x	x	x
Arsine	Electronic						x		
Boron Trichloride	Grade 5.0 (Research)								
	Grade 3.0 (Electronic)								
	Grade 2.5 (CP)								
Boron Trifluoride	Grade 2.5 (CP)						x		x
1,3-Butadiene	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
n-Butane	Grade 2.5 (Instrument)	x	x	x	x	x	x	x	x
	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
1-Butene	Grade 3.0 (Research)		x	x	x	x	x	x	x
	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
cis-2-Butene	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
	Grade 1.5 (Technical)	x	x	x	x	x	x	x	x
Carbon Dioxide	Grade 5.0 (Research)		x	x	x	x	x	x	x
	Grade 4.8 (Scientific)		x	x	x	x	x	x	x
	Laser 4.5		x	x	x	x	x	x	x
	Grade 4.0 (Instrument)	x	x	x	x	x	x	x	x
	Anerobic	x	x	x	x	x	x	x	x
	Grade 2.8 (Bone Dry)	x	x	x	x	x	x	x	x
Carbon Monoxide	Grade 4.0						x		x
	Grade 2.5 (CP)	x	x	x	x	x	x	x	x
	Grade 2.0 (Technical)	x	x	x	x	x	x	x	x
Carbonyl Sulfide	Grade 3.0						x		
Chlorine	Grade 3.0 (UHP)						x		x
	Grade 2.5 (High Purity)						x		x
Duterium	Grade 5.0		x	x		x	x	x	x
	Grade 4.0	x	x	x		x	x	x	x
	Grade 3.0	x	x	x		x	x	x	x
Dimethylether	Grade 2.8 (CP)	x	x	x	x	x	x	x	x
	Grade 2.5 (Technical)	x	x	x	x	x	x	x	x
Ethane	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
Ethylene	Grade 4.0	x	x	x	x	x	x	x	x
	Grade 3.0 (Polymer)	x	x	x	x	x	x	x	x
	Grade 2.5 (CP)	x	x	x	x	x	x	x	x
Helium	Grade 6.0 (Chromatographic)		x	x	x	x	x	x	x
	Grade 5.5		x	x	x	x	x	x	x
	Grade 5.0 (UHP)		x	x	x	x	x	x	x
	N2 Free 5.0		x	x	x	x	x	x	x
	Zero	x	x	x	x	x	x	x	x
	Grade 4.8 (Prepurified)	x	x	x	x	x	x	x	x
	6000 PSI					x	x	x	x
Hexafluoropropylene	Grade 3.0	x	x	x	x	x	x	x	x

## Recommended Regulator Chart

Pure Gases		200 series	300 series		400 series			Other	
			Brass	Plated Brass	Al3	Brass	SS	Brass	SS
Hydrogen	Grade 6.0 (Research)		x	x		x	x	x	x
	Grade 5.5		x	x		x	x	x	x
	Grade 5.0 (UHP)		x	x		x	x	x	x
	Zero	x	x	x		x	x	x	x
	Grade 4.0 (Prepurified) 6000 PSI	x	x	x		x	x	x	x
Hydrogen Bromide	Grade 2.8 (CP)						x		x
Hydrogen Chloride	Grade 5.0 (Research)						x		x
	Grade 4.5						x		x
	Grade 4.0						x		x
	Grade 2.0 (Technical)						x		x
Hydrogen Sulfide	Grade 2.5 (CP)				x		x		x
Isobutane	Grade 2.5 (Instrument)	x	x	x	x	x	x	x	x
	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
Krypton	Grade 5.0		x	x		x	x		x
	Grade 4.5		x	x		x	x		x
	Grade 2.0	x	x	x	x	x	x	x	x
Methane	Grade 5.0 (Research)		x	x		x	x	x	x
	Grade 4.0 (UHP)	x	x	x		x	x	x	x
	Grade 2.0 (CP)	x	x	x		x	x	x	x
	Grade 1.3 (Commercial)	x	x	x		x	x	x	x
Methyl Chloride	Grade 2.5 (CP)	x	x	x		x	x	x	x
Methyl Fluoride	Grade 2.0 (CP)	x	x	x		x	x	x	x
Methyl Mercaptan	Grade 2.5 (CP)						x		
Monomethylamine	Grade 2.5 (CP)						x		x
Neon	Grade 5.0 (UHP)		x	x		x	x	x	x
Neopentane	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
Nitric Oxide	Grade 3.0						x		x
	Grade 2.0 (CP)						x		x
Nitrogen	Grade 6.0 (Research)		x	x	x	x	x	x	x
	Grade 5.0 (UHP)		x	x	x	x	x	x	x
	Grade 4.8 (Prepurified)	x	x	x	x	x	x	x	x
	Zero	x	x	x	x	x	x	x	x
	Oxygen Free 4.8	x	x	x	x	x	x	x	x
	6000 PSI						x	x	x
Nitrogen Dioxide	Grade 2.5						x		x
Nitrogen Trifluoride	Grade 4.0	x	x	x		x	x	x	x
Nitrous Oxide	VLSI 5.0						x		x
	Grade 4.5		x	x	x	x	x	x	x
	Grade 3.0	x	x	x	x	x	x	x	x
	AA 2.6	x	x	x	x	x	x	x	x
Octafluoropropane	Grade 5.0		x	x	x	x	x	x	x
	Grade 3.0	x	x	x	x	x	x	x	x
Oxygen	Grade 5.0 (Research)		x	x		x		x	
	Grade 4.3 (UHP)		x	x		x		x	
	Zero	x	x	x		x		x	
	Grade 2.6 (Extra Dry)	x	x	x		x		x	
Phosphine	Electronic						x		
Propane	Grade 4.0 (Research)		x	x	x	x	x	x	x
	Grade 2.5 (Instrument)	x	x	x	x	x	x	x	x
	Grade 2.0 (CP)	x	x	x	x	x	x	x	x
Propylene	Grade 2.5 (Polymer)	x	x	x	x	x	x	x	x
	Grade 2.0 (CP)	x	x	x	x	x	x	x	x

## Recommended Regulator Chart

4

Pure Gases		200 series	300 series		400 series			Other	
			Brass	Plated Brass	Al3	Brass	SS	Brass	SS
Silane	VLSI CCD Semiconductor						x x x		x x x
Sulfur Dioxide	Grade 3.8 (Anhydrous)						x		x
Sulfur Hexafluoride	Grade 5.0 Grade 4.0 Grade 3.0	x	x x x	x x x	x x x	x x x	x x x	x x x	x x x
Tetrafluoromethane	Grade 5.0 Grade 4.0	x	x x	x x	x x	x x	x x	x x	x x
Trimethylamine	Grade 2.5 (CP)						x		x
Xenon	Grade 5.0 (research)		x	x	x	x	x	x	x
Mixtures			Brass	Plated Brass	Al3	Brass	SS	Brass	SS
Ammonia	in Helium in Hydrogen in Nitrogen						x x x		x x x
Argon	in Helium in Hydrogen in Nitrogen in Oxygen		x x x x	x x x x	x x x x	x x x x	x x x x	x x x x	x x x x
n-Butane	in Air in Helium in Nitrogen in Oxygen		x x x x	x x x x	x x x x	x x x x	x x x x	x x x x	x x x x
Carbon Dioxide	in Air in Argon in Helium in Hydrogen in Nitrogen in Oxygen		x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x
Carbon Monoxide	in Air in Nitrogen		x x	x x	x x	x x	x x	x x	x x
Ethane	in Air in Nitrogen		x x	x x	x x	x x	x x	x x	x x
Ethylene	in Air in Nitrogen		x x	x x	x x	x x	x x	x x	x x
Helium	in Argon in Nitrogen		x x	x x	x x	x x	x x	x x	x x
Hexane	in Air in Nitrogen		x x	x x	x x	x x	x x	x x	x x
Hydrogen	in Argon in Helium in Nitrogen		x x x	x x x	x x x	x x x	x x x	x x x	x x x
Hydrogen Sulfide	in Air in Nitrogen						x x		x x
Isobutane	in Air in Nitrogen		x x	x x	x x	x x	x x	x x	x x
Methane	in Argon in Helium in Hydrogen		x x x	x x x	x x x	x x x	x x x	x x x	x x x
Nitrogen Dioxide	in Air in Nitrogen						x x		x x
Nitrous Oxide	in Nitrogen		x	x	x	x	x	x	x
Nitric Oxide	in Argon						x		x

**Recommended Regulator Chart**

Mixtures		200 series	300 series		400 series			Other	
			Brass	Plated Brass	Al3	Brass	SS	Brass	SS
Oxygen	in Argon		x	x	x	x	x	x	x
	in Helium		x	x	x	x	x	x	x
	in Nitrogen		x	x	x	x	x	x	x
n-Pentane	in Air		x	x	x	x	x	x	x
	in Nitrogen		x	x	x	x	x	x	x
Propane	in Air		x	x	x	x	x	x	x
	in Nitrogen		x	x	x	x	x	x	x
Propylene	in Air		x	x	x	x	x	x	x
	in Nitrogen		x	x	x	x	x	x	x
Sulfur Dioxide	in Air						x		x
	in Nitrogen						x		x
Sulfur Hexafluoride	in Air		x	x	x	x	x	x	x



## 202 Series

single stage, brass body regulator

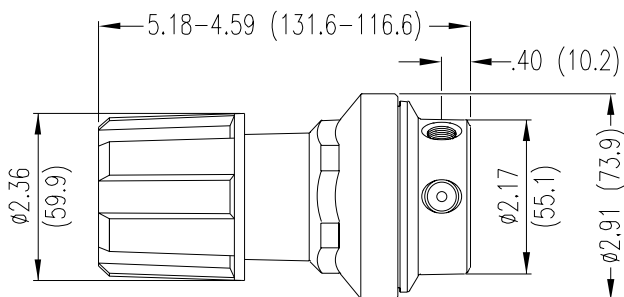
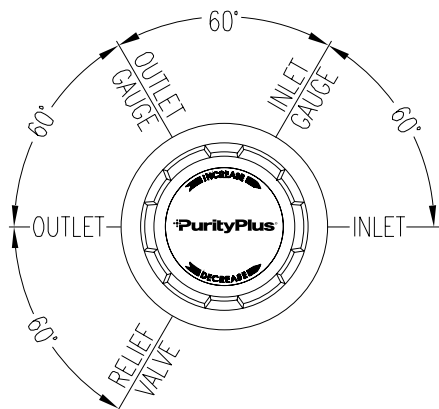


4

Description	Typical Applications
<p>The 202 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases (up to grade 4.5) in applications where minor fluctuations in outlet pressure due to diminishing inlet supply pressure can be tolerated.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Forged Brass Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Five Port Configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Gas supply purging</li> <li>• Gas system charging</li> <li>• Fuel gas supply control</li> <li>• Atomic absorption acetylene</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Forged Body</b> Durable, long-lasting construction</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Large Convoluted Diaphragm</b> Smooth pressure changes</p> <p><b>Standard Relief Valve</b> Diaphragm and gauge protection</p> <p><b>Chrome-plated Forged Brass Body</b> Economical high purity design</p> <p><b>High Flow Capacity</b> Supply multiple user locations</p> <p><b>Pressure Ranges 0-15 to 0-200 PSIG (0-1 to 0-34 BAR)</b> Broad range of applications</p>	<p><b>Body</b> Chrome-plated forged brass</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2½" diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.2</p> <p><b>Weight (202-1331-580)</b> 3.8 lbs. (1.74 kg)</p>

Installation Dimensions



4

Ordering Information

202	A		B	C	D	-CON	Options
<b>Series 202</b>	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/ 0-2 BAR	0: None	0: ¼" FPT Port	0: Bare Body	000: ¼" FPT	B: Protocol Alarm Station (110/220VAC)
	2: 0-40 PSIG (0-3 BAR)	0-60 PSIG 0-4 BAR	3: 0-4000 PSIG/ 0-275 BAR	1: ¼" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: ½" Tube	C: Protocol Switchover Station
	3: 0-120 PSIG (0-8 BAR)	0-200 PSIG 0-14 BAR	5: 0-1000 PSIG/ 0-70 BAR	2: ¼" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: ¼" Tube	H: Protocol Switchover Station with Alarm (110/220VAC)
	4: 0-200 PSIG (0-14 BAR)	0-400 PSIG 0-27 BAR	6: 0-400 PSIG/ 0-27 BAR	3: Diaphragm Valve ¼" Tube Fitting		TF6: ⅜" Tube	M: Protocol Station
	5: 0-15 PSIG (0-1 BAR)*	0-30 PSIG 0-2 BAR		5: Needle Valve ¼" MPT		CGA DIN 477 BS 341 and others available	T: Tee Purge
	<i>*With redline for acetylene use</i>			6: ⅛" Tube Fitting			
				7: ⅜" Tube Fitting			
				8: Diaphragm Valve ⅛" Tube Fitting			
				9: Diaphragm Valve ¼" FPT			
				A: ⅜" BSP RH Fitting			
				B: Diaphragm Valve ⅜" Tube Fitting			
				C: ⅜" BSP LH Fitting			
				D: 6 mm brass hose barb (Not available if A=4 or 5)			
				G: ⅛" Stainless Steel Tube Fitting			
				H: ¼" Stainless Steel Tube Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

## 203 Series

single stage, brass body regulator

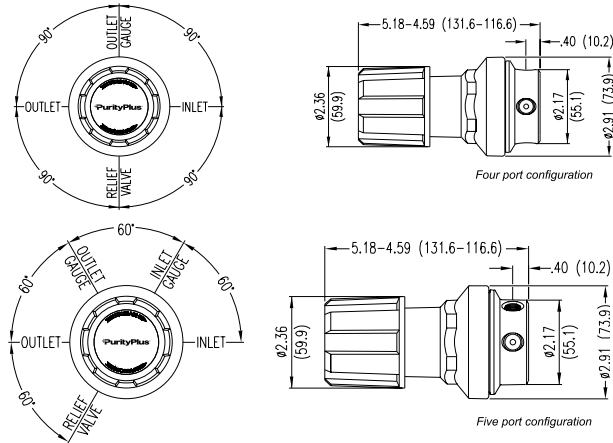


4

Description	Typical Applications
<p>The 203 Series regulators deliver non-corrosive, high purity or liquefied gases (up to grade 4.5) for applications requiring constant low pressure control from low inlet pressure sources below 200 PSIG. With delivery pressures as low as 0.1 PSIG (7 mBAR) that can be adjusted in 0.05 to 0.1 PSIG (4 to 7 mBAR) increments in two delivery pressure ranges, the 203 satisfies any high purity application requiring atmospheric pressures below 5 PSIG 9350 mBAR).</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Forged Brass Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Five Port Configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Low pressure inert blanketing of chemicals and fuel tanks</li> <li>• Gas supply purging</li> <li>• Gas system charging</li> <li>• Fuel gas supply control</li> <li>• Calibration gas control</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Forged Body</b> Durable, long-lasting construction</p> <p><b>Large Convoluted Diaphragm</b> Stable pressure control</p> <p><b>Standard Relief Valve</b> Diaphragm and gauge protection</p> <p><b>Chrome-plated Forged Brass Body</b> High purity design</p> <p><b>Substantial Flow Capacity at Low Outlet Pressure</b> Supply multiple user locations</p> <p><b>Pressure Ranges 0.05-2.0 to 0.1-5.0 PSIG</b> Excellent pressure control in 0.05 to 0.1 PSIG (4 to 7 mBAR) increments</p> <p><b>200 PSIG (14 BAR) Inlet Pressure Rating</b> Low inlet pressure gases or low line pressure inlet</p>	<p><b>Body</b> Chrome-plated forged brass</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 200 PSIG (14 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> <i>Inlet (optional):</i> 2 ½" (68mm) diameter chrome-plated brass <i>Outlet (optional):</i> 2 ½" (68mm) diameter steel case with brass connection</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.2</p> <p><b>Weight (0 2021-000)</b> 3.2 lbs. (1.44 kg)</p>

Installation Dimensions



Ordering Information

203	A		B	C	D	-CON
<b>Series 203</b>	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly Gauges</b>	<b>Inlet Connections</b>
	1: 0-2 PSIG (0-140 mBAR)	0-5 PSIG/ 0-350 mBAR	0: None	0: 1/4" FPT Port	0: Four port bare body	000: 1/4" FPT
	2: 0-5 PSIG (0-350 mBAR)	0-10 PSIG 0-700 mBAR	6: 0-400 PSIG/ 0-27 BAR	1: 1/4" MPT	1: Four port standard assembly (PSIG/kPa gauges)	TF2: 1/8" Tube
				2: 1/4" Tube Fitting	2: Four port standard assembly (BAR/PSIG Gauges)	TF4: 1/4" Tube
				3: Diaphragm Valve 1/4" Tube Fitting	A: Five port bare body	TF6: 3/8" Tube
				5: Needle Valve 1/4" MPT	B: Five port standard assembly (PSIG/kPa gauges)	M06: 6 mm Tube
				6: 1/8" Tube Fitting	C: Five port standard assembly (BAR/PSIG gauges)	CGA DIN 477 BS 341 and others available
				7: 3/8" Tube Fitting		
				8: Diaphragm Valve 1/8" Tube Fitting		
				9: Diaphragm Valve 1/4" FPT		
				A: 3/8" BSP RH Fitting		
				B: Diaphragm Valve 3/8" Tube Fitting		
				C: 3/8" BSP LH Fitting		
				D: 6 mm brass hose barb (Not available if A=4 or 5)		
				G: 1/8" Stainless Steel Tube Fitting		
				H: 1/4" Stainless Steel Tube Fitting		
				M: 6mm Tube Fitting		
				S: Diaphragm Valve 6mm Tube Fitting		

## 205 Series

single stage, brass body regulator

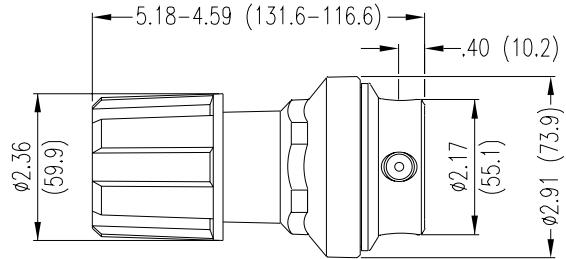
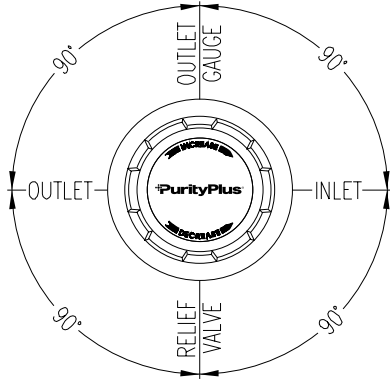


4

Description	Typical Applications
<p>The 205 Series regulators are intended for secondary pressure control of non-corrosive, high purity or liquefied gases (up to grade 4.5) or as point of use pressure control in high purity gas distribution systems.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Forged Brass Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Four Port Configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Point-of-use laboratory systems</li> <li>• Gas supply purging</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• Bulk gas distribution systems</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Forged Body</b> Durable, long-lasting construction</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Large Convoluted Diaphragm</b> Smooth pressure changes</p> <p><b>Standard Relief Valve</b> Diaphragm and gauge protection</p> <p><b>Chrome-plated Forged Brass Body</b> Economical high purity design</p> <p><b>High Flow Capacity</b> Supply multiple user locations</p> <p><b>Pressure Ranges 0-15 to 0-200 PSIG (0-1 to 0-14 BAR)</b> Broad range of applications</p> <p><b>3000 PSIG (210 BAR) Inlet Pressure Rating</b> Safe use with high pressure cylinders</p>	<p><b>Body</b> Chrome-plated forged brass</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2½" diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.28</p> <p><b>Weight (205-3021-000)</b> 3.2 lbs. (1.44 kg)</p>

Installation Dimensions



4

Ordering Information

205	A		B	C	D	-CON	Options
<b>Series</b> 205	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/ 0-2 BAR	0: None	0: 1/4" FPT Port	0: Bare Body	000: 1/4" FPT	<b>B:</b> Protocol Alarm Station (110/220VAC)
	2: 0-40 PSIG (0-3 BAR)	0-60 PSIG 0-4 BAR		1: 1/4" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: 1/8" Tube	<b>C:</b> Protocol Switchover Station
	3: 0-120 PSIG (0-8 BAR)	0-200 PSIG 0-14 BAR		2: 1/4" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: 1/4" Tube	<b>H:</b> Protocol Switchover Station with Alarm (110/220VAC)
	4: 0-200 PSIG (0-14 BAR)	0-400 PSIG 0-27 BAR		3: Diaphragm Valve 1/4" Tube Fitting		TF6: 3/8" Tube	<b>M:</b> Protocol Station
	5: 0-15 (0-1 BAR)*	0-30 PSIG 0-2 BAR		4: Diaphragm Valve 1/4" MPT			<b>T:</b> Tee Purge
	<i>*With redline for acetylene use</i>			5: Needle Valve 1/4" MPT			
				6: 1/8" Tube Fitting			
				7: 3/8" Tube Fitting			
				8: Diaphragm Valve 1/8" Tube Fitting			
				9: Diaphragm Valve 1/4" FPT			
				A: 3/8" BSP RH Fitting			
				B: Diaphragm Valve 3/8" Tube Fitting			
				C: 3/8" BSP LH Fitting			
				D: 6 mm brass hose barb (Not available if A=4 or 5)			
				G: 1/8" Stainless Steel Tube Fitting			
				H: 1/4" Stainless Steel Tube Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

## 206 Series

single stage, brass body regulator

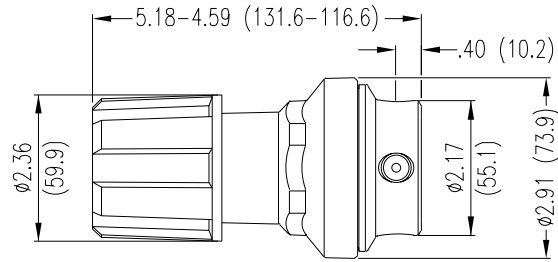
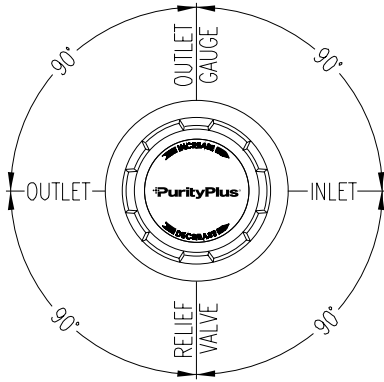
4



Description	Typical Applications
<p>The 206 Series regulators are intended for primary pressure control of gases supplied from cryogenic liquid cylinders.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Forged Brass Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Liquid Cylinder Regulator</li> <li>• Four Port Configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Argon</li> <li>• Nitrogen</li> <li>• Oxygen</li> <li>• Carbon dioxide</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Forged Body</b> Durable, long-lasting construction</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Large Convoluted Diaphragm</b> Smooth pressure changes</p> <p><b>Standard Relief Valve</b> Diaphragm and gauge protection</p> <p><b>Designed for Low Inlet Pressures</b> Optimized flow with liquid cylinders</p> <p><b>Large Capsule® Seat</b> Permits flow rates unobtainable with conventional regulators</p> <p><b>3000 PSIG (210 BAR) Inlet Pressure Rating</b> Safe use on high pressure cylinders</p>	<p><b>Body</b> Chrome-plated forged brass</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2½" diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.28</p> <p><b>Weight (206-3021-580)</b> 3.5 lbs. (1.59 kg)</p>

Installation Dimensions



4

Ordering Information

206	A		B	C	D	-CON	Options
<b>Series 206</b>	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/ 0-2 BAR	0: None	0: 1/4" FPT Port	0: Bare Body	000: 1/4" FPT	B: Protocol Alarm Station (110/220VAC)
	2: 0-40 PSIG (0-3 BAR)	0-60 PSIG 0-4 BAR		1: 1/4" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: 1/8" Tube	C: Protocol Switchover Station
	3: 0-120 PSIG (0-8 BAR)	0-200 PSIG 0-14 BAR		2: 1/4" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: 1/4" Tube	H: Protocol Switchover Station with Alarm (110/220VAC)
	4: 0-200 PSIG (0-14 BAR)	0-400 PSIG 0-27 BAR		3: Diaphragm Valve 1/4" Tube Fitting		TF6: 3/8" Tube	M: Protocol Station
				4: Diaphragm Valve 1/4" MPT		M06: 6m tube	Q: Protocol Purge Station
				5: Needle Valve 1/4" MPT		CGA	
				6: 1/8" Tube Fitting		DIN 477	
				7: 3/8" Tube Fitting		BS 341	
				8: Diaphragm Valve 1/8" Tube Fitting		and others available	
				9: Diaphragm Valve 1/4" FPT			
				A: 3/8" BSP RH Fitting			
				B: Diaphragm Valve 3/8" Tube Fitting			
				C: 3/8" BSP LH Fitting			
				D: 6 mm brass hose barb			
				G: 1/8" Stainless Steel Tube Fitting			
				H: 1/4" Stainless Steel Tube Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			



## 212 Series

dual stage, brass body regulator

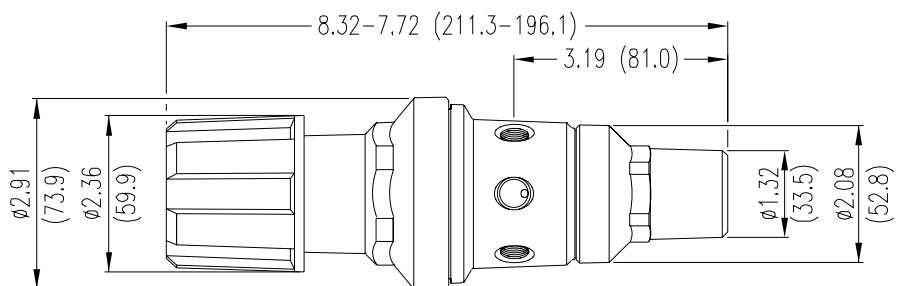
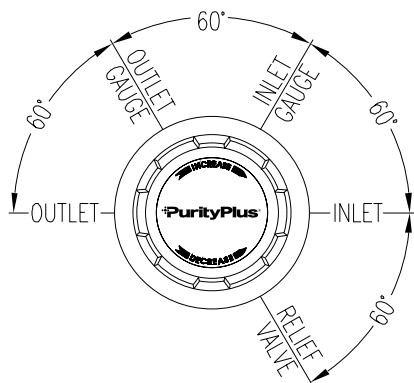


4

Description	Typical Applications
<p>The 212 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases (up to grade 4.5) for applications requiring constant pressure control and delivery regardless of supply pressure variations.</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• Chrome-Plated Forged Brass Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Five Port Configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Argon</li> <li>• Nitrogen</li> <li>• Oxygen</li> <li>• Carbon Dioxide</li> <li>• Hydrogen</li> <li>• Non corrosive mixtures</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Forged Body</b> Durable, long-lasting construction</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Large Convuluted Diaphragm</b> Smooth pressure changes</p> <p><b>Standard Relief Valve</b> Diaphragm and gauge protection</p> <p><b>Chrome-Plated Forged Brass Body</b> Economical high purity design</p> <p><b>High Flow Capacity</b> Supply multiple user locations</p> <p><b>Pressure Ranges 0-15 to 0-200 PSIG (0-1 to 0-14 BAR)</b> Broad range of applications</p>	<p><b>Body</b> Chrome-plated forged brass</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PCTFE (first stage) PTFE (second stage)</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR) 3500 PSIG (240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2½" diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.28</p> <p><b>Weight (212-3331-580)</b> 5.1 lbs. (2.3 kg)</p>

**Installation Dimensions**



4

**Ordering Information**

212	A		B	C	D	-CON	Options
Series 212	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/ Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/ 0-2 BAR	0: None	0: 1/4" FPT Port	0: Bare Body	000: 1/4" FPT	B: Protocol Alarm Station (110/220V)
	2: 0-40 PSIG (0-3 BAR)	0-60 PSIG/ 0-4 BAR	3: 0-4000 PSIG/0-275 BAR	1: 1/4" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: 1/8" Tube	C: Protocol Switchover Station
	3: 0-120 PSIG (0-8 BAR)	0-200 PSIG/0-14 BAR	5: 0-1000 PSIG/0-70 BAR	2: 1/4" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: 1/4" Tube	H: Protocol Switchover Station with Alarm (110/220V)
	4: 0-200 PSIG (0-14 BAR)	0-400 PSIG/0-27 BAR	6: 0-400 PSIG/0-27 BAR	3: Diaphragm Valve 1/4" Tube Fitting		TF6: 3/8" Tube	M: Protocol Station
	5: 0-15 PSIG (0-1 BAR)*	0-30 PSIG/0-2 BAR with redline for acetylene use	8: 0-6000 PSIG/0-415 BAR*	4: Diaphragm Valve 1/4" MPT		M06: 6mm Tube	Q: Protocol Purge Station
			9: 0-600 PSIG/0-42 BAR	5: Needle Valve 1/4" MPT		CGA	T: Tee Purge
			G: 0-4000 PSIG/0-275 BAR†	6: 1/8" Tube Fitting		DIN 477	
				7: 3/8" Tube Fitting		BS 341 and others available	
				8: Diaphragm Valve 1/8" Tube Fitting			
				9: Diaphragm Valve 1/4" FPT			
				A: 3/8" BSP Right Hand Fitting			
				B: Diaphragm Valve 3/8" Tube Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			
	*Not available with 4500 PSIG (310 BAR) Max Inlet		*Max inlet 4500 PSIG (310 BAR) with PCTFE Seat Capsule®				
			†Max inlet pressure 3500 (240 BAR) with PCTFE seat Capsule				

## 213 Series

dual stage, chrome-plated forged brass body regulator

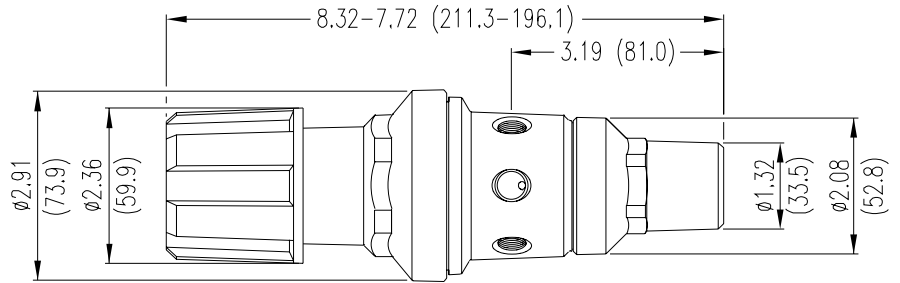
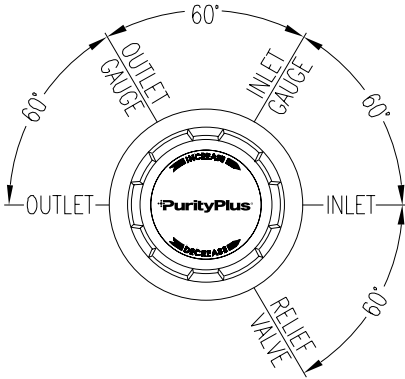


4

Description	Typical Applications
<p>The 213 Series regulators deliver non-corrosive, high purity or liquefied gases (up to grad 4.5) for applications requiring constant low pressure control and delivery regardless of supply pressure variations. With delivery pressures as low as 0.1 PSIG (7 mBAR) that can be adjusted in 0.05 to 0.1 PSIG (4 to 7 mBAR) increments in two delivery pressure ranges, the 213 satisfies any high purity application requiring atmospheric pressures below 5 PSIG (350 mBAR).</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• Chrome-Plated Forged Brass Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Five Port Configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Low pressure inert blanketing of chemicals and fuel tanks</li> <li>• Gas supply purging</li> <li>• Gas system charging</li> <li>• Fuel gas supply control</li> <li>• Calibration gas control</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Forged Body</b> Durable, long-lasting construction</p> <p><b>Large Convoluted Diaphragm</b> Stable pressure control</p> <p><b>Standard Relief Valve</b> Diaphragm and gauge protection</p> <p><b>Chrome-Plated Forged Brass Body</b> High purity design</p> <p><b>Substantial Flow Capacity at Low Outlet Pressure</b> Supply multiple user locations</p> <p><b>Pressure Ranges 0.05-2.0 to 0.1-5.0 PSIG (4-140 mBAR to 7-350 mBAR)</b> Excellent pressure control in 0.05 to 0.1 PSIG (4 to 7 mBAR) increments</p> <p><b>3000 and 4500 PSIG (210 and 415 BAR) Inlet Pressure Rating</b> Safe use with high pressure cylinders</p>	<p><b>Body</b> Chrome-plated forged brass</p> <p><b>Bonnet</b> Chrome-plated die-cast zinc</p> <p><b>Seat</b> PCTFE (first stage) PTFE (second stage)</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> <b>Inlet:</b> 2½" (68mm) diameter chrome-plated brass <b>Outlet:</b> 2½" (68mm) diameter steel case with brass connection</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.02</p> <p><b>Weight (213 1331-580)</b> 5.1 lbs. (2.3 kg)</p>

Installation Dimensions



4

Ordering Information

213	A		B	C	D	-CON	Options
<b>Series</b> 213	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly/ Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-2 PSIG (0-140 mBAR)	0-5 PSIG/ (0-350 mBAR)	0: None	0: 1/4" FPT Port	0: Bare Body	000: 1/4" FPT	B: Protocol Alarm Station (110/220V)
	2: 0-5 PSIG (0-350 mBAR)	0-10 PSIG/ (0-700 mBAR)	3: 0-4000 PSIG/0-275 BAR	1: 1/4" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: 1/8" Tube	C: Protocol Switchover Station
			5: 0-1000 PSIG/0-70 BAR	2: 1/4" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: 1/4" Tube	H: Protocol Switchover Station with Alarm (110/220V)
			6: 0-400 PSIG/0-27 BAR	3: Diaphragm Valve 1/4" Tube Fitting		TF6: 3/8" Tube	M: Protocol Station
			9: 0-600 PSIG/0-42 BAR	5: Needle Valve 1/4" MPT		CGA DIN 477 BS 341 and others available	Q: Protocol Purge Station
				6: 1/8" Tube Fitting			T: Tee Purge
				7: 3/8" Tube Fitting			
				8: Diaphragm Valve 1/8" Tube Fitting			
				9: Diaphragm Valve 1/4" FPT			
				A: 3/8" BSP Right Hand Fitting			
				B: Diaphragm Valve 3/8" Tube Fitting			
				C: 3/8" BSP LG Fitting			
				D: 6mm Brass Hose Barb			
				G: 1/8" Stainless Steel Tube Fitting			
				H: 1/4" Stainless Steel Tube Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

## 302 Series

single stage, chrome-plated brass barstock regulator

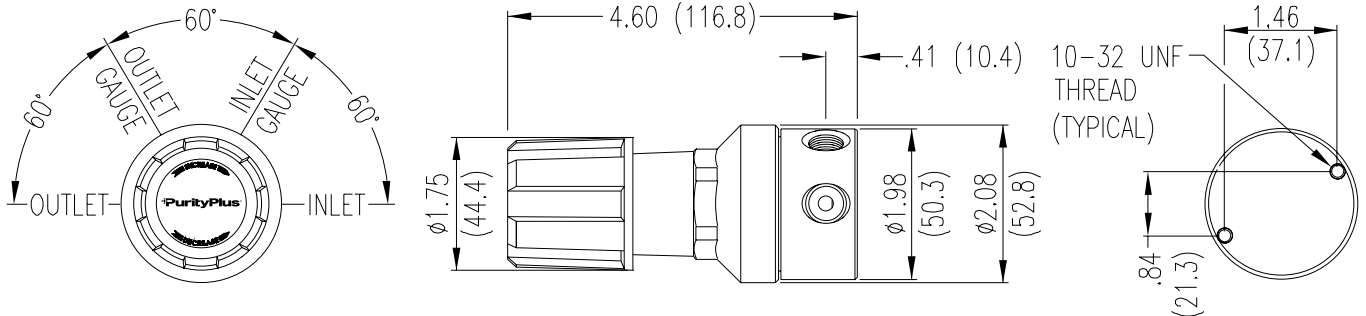


4

Description	Typical Applications
<p>The 302 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases or for applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Brass Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Low Wetted Surface Area</b> Minimal purge requirements</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Convolute Diaphragm</b> Smooth pressure changes</p> <p><b>Compact Design</b> Easily transported and integrated into systems</p> <p><b>Chrome-Plated Brass Barstock Body</b> Smooth surface finish</p> <p><b>Rear Panel-Mountable</b> Easy installation</p> <p><b>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</b> Broad range of applications</p>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die-cast zinc</p> <p><b>Seat</b> PTFE PCTFE with 3500 PSIG (240 BAR) or 4500 PSIG (310 BAR) inlet option</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR) 3500 PSIG (240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2" (53mm) diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.1</p> <p><b>Weight (302 2331-580)</b> 3.1 lbs. (1.40 kg)</p>

**Installation Dimensions**



4

**Ordering Information**

302	A		B	C	D	-CON	Options
Series 302	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/ Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG (0-1 BAR)*	30"-0-30 PSIG /-1-0-2 BAR	0: None	0: ¼" FPT Port	0: Bare Body	000: ¼" FPT	B: Protocol Alarm Station (110/220V)
	2: 0-50 PSIG (0-3.5 BAR)	30"-0-100 PSIG /-1-0-7 BAR	3: 0-4000 PSIG /0-275 BAR	1: ¼" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: ½" Tube	C: Protocol Switchover Station
	3: 0-100 PSIG (0-7 BAR)	30"-0-200 PSIG /-1-0-14 BAR	5: 0-1000 PSIG /0-70 BAR	2: ¼" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: ¼" Tube	H: Protocol Switchover Station with Alarm (110/220V)
	4: 0-250 PSIG (0-17 BAR)	0-400 PSIG /0-27 BAR	6: 0-300 PSIG /0-21 BAR	3: Diaphragm Valve ¼" Tube Fitting		TF6: ⅜" Tube	M: Protocol Station
	5: 0-500 PSIG (0-34 BAR)	0-1000 PSIG /0-70 BAR	7: 0-400 PSIG /0-27 BAR	4: Diaphragm Valve ¼" MPT		M06: 6mm tube	Q: Protocol Purge Station*
	7: 0-150 PSIG (0-10 BAR)	30"-0-200 PSIG /-1-0-14 BAR	8: 0-6000 PSIG/ 0-415 BAR*	5: Needle Valve ¼" MPT		CGA DIN 477 BS 341 and others available	T: Tee Purge*
	*Not available with 4500 PSIG (310 BAR) maximum inlet pressure		G: 0-4000 PSIG /0-275 BAR†	6: ⅜" Tube Fitting			*Not available with 4500 PSIG (310 BAR) max inlet pressure
		*Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE Seat CAPSULE®		7: ⅜" Tube Fitting			
		†Maximum inlet pressure 3500 PSIG (240 BAR) with PCTFE seat CAPSULE®		8: Diaphragm Valve ⅜" FPT			
				9: Diaphragm Valve ¼" FPT			
				A: ⅜" BSP RH Fitting			
				B: Diaphragm valve ⅜" tube Fitting			
				C: ⅜" BSP LH Fitting			
				D: 6mm Brass Hose Barb (not available if A=4 or 5)			
				G: ⅜" Stainless Steel Tube Fitting			
				H: ¼" Stainless Steel Tube Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

## 305 Series

single stage, chrome-plated brass barstock regulator

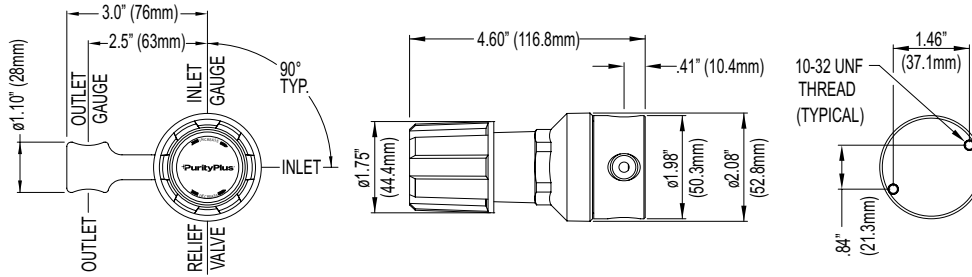


4

Description	Typical Applications
<p>The 305 Series regulators are specifically designed for use in the medical laboratory for blood gases, laser gases, and other clinical gas applications where minor fluctuations in outlet pressure due to diminishing inlet supply pressure can be tolerated.</p> <p>Custom Calibration In addition to a standard 2-15 LPM flowgauge for Carbon Dioxide in laser applications, CONCOA also offers a custom 2-15 LPM calibration for any non-corrosive gas or mixture. The outlet orifice is sized to the flow requirement for a specific gas using a thermal mass flowmeter.</p>	<ul style="list-style-type: none"> <li>• Blood gases</li> <li>• Laser gases</li> <li>• Medical research</li> <li>• Pharmaceutical manufacturing</li> <li>• University laboratories</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Low Wetted Surface Area</b> Minimal purge requirements</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Convolute Diaphragm</b> Smooth pressure changes</p> <p><b>Compact Design</b> Easily transported and integrated into systems</p>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2" (53 mm) diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.1</p> <p><b>Weight (305 8381-M2D)</b> 2.8 lbs. (1.29 kg)</p>

**Installation Dimensions**



4

**Ordering Information**

305	A		B	C	D	-CON	Options
<b>Series</b> 305	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly/ Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-15 PSIG 2: 0-30 PSIG 3: 0-50 PSIG 5: 0-100 PSIG 6: 0-200 PSIG 7: 0-500 PSIG 8: 2-15 LPM CO <sub>2</sub> 9: Custom Calibration	0-30 PSIG 0-60 PSIG 0-100 PSIG 0-200 PSIG 0-400 PSIG 0-1000 PSIG 2-15 LPM flowgauge Custom flowgauge	0: None 3: 0-4000 PSIG	0: ¼" FPT Port 1: ¼" MPT 2: ¼" Tube Fitting 3: Diaphragm Valve ¼" Tube Fitting 4: Diaphragm Valve ¼" MPT 5: Needle Valve ¼" MPT 6: ⅛" Tube Fitting 7: ⅜" Tube Fitting 8: Medical DISS outlet 9: ¼" hose barb A: ⅜" BSP RH Fitting	0: Bare Body 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges)	See Inlet/Outlet selection chart below  (Availability is limited to the combinations shown)	<b>B:</b> Protocol alarm station (110/220 VAC) <b>C:</b> Protocol switchover station <b>H:</b> Protocol switchover station with alarm (110/220 VAC) <b>M:</b> Protocol station <b>Q:</b> Protocol purge station

Gas Service	Inlet (CGA)		Outlet (Medical DISS)			
	Threaded	Yoke	Primary	Diss Part No.	Optional	DISS Part No.
Air	CGA 346	CGA 950	1160	830 5686	N/A	
Argon, Neon, Krypton, Xenon	CGA 580	CGA 985	N/A		N/A	
Carbon Dioxide	CGA 320	CGA 940	1080	830 6042	N/A	
Carbon Dioxide < 7% and Oxygen	CGA 280	CGA 880	1200	830 6043	1020	830 6047
Carbon Dioxide > 7% and Oxygen	CGA 500	CGA 940	1080	830 6042	1020	830 6047
Clinical Blood Gas Mixtures	CGA 500	CGA 973	1020	830 6046	1080	830 6042
Ethylene	CGA 350	CGA 900	1140	830 6049	N/A	
Helium	CGA 580	CGA 930	1060	830 6048	N/A	
Helium < 80% and Oxygen	CGA 280	CGA 890	1180	830 6045	1020	830 6047
Helium > 80% and Oxygen	CGA 500	CGA 930	1060	830 6048	1020	830 6047
Nitrogen	CGA 580	CGA 960	1120	830 6044	N/A	
Nitrogen and Oxygen > 23.5%	CGA 280	CGA 890	2040		N/A	
Nitrous Oxide	CGA 326	CGA 910	1040	830 4264	N/A	
Nitrous Oxide 47.5% - 52.5% and Oxygen	CGA 280	CGA 965	2020	830 6046	N/A	
Oxygen	CGA 540	CGA 870	1240	803 0051	N/A	
Xenon and Oxygen > 20%	CGA 280	CGA 890	1020	830 6047	1180	
Non-flammable, noncorrosive gas mixtures labeled as drugs or medical devices without another connection assignment	CGA 500	CGA 973	1020	830 6047	N/A	



## 312 Series

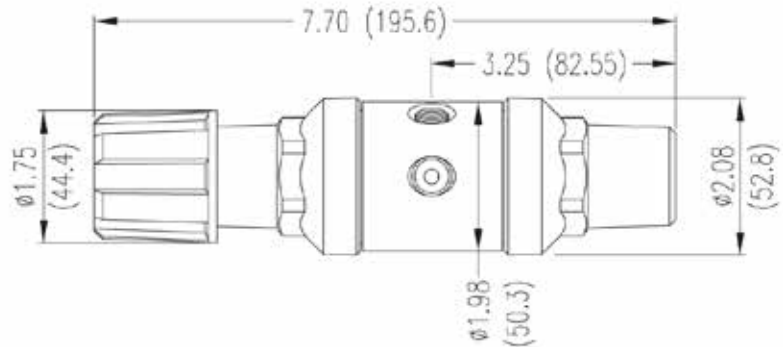
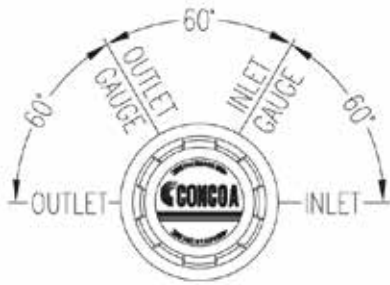
high purity, two stage, brass barstock regulator



Description	Typical Applications
<p>The 312 Series regulators are intended for primary pressure control of noncorrosive, high purity or liquefied gases for applications requiring constant pressure control and delivery regardless of supply pressure variations.</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• Chrome-Plated Brass Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• EPA Protocol gases</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Low Wetted Surface Area</b> Minimal purge requirements</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Convuluted Diaphragm</b> Smooth pressure changes</p> <p><b>Compact Design</b> Easily transported and integrated into systems</p> <p><b>Chrome-Plated Brass Barstock Body</b> Smooth surface finish</p> <p><b>10 Micron Filtration in Both Stages</b> Fail-safe seat performance</p> <p><b>Pressure Ranges 0-15 to 0-250 PSIG (0-1 to 0-17 BAR)</b> Broad range of applications</p>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PCTFE (first stage) PTFE (second stage)</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR) 3500 PSIG (240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2" (53mm) diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.1</p> <p><b>Weight (312-2331-580)</b> 4.4 lbs. (1.98 kg)</p>

Installation Dimensions



4

Ordering Information

312	A	B	C	D	-CON	Options	
<b>Series</b> 312	<b>Outlet Pressure</b> 1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 7: 0-150 PSIG	<b>Outlet Gauge</b> 30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 30"-0-200 PSIG	<b>Inlet Gauge</b> 0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-6000 PSIG* G: 0-4000 PSIG†  *Maximum inlet pressure 4500 PSIG with PCTFE Seat CAPSULE®  †Maximum inlet pressure 3500 PSIG with PCTFE seat CAPSULE	<b>Outlet Assemblies</b> 0: 1/4" FPT Port 1: 1/4" MPT 2: 1/4" Tube Fitting 3: Diaphragm Valve 1/4" Tube Fitting 4: Diaphragm Valve 1/4" MPT 5: Needle Valve 1/4" MPT 6: 1/8" Tube Fitting 7: 3/8" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting 9: Diaphragm Valve 1/4" FPT A: 3/8" BSP Right Hand Fitting B: Diaphragm valve 3/8" tube fitting C: 3/8" BSP Left Hand Fitting D: 6mm brass hoss barb (not available if A=4 or 5) G: 1/8" stainless steel tube fitting H: 1/4" stainless steel tube fitting M: 6mm Tube Fitting S: Diaphragm Valve 6mm Tube Fitting	<b>Assembly/ Gauges</b> 0: Bare Body 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges)	<b>Inlet Connections</b> 000: 1/4" FPT TF2: 1/8" Tube TF4: 1/4" Tube TF6: 3/8" Tube M06: 6mm tube  CGA DIN 477 BS 341 and others available	<b>Installed Options</b> B: Protocol Alarm Station (110/220V) C: Protocol Switchover Station H: Protocol Switchover Station with Alarm (110/220V) M: Protocol Station Q: Protocol Purge Station* T: Tee Purge*  <i>*Not available with 4500 PSIG max inlet pressure</i>

## 315 Series

dual stage, chrome-plated brass barstock regulator

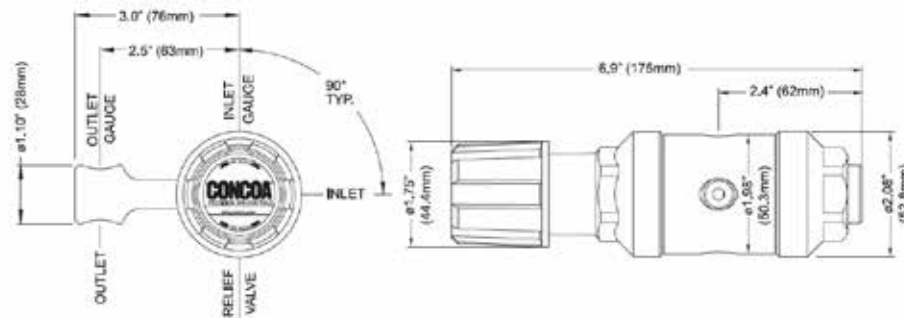


4

Description	Typical Applications
<p>The 315 Series regulators are specifically designed for use in the medical laboratory for blood gases, laser gases, and other clinical gas applications requiring constant pressure control and delivery regardless of supply pressure variations.</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• Chrome-plated brass barstock body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Custom Calibration</li> </ul>	<ul style="list-style-type: none"> <li>• Blood gases</li> <li>• Laser gases</li> <li>• Medical research</li> <li>• Pharmaceutical manufacturing</li> <li>• University laboratories</li> </ul>

Features	Materials	Specifications
<p><b>CAPSULE® Seat</b> Increased serviceability and life</p> <p><b>316L Stainless Steel Diaphragm</b> No inboard diffusion</p> <p><b>Low Wetted Surface Area</b> Minimal purge requirements</p> <p><b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</p> <p><b>Convuluted Diaphragm</b> Smooth pressure changes</p> <p><b>Compact Design</b> Easily transported and integrated into systems</p>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE (first stage) PTFE (second stage)</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2" (53mm) diameter chrome-plated brass</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.1</p> <p><b>Weight (315-5301-580)</b> 4.2 lbs. (1.90 kg)</p>

Installation Dimensions



Ordering Information

315	A		B	C	D	-CON	Options
Series	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/ Gauges	Connections	Installed Options
315	<b>1:</b> 0-15 PSIG <b>2:</b> 0-30 PSIG <b>3:</b> 0-50 PSIG <b>5:</b> 0-100 PSIG <b>6:</b> 0-200 PSIG <b>8:</b> 2-15 LPM CO <sub>2</sub> <b>9:</b> Custom Calibration	<b>0-30 PSIG</b> <b>0-60 PSIG</b> <b>0-100 PSIG</b> <b>0-200 PSIG</b> <b>0-400 PSIG</b> <b>2-15 LPM</b> Flowgauge <b>Custom</b> Flowgauge	<b>0:</b> None <b>3:</b> 0-4000 PSIG	<b>0:</b> ¼" FPT Port <b>1:</b> ¼" MPT <b>2:</b> ¼" Tube Fitting <b>3:</b> Diaphragm Valve ¼" Tube Fitting <b>4:</b> Diaphragm Valve ¼" MPT <b>5:</b> Needle Valve ¼" MPT <b>6:</b> ½" Tube Fitting <b>7:</b> ¾" Tube Fitting <b>8:</b> Medical DISS outlet <b>9:</b> ¼" hose barb <b>A:</b> ¾" BSP Right Hand Fitting	<b>0:</b> Bare Body <b>1:</b> Standard Assembly (PSIG/kPa Gauges) <b>2:</b> Standard Assembly (BAR/PSIG Gauges)	See Inlet/Outlet selection chart below for limited CGA connections.  DIN 477, BS 341 and others available	<b>B:</b> Protocol Alarm Station (110/220V) <b>C:</b> Protocol Switchover Station <b>H:</b> Protocol Switchover Station with Alarm (110/220V) <b>M:</b> Protocol Station <b>Q:</b> Protocol Purge Station

Gas Service	Inlet		Primary	Outlet (Medical DISS)		
	(Threaded)	(Yoke)		DISS Part No.	Optional	DISS Part No.
Air	CGA 346	CGA 950	1160	830 5686	N/A	
Argon, Neon, Krypton, Xenon	CGA 580	CGA 985	N/A		N/A	
Carbon Dioxide	CGA 320	CGA 940	1080	830 6042	N/A	
Carbon Dioxide < 7% and Oxygen	CGA 280	CGA 880	1200	830 6043	1020	830 6047
Carbon Dioxide > 7% and Oxygen	CGA 500	CGA 940	1080	830 6042	1020	830 6047
Clinical Blood Gas Mixtures	CGA 500	CGA 973	1020	830 6046	1080	830 6042
Ethylene	CGA 350	CGA 900	1140	830 6049	N/A	
Helium	CGA 580	CGA 930	1060	830 6048	N/A	
Helium < 80% and Oxygen	CGA 280	CGA 890	1180	830 6045	1020	830 6047
Helium > 80% and Oxygen	CGA 500	CGA 930	1060	830 6048	1020	830 6047
Nitrogen	CGA 580	CGA 960	1120	830 6044	N/A	
Nitrogen and Oxygen > 23.5%	CGA 280	CGA 890	2040		N/A	
Nitrous Oxide	CGA 326	CGA 910	1040	830 4264	N/A	
Nitrous Oxide 47.5% - 52.5% and Oxygen	CGA 280	CGA 965	2020	830 6046	N/A	
Oxygen	CGA 540	CGA 870	1240	830 0051	N/A	
Xenon and Oxygen < 20%	CGA 280	CGA 890	1020	830 6047	1180	
Non-flammable, noncorrosive gas mixtures labeled as drugs or medical devices without another connection assignment	CGA 500	CGA 973	1020	830 6047	N/A	

## 420 Series

single stage regulator



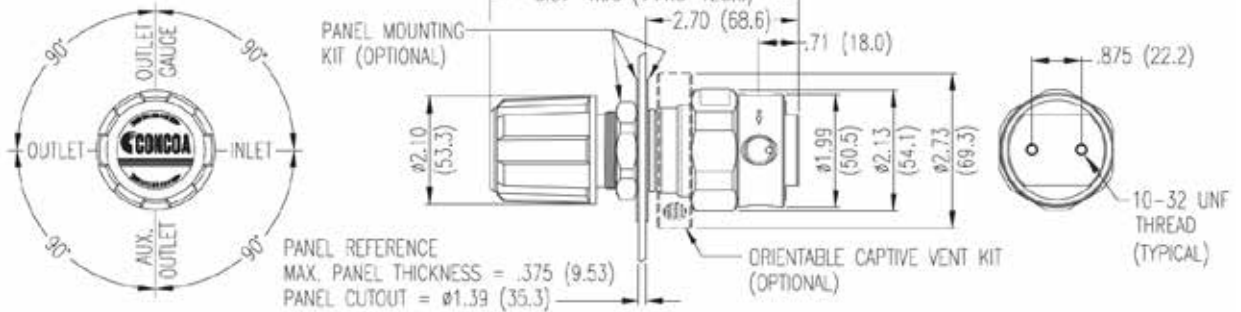
4

Description	Typical Applications
<p>The 420 Series SilcoNert™ regulators are intended for primary pressure control of reactive or corrosive calibration mixtures or pure gases in applications where an extremely inert wetted finish is required. The proprietary non-reactive amorphous silicon finish is significantly more inert than 316L stainless steel and ideally suited for Hydrogen Sulfide, reduced Sulfur, Mercury and PPM to PPB calibration mixtures.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• SilcoNert™ 1020 Coated Body, Diaphragm, and Internals</li> <li>• Six Port Configuration or Four Port Configuration</li> <li>• Inert Surface Finish and Corrosion Resistance</li> </ul>	<ul style="list-style-type: none"> <li>• Reactive calibration standard</li> <li>• Emissions monitoring</li> <li>• Hydrogen Sulfide PPM to PPB standards</li> <li>• Mercury standards</li> <li>• Sulfur mixtures</li> <li>• Corrosive service</li> </ul>

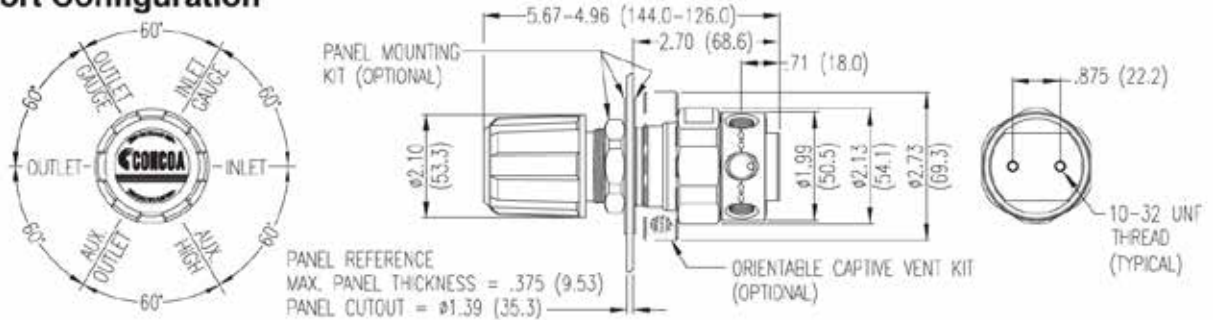
Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® Seat</i> Increased serviceability and life</li> <li>• <i>SilcoNert 1020 Barstock Body</i> Increased corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG</i> Broad range of applications</li> </ul>	<p><i>Body</i> SilcoNert 1020</p> <p><i>Bonnet</i> SilcoNert 1020</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> SilcoNert 1020 10 micron mesh</p> <p><i>Diaphragm</i> SilcoNert 1020</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauge</i> 2" (53mm) diameter stainless steel (bourdon tube not SilcoNert 1020)</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1 (Max outlet 50 PSIG or below) 0.2 (Max outlet above 50 PSIG)</p> <p><i>Weight (445 3331-330)</i> 3.8 lbs. (1.73 kg)</p>

Installation Dimensions

**Four Port Configuration**



**Six Port Configuration**



Ordering Information and Configuration Options

420	A	B	C	D	-Inlet	Options	
<b>Series</b> 420	<b>Outlet Pressure</b> 1: 0-15 PSIG* 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG 7: 0-150 PSIG  *Not available with 4500 PSIG (310 BAR) maximum inlet pressure	<b>Outlet Gauge</b> 30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 30"-0-400 PSIG 30"-0-1000 PSIG 30"-0-200 PSIG	<b>Inlet Gauge</b> 0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-6000 PSIG* *Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE Seat CAPSULE®	<b>Outlet Assemblies</b> 0: ¼" FPT Port 2: ¼" Tube Fitting 3: Diaphragm Valve ¼" Tube Fitting 6: ½" Tube Fitting 8: Diaphragm valve ½" tube fitting 9: Diaphragm valve ¼" FPT M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting	<b>Assembly/ Gauges</b> 0: Six-port bare body 1: Six-port cleanroom assembly (PSIG/kPa Gauges) 2: Six-port cleanroom assembly (BAR/PSIG Gauges) 6: Six-port mirror image (PSIG/kPa gauges) 7: Six-port mirror image (BAR/PSIG gauges) A: Four-port bare body B: Four-port cleanroom assembly (PSIG/kPa gauges) C: Four-port cleanroom assembly (BAR/PSIG) D: Four-port mirror image (PSIG/kPa gauges) E: Four-port mirror image (BAR/PSIG gauges)	<b>Connections</b> 000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube M06: 6mm tube CGA DIN 477 BS 341 and others available upon request	<b>Installed Options</b> B: Protocol Alarm Station (110/220V) C: Protocol Switchover Station* H: Protocol Switchover Station with Alarm (110/220V)* M: Protocol Station Q: Protocol Purge Station*  *Not available with 4500 PSIG (310 BAR) max inlet pressure

## 422 Series

high purity, single stage, stainless steel barstock regulator

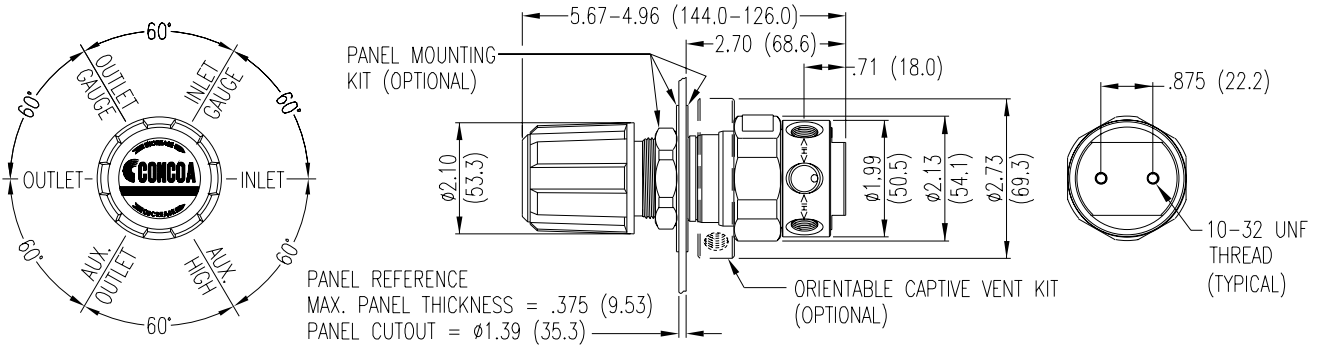


4

Description	Typical Applications
<p>The 422 Series regulators are intended for primary pressure control of ultra-high purity and corrosive gases in applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Six Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Gas and liquid chromatography</li> <li>• Ultra high purity carrier gases</li> <li>• Zero, span and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• Corrosive gases</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>316L stainless steel diaphragm</i> Increased corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> <li>• <i>Pipe away relief valve</i> Safely vent exhaust gases</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE PCTFE with 3500 PSIG (240 BAR) or 4500 PSIG (310 BAR) inlet</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 3500 PSIG (240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (422-3331-580)</i> 3.8 lbs. (1.73 kg)</p>

Installation Dimensions



Ordering Information and Configuration Options

422	A		B	C	D	-Inlet	Options
<b>Series</b> 42	<b>Outlet Pressure</b> 1: 0-15 PSIG* 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG** 7: 0-150 PSIG  *Not available with 4500 PSIG (310 BAR) maximum inlet pressure  **Standard assembly does not include relief valve	<b>Outlet Gauge</b> 30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG -0-200 PSIG	<b>Inlet Gauge</b> 0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-6000 PSIG* G: 0-4000 PSIG†  *Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE Seat CAPSULE® †Maximum inlet pressure 3500 PSIG (240 BAR) with PCTFE seat CAPSULE	<b>Outlet Assemblies</b> 0: ¼" FPT Port 1: ¼" MPT 2: ¼" tube fitting 3: Diaphragm Valve ¼" Tube Fitting 4: Diaphragm valve ¼" MPT 5: Needle valve ¼" MPT 6: ⅜" Tube Fitting 7: ⅝" tube fitting 8: Diaphragm valve ⅜" tube fitting 9: Diaphragm valve ¼" FPT M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting	<b>Assembly/ Gauges</b> 0: Bare body 1: Cleanroom assembly (PSIG/kPa Gauges) 2: Cleanroom assembly (BAR/PSIG Gauges) 6: Mirror image (PSIG/kPa gauges) 7: Mirror image (BAR/PSIG gauges)	<b>Connections</b> 000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube TF6: ⅝" tube M06: 6mm tube CGA DIN 477 BS 341 and others available upon request	<b>Installed Options</b> B: Protocol Alarm Station (110/220V) C: Protocol Switchover Station* D: Deep Purge H: Protocol Switchover Station with Alarm (110/220V)* M: Protocol Station Q: Protocol Purge Station* S: Stainless steel bonnet  *Not available with 4500 PSIG (310 BAR) max inlet pressure
<b>Related Options</b>			<ul style="list-style-type: none"> <li>Panel Mount Kit (550-0002)</li> <li>Captured Vent Kit (550-0001)</li> </ul>		<ul style="list-style-type: none"> <li>Helium Leak Certification (476-0002)</li> </ul>		



## 430 Series

dual stage, stainless steel barstock regulator

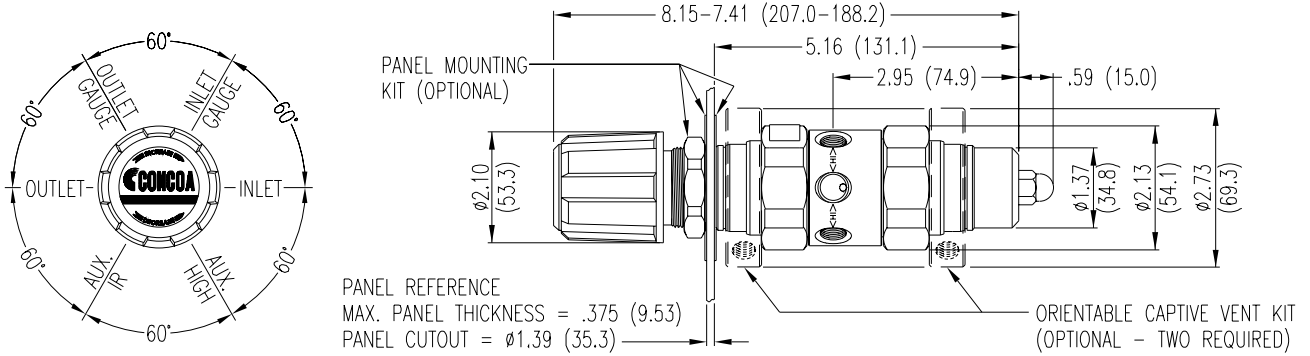
4



Description	Typical Applications
<p>The 430 Series SilcoNert™ 1020 coated regulators are intended for pressure control of reactive or corrosive calibration mixtures or pure gases in applications where an extremely inert wetted finish is required along with stable delivery pressure regardless of inlet pressure. The proprietary non-reactive amorphous Silicon finish is desired over standard 316L stainless steel and ideally suited for Hydrogen Sulfide, reduced Sulfur, Mercury and PPM to PPB calibration mixtures.</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• SilcoNert 1020 Barstock Body, Diaphragm, and Internals</li> <li>• Six Port Configuration</li> <li>• Inert Surface Finish and Corrosion Resistance</li> </ul>	<ul style="list-style-type: none"> <li>• Reactive calibration standard</li> <li>• Emissions monitoring</li> <li>• Hydrogen Sulfide PPM to PPB standards</li> <li>• Mercury standards</li> <li>• Sulfur mixtures</li> <li>• Corrosive service</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® Seat</i> Increased serviceability and life</li> <li>• <i>SilcoNert™ 1020 Barstock Body</i> Increased corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG</i> Broad range of applications</li> </ul>	<p><i>Body</i> SilcoNert 1020</p> <p><i>Bonnet</i> SilcoNert 1020</p> <p><i>Seat</i> PTFE (first stage) PTFE (second stage)</p> <p><i>Filter</i> SilcoNert 1020 10 micron mesh</p> <p><i>Diaphragm</i> SilcoNert 1020</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauge</i> 2" (53mm) diameter stainless steel (bourdon tube not SilcoNert™ 1020)</p> <p><i>Ports</i> 1/4" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (430 3331-330)</i> 5.09 lbs. (2.31 kg)</p>

Installation Dimensions



Ordering Information and Configuration Options

430	A		B	C	D	-CON	Options
Series	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/Gauges	Inlet Connections	Installed Options
430	<b>1:</b> 0-15 PSIG <b>2:</b> 0-50 PSIG <b>3:</b> 0-100 PSIG <b>4:</b> 0-250 PSIG <b>7:</b> 0-150 PSIG	<b>30"</b> -0-30 PSIG <b>30"</b> -0-100 PSIG <b>30"</b> -0-200 PSIG <b>0-400</b> PSIG <b>30"</b> -0-200 PSIG	<b>0:</b> None <b>3:</b> 0-4000 PSIG <b>5:</b> 0-1000 PSIG <b>6:</b> 0-300 PSIG <b>7:</b> 0-400 PSIG <b>8:</b> 0-6000 PSIG*	<b>0:</b> 1/4" FPT port <b>2:</b> 1/4" tube fitting <b>3:</b> Diaphragm valve 1/4" tube fitting <b>6:</b> 1/8" tube fitting <b>8:</b> Diaphragm valve 1/8" tube fitting <b>9:</b> Diaphragm valve 1/4" FPT <b>M:</b> 6mm tube fitting <b>S:</b> Diaphragm valve 6mm tube fitting	<b>0:</b> Bare body <b>1:</b> Cleanroom assembly (PSIG/ kPa gauges) <b>2:</b> Cleanroom assembly (BAR/ PSIG gauges)	<b>000:</b> 1/4" FPT <b>TF2:</b> 1/8" tube <b>TF4:</b> 1/4" tube <b>M06:</b> 6mm tube	<b>A:</b> Protocol alarm station (110V) <b>B:</b> Protocol alarm station (220V) <b>C:</b> Protocol switchover station* <b>G:</b> Protocol switchover station with alarm (110V)* <b>H:</b> Protocol switchover station with alarm (220V)* <b>M:</b> Protocol station <b>Q:</b> Protocol purge station*
			*Not available with 4500 PSIG maximum inlet pressure			CGA DIN 477 BS 341 and others available upon request	*Not available with 4500 PSIG max inlet pressure

Related Options

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit (2 required)
476 0002	Helium Leak certification

## 432 Series

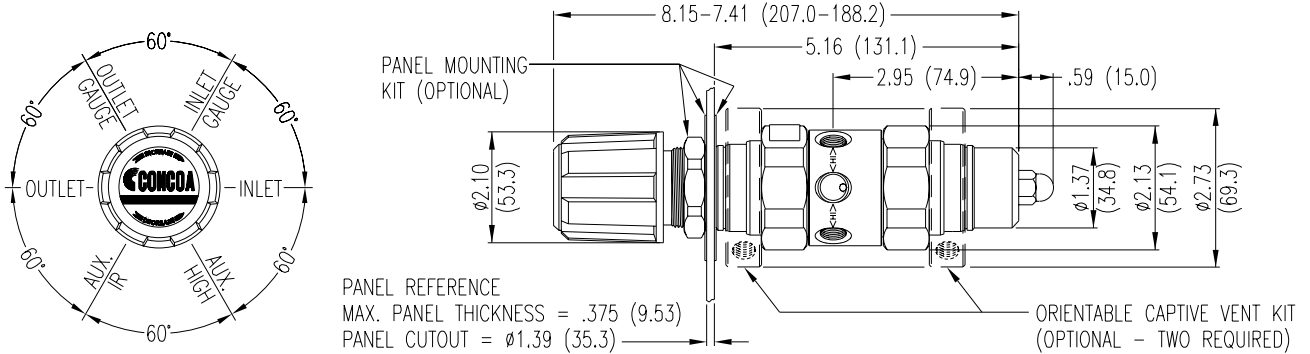
high purity, two stage, stainless steel barstock regulator



Description	Typical Applications
<p>The 432 Series regulators are intended for primary pressure control of ultra-high purity or corrosive gases for applications requiring constant pressure control and delivery regardless of supply pressure variations.</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Six Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• EPA protocol gases</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Corrosive gases</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>316L stainless steel diaphragm</i> Increased corrosion resistance</li> <li>• <i>Front Panel-Mountable</i> Easy Installation</li> <li>• <i>10 Micron Filtration in Both Stages</i> Fail-safe seat performance</li> <li>• <i>Pressure Ranges 0-15 to 0-350 PSIG (0-1 to 0-24 BAR)</i> Broad range of applications</li> <li>• <i>Pipe away relief valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PCTFE (first stage) PTFE (second stage)</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 3500 PSIG ( 240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (432-3331-580)</i> 5.09 lbs. (2.31 kg)</p>

Installation Dimensions



Ordering Information and Configuration Options

432	A		B	C	D	-CON	Options
Series	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/Gauges	Inlet Connections	Installed Options
432	<b>1:</b> 0-15 PSIG <b>2:</b> 0-50 PSIG <b>3:</b> 0-100 PSIG <b>4:</b> 0-250 PSIG <b>7:</b> 0-150 PSIG <b>E:</b> 0-350 PSIG	<b>30"-0-30 PSIG</b> <b>30"-0-100 PSIG</b> <b>30"-0-200 PSIG</b> <b>0-400 PSIG</b> <b>30"-0-200 PSIG</b> <b>0-400 PSIG</b>	<b>0:</b> None <b>3:</b> 0-4000 PSIG <b>5:</b> 0-1000 PSIG <b>6:</b> 0-300 PSIG <b>7:</b> 0-400 PSIG <b>8:</b> 0-6000 PSIG* <b>G:</b> 0-4000 PSIG†  *Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE seat CAPSULE®  †Maximum inlet pressure 3500 PSIG (240 BAR) with PCTFE seat CAPSULE	<b>0:</b> 1/4" FPT port <b>1:</b> 1/4" MPT <b>2:</b> 1/4" tube fitting <b>3:</b> Diaphragm valve 1/4" tube fitting <b>4:</b> Diaphragm valve 1/4" MPT <b>5:</b> Needle valve 1/4" MPT <b>6:</b> 1/8" tube fitting <b>7:</b> 3/8" tube fitting <b>8:</b> Diaphragm valve pressure 1/8" tube fitting <b>9:</b> Diaphragm valve 1/4" FPT <b>M:</b> 6mm tube fitting <b>S:</b> Diaphragm valve 6mm tube fitting	<b>0:</b> Bare body <b>1:</b> Cleanroom assembly (PSIG/ kPa gauges) <b>2:</b> Cleanroom assembly (BAR/ PSIG gauges)	<b>000:</b> 1/4" FPT <b>TF2:</b> 1/8" tube <b>TF4:</b> 1/4" tube <b>TF6:</b> 3/8" tube <b>M06:</b> 6mm tube  CGA DIN 477 BS 341 and others available upon request	<b>B:</b> Protocol alarm station (110/220 VAC) <b>C:</b> Protocol switchover station <b>D:</b> Deep purge* <b>H:</b> Protocol switchover station with alarm (110/220 VAC) <b>M:</b> Protocol station <b>Q:</b> Protocol purge station* <b>S:</b> Stainless steel bonnets

Related Options

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit (2 required)
476 0002	Helium Leak certification

## 401 Series

single stage, chrome-plated brass barstock regulator

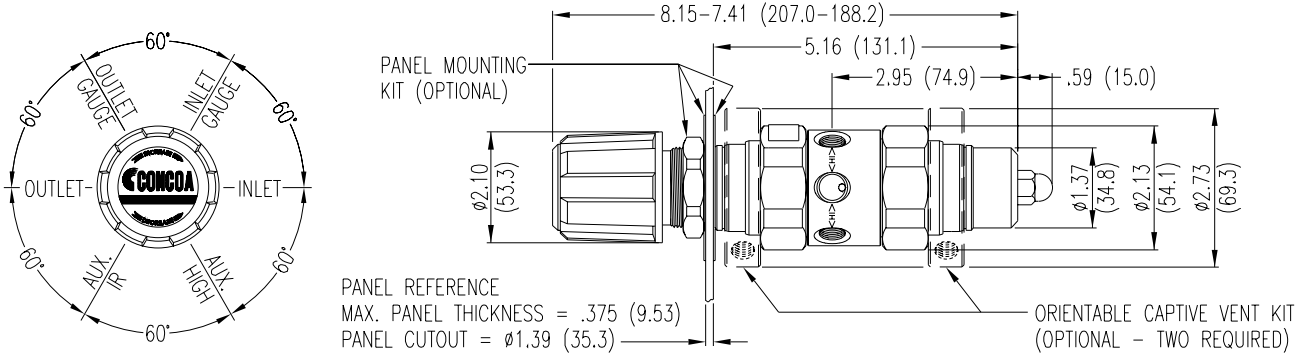


4

Description	Typical Applications
<p>The 401 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases, or for applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Brass Barstock Body</li> <li>• Six Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• EPA protocol standards</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>Chrome-plated Brass Barstock Body</i> Smooth surface finish</li> <li>• <i>Front Panel-Mountable</i> Easy Installation</li> <li>• <i>10 Micron Filtration in Both Stages</i> Fail-safe seat performance</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> <li>• <i>Pipe away relief valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> Chrome-plated brass barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE PCTFE with 3500 PSIG (240 BAR) or 4500 PSIG (310 BAR) inlet option</p> <p><i>Filter</i> 10 micron sintered bronze</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 3500 PSIG ( 240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (401-7331-580)</i> 3.99 lbs. (1.81 kg)</p>

**Installation Dimensions**



**Ordering Information and Configuration Options**

401	A	B	C	D	-CON	Options	
<b>Series</b>							
401	<p><b>Outlet Pressure</b></p> <p>1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG** 7: 0-150 PSIG A: 0-15 PSIG*</p> <p>*Not available with 4500 PSIG (310 BAR) maximum inlet pressure</p> <p>**Standard assembly does not include relief valve</p>	<p><b>Outlet Gauge</b></p> <p>30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG 0-30 PSIG***</p> <p>*** With redline for acetylene use.</p>	<p><b>Inlet Gauge</b></p> <p>0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-6000 PSIG* G: 0-4000 PSIG†</p> <p>*Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE seat CAPSULE®</p> <p>†Maximum inlet pressure 3500 PSIG (240 BAR) with PCTFE seat CAPSULE</p>	<p><b>Outlet Assemblies</b></p> <p>0: 1/4" FPT port 1: 1/4" MPT 2: 1/4" tube fitting 3: Diaphragm valve 1/4" tube fitting 4: Diaphragm valve 1/4" MPT 5: Needle valve 1/4" MPT 6: 1/8" tube fitting 7: 3/8" tube fitting 8: Diaphragm valve pressure 1/8" tube fitting 9: Diaphragm valve 1/4" FPT A: 3/8" BSP RH fitting B: Diaphragm valve 3/8" fitting C: 3/8" BSP LH fitting D: 6mm brass hose barb (not available if A=4 or 5) G: 1/8" stainless steel tube fitting H: 1/4" stainless steel tube fitting M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting</p>	<p><b>Assembly/Gauges</b></p> <p>0: Bare body 1: Cleanroom assembly (PSIG/kPa gauges) 2: Cleanroom assembly (BAR/PSIG gauges) 6: Mirror image (PSIG/kPa gauges) 7: Mirror image (BAR/PSIG gauges)</p>	<p><b>Inlet Connections</b></p> <p>000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube TF6: 3/8" tube M06: 6mm tube</p> <p>CGA DIN 477 BS 341 and others available upon request</p>	<p><b>Installed Options</b></p> <p>B: Protocol alarm station (110/220 VAC) C: Protocol switchover station D: Deep purge* H: Protocol switchover station with alarm (110/220 VAC) M: Protocol station Q: Protocol purge station*</p> <p>*Not available with 4500 PSIG (310 BAR) max inlet pressure</p>

**Related Options**

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit (2 required)
476 0002	Helium Leak certification

## 408 Series

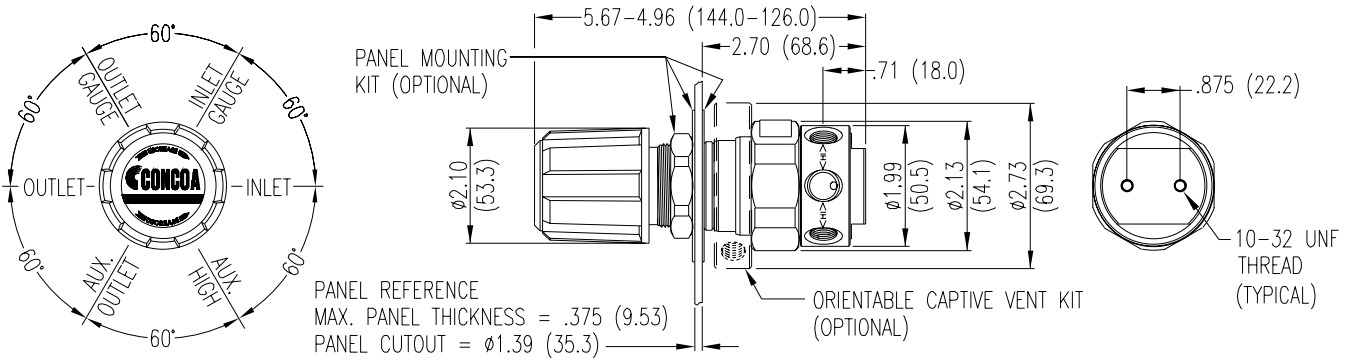
single stage, aluminum barstock regulator



Description	Typical Applications
<p>The 408 Series regulators are intended for primary pressure control of mildly corrosive high purity gases such as ammonia, hydrogen sulfide, and sulfur dioxide or for applications requiring the light weight of an aluminum body regulator.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Anodized Aluminum Barstock Body</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Semi-corrosive gases and mixtures</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Mildly corrosive gases</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>Anodized Aluminum Body</i> Cost-effective corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> Anodized aluminum barstock</p> <p><i>Bonnet</i> Anodized aluminum barstock</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (408-2331-000)</i> 2.7 lbs. (1.24 kg)</p>

**Installation Dimensions**



4

**Ordering Information and Configuration Options**

408	A		B	C	D	-CON	Options
Series 408	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/ Gauges	Inlet Connections	Installed Options
	<b>1:</b> 0-15 PSIG <b>2:</b> 0-50 PSIG <b>3:</b> 0-100 PSIG <b>4:</b> 0-250 PSIG <b>5:</b> 0-500 PSIG** <b>7:</b> 0-150 PSIG  *No relief valve	<b>30"</b> -0-30 PSIG <b>30"</b> -0-100 PSIG <b>30"</b> -0-200 PSIG 0-400 PSIG 0-1000 PSIG <b>30"</b> -0-200 PSIG	<b>0:</b> None <b>3:</b> 0-4000 PSIG <b>5:</b> 0-1000 PSIG <b>6:</b> 0-300 PSIG <b>7:</b> 0-400 PSIG	<b>0:</b> 1/4" FPT port <b>1:</b> 1/4" MPT <b>2:</b> 1/4" tube fitting <b>3:</b> Diaphragm valve 1/4" tube fitting <b>4:</b> Diaphragm valve 1/4" MPT <b>5:</b> Needle valve 1/4" MPT <b>6:</b> 1/8" tube fitting <b>7:</b> 3/8" tube fitting <b>8:</b> Diaphragm valve 1/8" tube fitting <b>9:</b> Diaphragm valve 1/4" FPT <b>M:</b> 6mm tube fitting <b>S:</b> Diaphragm valve 6mm tube fitting	<b>0:</b> Bare body <b>1:</b> Cleanroom assembly (PSIG/kPa gauges) <b>2:</b> Cleanroom assembly (BAR/PSIG gauges)	<b>000:</b> 1/4" FPT <b>TF2:</b> 1/8" tube <b>TF4:</b> 1/4" tube <b>TF6:</b> 3/8" tube <b>M06:</b> 6mm tube  CGA DIN 477 BS 341 and others available	<b>M:</b> Protocol station <b>D:</b> Deep purge <b>Q:</b> Protocol purge station

**Related Options**

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit
476 0002	Helium Leak certification



## 411 Series

dual stage, chrome-plated brass barstock regulator

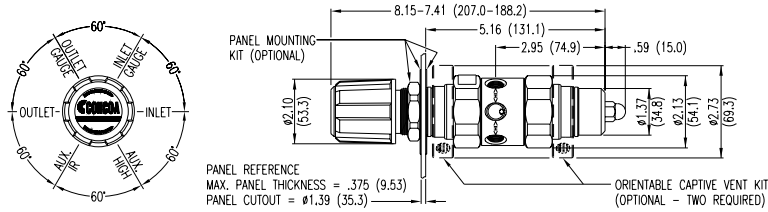


4

Description	Typical Applications
<p>The 411 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases for applications requiring constant pressure control and delivery regardless of supply pressure variations.</p> <ul style="list-style-type: none"> <li>• Dual Stage</li> <li>• Chrome-plated Brass Barstock</li> <li>• Six Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• EPA Protocol gases</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>CAPSULE® Seat</i> Increased serviceability and life</li> <li>• <i>Chrome-plated Brass Barstock Body</i> Smooth surface finish</li> <li>• <i>Front Panel-Mountable</i> Easy installation</li> <li>• <i>10 Micron Filtration in Both Stages</i> Fail-safe seat performance</li> <li>• <i>Pressure Ranges 0-15 to 0-350 PSIG (0-1 to 0-24 BAR)</i> Broad range of applications</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> Chrome-plated brass barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PCTFE (first stage) PTFE (second stage)</p> <p><i>Filter</i> 10 micron sintered bronze</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 3500 PSIG (240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter chrome-plated</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (411-2331-580)</i> 5.3 lbs. (2.40 kg)</p>

**Installation Dimensions**



**Ordering Information**

411	A		B	C	D	-CON	Options
Series 411	Max Outlet Pressure	Max Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG (0-1 BAR)	30"-0-30 PSIG/ -1-0-2 BAR	0: None	0: 1/4" FPT port	0: Bare body	000: 1/4" FPT	B: Protocol alarm station (110/220 VAC)
	2: 0-50 PSIG (0-3.5 BAR)	30"-0-100 PSIG/ -1-0-7 BAR	3: 0-4000 PSIG/0-275 BAR	1: 1/4" MPT	1: Cleanroom assembly (PSIG/kPa gauges)	TF2: 1/8" tube	C: Protocol switchover station
	3: 0-100 PSIG (0-7 BAR)	30"-0-200 PSIG/ -1-0-14 BAR	5: 0-1000 PSIG/0-70 BAR	2: 1/4" tube fitting	2: Cleanroom assembly (BAR/PSIG gauges)	TF4: 1/4" tube	D: Deep purge*
	4: 0-250 PSIG (0-17 BAR)	0-400 PSIG/ 0-27 BAR	6: 0-300 PSIG/0-21 BAR	3: Diaphragm valve 1/4" tube fitting		TF6: 3/8" tube	H: Protocol switchover station with alarm (110/220 VAC)
	7: 0-150 PSIG (0-10 BAR)	30"-0-200 PSIG/ -1-0-14 BAR	7: 0-400 PSIG/0-27 BAR	4: Diaphragm valve 1/4" MPT		M06: 6mm tube	M: Protocol station
	E: 0-350 PSIG (0-24 BAR)	0-400 PSIG/ 0-27 BAR	8: 0-6000 PSIG/0-415 BAR*	5: Needle valve 1/4" MPT		CGA DIN 477 BS 341 and others available	Q: Protocol purge station*
			G: 0-4000 PSIG/0-275 BAR†	6: 1/8" tube fitting			*Not available with 4500 PSIG (310 BAR) max inlet pressure
			*Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE seat CAPSULE®	7: 3/8" tube fitting			
			†Maximum inlet pressure 3500 PSIG (240 BAR) with PCTFE seat CAPSULE®	8: Diaphragm valve 1/8" tube fitting			
				9: Diaphragm valve 1/4" FPT			
				A: 3/8" BSP RH fitting			
				B: Diaphragm valve 3/8" tube fitting			
				C: 3/8" BSP LH fitting			
				D: 6mm brass hose barb (not available if A=4 or 5)			
				G: 1/8" stainless steel tube fitting			
				H: 1/4" stainless steel tube fitting			
				M: 6mm tube fitting			
				S: Diaphragm valve 6mm tube fitting			

**Related Options**

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit
476 0002	Helium Leak certification

## 304 Series

single stage, brass barstock line regulator

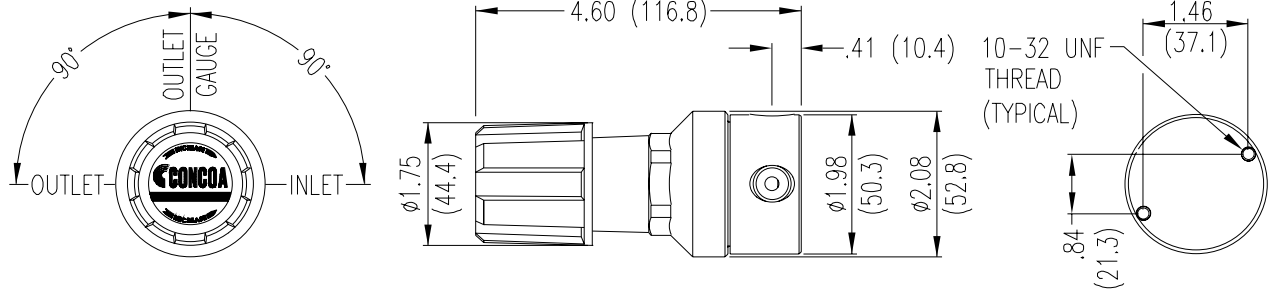


4

Description	Typical Applications
<p>The 304 Series regulators are intended for secondary pressure control of non-corrosive, high purity or liquefied gases or as point of use pressure control in high purity gas distribution systems.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Brass Barstock Body</li> <li>• Three Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <b>Capsule® seat</b> Increased serviceability and life</li> <li>• <b>316L Stainless Steel Diaphragm</b> No inboard diffusion</li> <li>• <b>Low Wetted Surface Area</b> Minimal purge requirements</li> <li>• <b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</li> <li>• <b>Convolutd Diaphragm</b> Smooth pressure changes</li> <li>• <b>Compact Design</b> Easily transported and integrated into systems</li> <li>• <b>Chrome-Plated Brass Barstock Body</b> Smooth surface finish</li> <li>• <b>Rear Panel-Mountable</b> Easy installation</li> <li>• <b>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</b> Broad range of applications</li> <li>• <b>3000 PSIG (210 BAR) Inlet Pressure Rating</b> Safe use with high pressure cylinders</li> </ul>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2" (53mm) diameter chrome-plated</p> <p><b>Ports</b> 1/4" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-9</sup> scc/sec</p> <p><b>Cv</b> 0.1 (Max outlet 50 PSIG or below)</p> <p><b>Weight (304-2021-000)</b> 1.7 lbs. (0.78 kg)</p>

**Installation Dimensions**



4

**Ordering Information**

304	A		B	C	D	-CON	Options
Series 304	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG 7: 0-150 PSIG	30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG	0: None	0: 1/4" FPT port 1: 1/4" MPT 2: 1/4" tube fitting 3: Diaphragm valve 1/4" tube fitting 4: Diaphragm valve 1/4" MPT 5: Needle valve 1/4" MPT 6: 1/8" tube fitting 7: 3/8" tube fitting 8: Diaphragm valve 1/8" tube fitting 9: Diaphragm valve 1/4" FPT A: 3/8" BSP RH fitting B: Diaphragm valve 3/8" tube fitting C: 3/8" BSP LH fitting D: 6mm brass hose barb (not available if A=4 or 5) G: 1/8" stainless steel tube fitting H: 1/4" stainless steel tube fitting M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting	0: Bare body 1: Standard assembly (PSIG/kPa gauges) 2: Standard assembly (BAR/PSIG gauges)	000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube TF6: 3/8" tube M06: 6mm tube	M: Protocol station Q: Protocol purge station

**Related Options**

Order No.	Description
835 0204	Rear panel mount kit

## 324 Series

single stage, stainless steel barstock line regulator

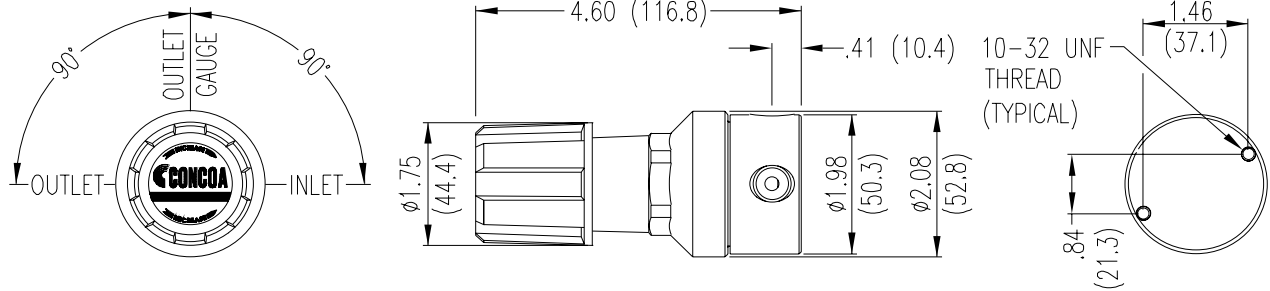


4

Description	Typical Applications
<p>The 324 Series regulators are intended for secondary pressure control of ultra-high purity and corrosive gases or as point of use pressure control in ultra-high purity as distribution systems.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Three Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• Ultra-high purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Capsule</i><sup>®</sup> seat Increased serviceability and life</li> <li>• <i>316L Stainless Steel Diaphragm</i> No inboard diffusion</li> <li>• <i>Low Wetted Surface Area</i> Minimal purge requirements</li> <li>• <i>Field-Adjustable Pressure Limit</i> Safeguard downstream equipment</li> <li>• <i>Convolute Diaphragm</i> Smooth pressure changes</li> <li>• <i>Compact Design</i> Easily transported and integrated into systems</li> <li>• <i>316L Stainless Steel Barstock Body</i> Increased corrosion resistance</li> <li>• <i>Rear Panel-Mountable</i> Easy installation</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> <li>• <i>3000 PSIG (210 BAR) Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated die cast zinc</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter Chrome-plated case Stainless steel internals</p> <p><i>Ports</i> 1/4" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (304-2021-000)</i> 2.4 lbs. (1.09 kg)</p>

Installation Dimensions



4

Ordering Information

324	A		B	C	D	-CON	Options
Series 324	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG 7: 0-150 PSIG	30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG	0: None	0: 1/4" FPT port 1: 1/4" MPT 2: 1/4" tube fitting 3: Diaphragm valve 1/4" tube fitting 4: Diaphragm valve 1/4" MPT 5: Needle valve 1/4" MPT 6: 1/8" tube fitting 7: 3/8" tube fitting 8: Diaphragm valve 1/8" tube fitting 9: Diaphragm valve 1/4" FPT M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting	0: Bare body 1: Standard assembly (PSIG/kPa gauges) 2: Standard assembly (BAR/PSIG gauges)	000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube TF6: 3/8" tube M06: 6mm tube	M: Protocol station Q: Protocol purge station

Related Options

Order No.	Description
835 0204	Rear panel mount kit

## 403 Series

single stage, brass barstock line regulator

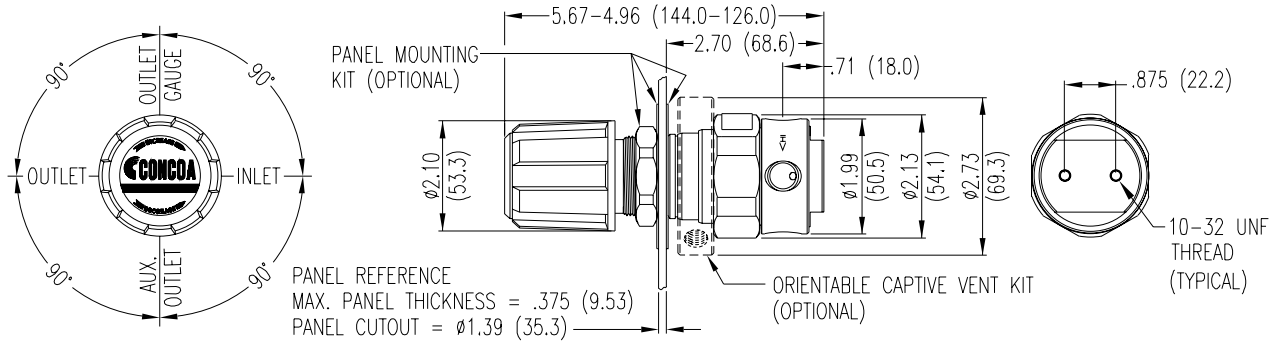


4

Description	Typical Applications
<p>The 403 Series regulators are intended for secondary pressure control of non-corrosive, high purity or liquefied gases or as point of use pressure control in high purity gas distribution systems.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-plated Brass Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>Chrome-plated Brass Barstock Body</i> Smooth surface finish</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> <li>• <i>3000 PSIG (210 BAR) Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> Chrome-plated brass barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> 10 micron sintered bronze</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter chrome-plated</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1 Max outlet 50 PSIG (3.5 BAR) or below 0.2 Max outlet above 50 PSIG (3.5 BAR)</p> <p><i>Weight (403-2021-000)</i> 2.71 lbs. (1.23 kg)</p>

**Installation Dimensions**



4

**Ordering Information**

403	A	B	C	D	-CON	Options	
Series 403	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG** 7: 0-150 PSIG  **Standard assembly does not include relief valve	30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG	0: None	0: 1/4" FPT port 1: 1/4" MPT 2: 1/4" tube fitting 3: Diaphragm valve 1/4" tube fitting 4: Diaphragm valve 1/4" MPT 5: Needle valve 1/4" MPT 6: 1/8" tube fitting 7: 3/8" tube fitting 8: Diaphragm valve 1/8" tube fitting 9: Diaphragm valve 1/4" FPT A: 3/8" BSP RH fitting B: Diaphragm valve 3/8" tube fitting C: 3/8" BSP LH fitting D: 6mm brass hose barb (Not available if A=4 or 5) G: 1/8" stainless steel tube fitting H: 1/4" stainless steel tube fitting M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting	0: Bare body 1: Standard assembly (PSIG/kPa gauges) 2: Standard assembly (BAR/PSIG gauges) 6: Mirror image (PSIG/kPa gauges) 7: Mirror image (BAR/PSIG gauges)	000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube TF6: 3/8" tube M06: 6mm tube	D: Deep purge M: Protocol station Q: Protocol purge station

**Related Options**

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit
476 0002	Helium Leak certification



## 445 Series

single stage, stainless steel barstock line regulator

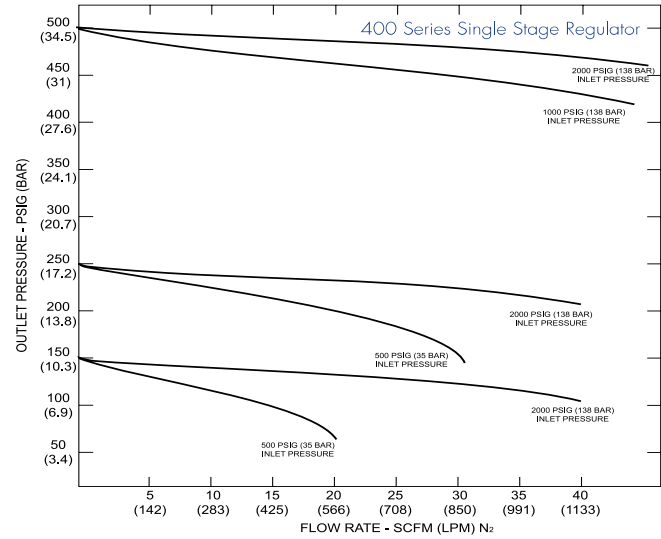
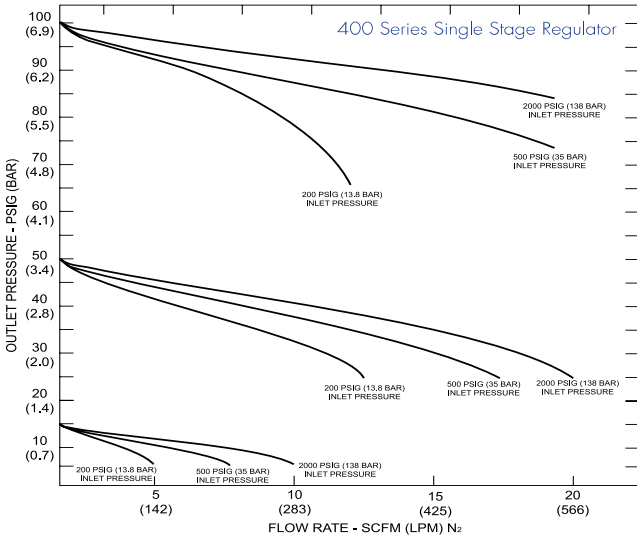


4

Description	Typical Applications
<p>The 445 Series regulators are intended for secondary pressure control of ultra high purity and corrosive gases or as point-of-use pressure control in high purity gas distribution systems.</p> <ul style="list-style-type: none"> <li>• Stainless steel barstock body, Smooth surface finish</li> <li>• Front and rear panel mountable, Versatile system configuration</li> <li>• Pressure ranges 0-15 to 0-500 PSIG, Broad range of applications</li> <li>• 3000 PSIG inlet pressure rating, Safe use with high pressure cylinders</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• Corrosive service</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>316L Stainless Steel Diaphragm</i> No inboard diffusion</li> <li>• <i>Orientable captured vent capable</i> Safety in any installation</li> <li>• <i>Low Wetted Surface Area</i> Minimal purge requirements</li> <li>• <i>Field-Adjustable Pressure Limit</i> Safeguard downstream equipment</li> <li>• <i>Pipe away relief valve</i> Safely vent exhaust gases</li> <li>• <i>Delivery pressure range easily changed</i> Maximum flexibility</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> 10 micron stainless steel multi-layer mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauge</i> 2" diameter stainless steel</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1 (Max outlet 50 PSIG or below) 0.2 (Max outlet above 50 PSIG)</p> <p><i>Weight (445-2021-TF4)</i> 2.57 lbs. (1.17 kg)</p>

Installation Dimensions



4

Ordering Information and Configuration Options

445	A	B	C	D	-CON	Options	
Series 445	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG 7: 0-150 PSIG	30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG	0: None	0: 1/4" FPT Port 1: 1/4" MPT 2: 1/4" Tube Fitting 3: Diaphragm Valve 1/4" Tube Fitting 4: Diaphragm Valve 1/4" MPT 5: Needle Valve 1/4" MPT 6: 1/8" Tube Fitting 7: 3/8" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting 9: Diaphragm Valve 1/4" FPT M: 6mm Tube Fitting S: Diaphragm Valve 6mm Tube Fitting	0: Bare Body 1: Standard Assembly (PSIG/kPa Gauge) 2: Standard Assembly (BAR/PSIG Gauge) 4: Cleanroom Assembly (PSIG/kPa Gauge) 5: Cleanroom Assembly (BAR/PSIG Gauge)	000: 1/4" FPT TF2: 1/8" Tube TF4: 1/4" Tube TF6: 3/8" Tube M06: 6mm Tube	S: Stainless Steel Bonnet

Related Options

- Panel Mount Kit (550-0002)
- Captured Vent Kit (550-0001)
- Helium Leak Certification (476-0002)
- Passivation for Fluorine Service

## 483 Series

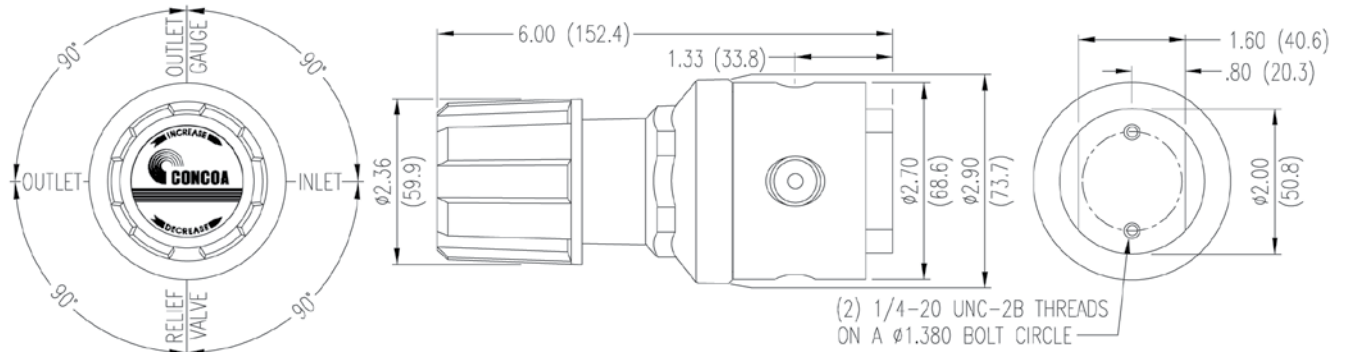
high flow, single stage, brass barstock line regulator



Description	Typical Applications
<p>The 483 Series regulator applications are wide and varied including high flow purging, non-corrosive process gas control, manifold and line regulation.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Ultra-High Flow</li> <li>• Brass Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>ISOFLOW Technology</i> Internal equalization provides constant delivery pressure at high flows</li> <li>• <i>Brass Barstock Body</i> Smooth surface finish</li> <li>• <i>Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-250 PSIG (0-1 to 0-17 BAR)</i> Broad range of applications</li> <li>• <i>3000 PSIG (210 BAR) Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> Brass barstock</p> <p><i>Bonnet</i> Chrome-plated die cast zinc</p> <p><i>Seat</i> PCTFE</p> <p><i>Filter</i> 40 micron 316L stainless steel mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauge</i> 2" (53mm) diameter brass</p> <p><i>Ports</i> 1/2" FPT (inlet/outlet) 1/4" FPT (gauge/relief valve)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 1.0</p> <p><i>Weight (483-3001-000)</i> 4.79 lbs. (2.17 kg)</p>

Installation Dimensions



Ordering Information and Configuration Options

483	A		B	C	D	-CON	Options
Series 483	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-40 PSIG 3: 0-120 PSIG 4: 0-200 PSIG 5: 0-250 PSIG	0-30 PSIG 0-60 PSIG 0-200 PSIG 0-400 PSIG 0-400 PSIG	0: None	0: 1/2" FPT Port 1: 1/2" Tube Fitting P: 12mm Tube Fitting	0: Bare Body 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges) 6: Mirror Image Assembly (PSIG/kPa Gauges) 7: Mirror Image Assembly (BAR/PSIG Gauges)	000: 1/2" FPT TF8: 1/2" Tube M12: 12mm Tube	None
Related Options							
None							

## 484 Series

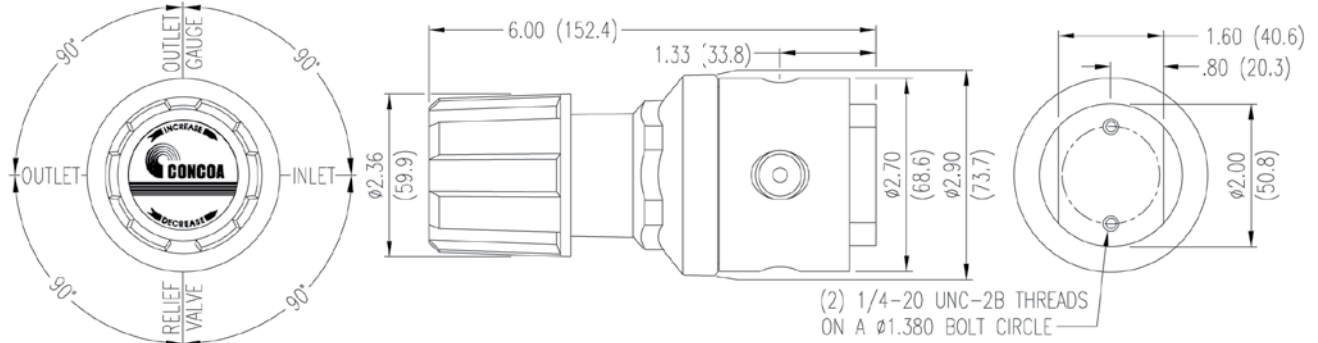
high flow, single stage, stainless steel barstock line regulator



Description	Typical Applications
<p>The 484 Series regulator applications are wide and varied including high flow purging, semiconductor CDA and bulk gas supply, modified atmosphere packaging, pharmaceutical processing, manifold and line regulation.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Ultra-High Flow</li> <li>• Stainless Steel Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• Corrosive gas service</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>PTFE Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>ISOFLOW Technology</i> Internal equalization provides constant delivery pressure at high flows</li> <li>• <i>316L Stainless Steel Barstock Body</i> Corrosion resistance for smooth surface finish</li> <li>• <i>Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-250 PSIG (0-1 to 0-17 BAR)</i> Broad range of applications</li> <li>• <i>3000 PSIG (210 BAR) Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated die cast zinc</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> 40 micron 316L stainless steel</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauge</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> 1/2" FPT (inlet/outlet) 1/4" FPT (gauge/relief valve)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 1.0</p> <p><i>Weight (484-3001-000)</i> 4.52 lbs. (2.05 kg)</p>

Installation Dimensions



4

Ordering Information and Configuration Options

484	A		B	C	D	-CON	Options
Series 484	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-40 PSIG 3: 0-120 PSIG 4: 0-200 PSIG 5: 0-250 PSIG	0-30 PSIG 0-60 PSIG 0-200 PSIG 0-400 PSIG 0-400 PSIG	0: None	0: 1/2" FPT Port 1: 1/2" Tube Fitting P: 12mm Tube Fitting	0: Bare Body 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges)	000: 1/2" FPT TF8: 1/2" Tube M12: 12mm Tube	None
Related Options							
None							

None

## 308 Series

heated, single stage, brass barstock regulator

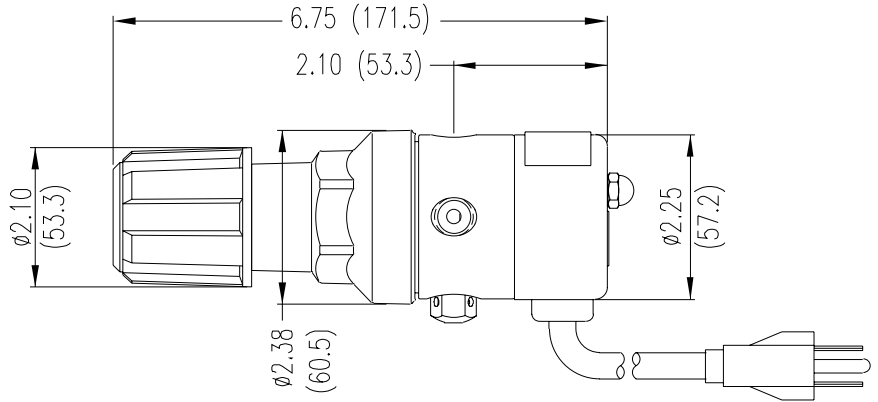
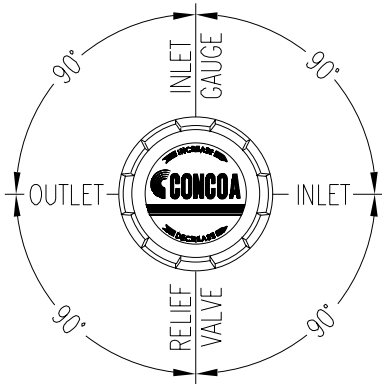


Description	Typical Applications
<p>The 308 Series regulators are specifically designed to prevent freeze-up problems associated with high flows of carbon dioxide and nitrous oxide. As Carbon Dioxide or Nitrous Oxide passes through a regulator seat, dry ice can form if the flow is too high, causing the regulator to freeze up.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Brass Barstock Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Electrically Heated</li> <li>• NEMA 4</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical storage blanketing</li> <li>• Anaerobic chambers</li> <li>• Inert gas purging</li> <li>• Atomic absorption oxidizer gas</li> <li>• Semiconductor reactor furnace</li> <li>• Inductively coupled plasma systems</li> <li>• Ph control</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <b>CAPSULE® Seat</b> Increased serviceability and life</li> <li>• <b>316L Stainless Steel Diaphragm</b> No inboard diffusion</li> <li>• <b>Low Wetted Surface Area</b> Minimal purge requirements</li> <li>• <b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</li> <li>• <b>Convolute Diaphragm</b> Smooth pressure changes</li> <li>• <b>Compact Design</b> Easily transported and integrated into systems</li> <li>• <b>Three 50-Watt Heaters</b> Maintain gas flow up to 350 SCFH (165 LPM)</li> <li>• <b>316L Stainless Steel Diaphragm</b> Unaffected by low temperatures</li> <li>• <b>NEMA 4 Housing</b> For either indoor or outdoor use</li> </ul>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p> <p><b>Electrical Housing</b> NEMA 4</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range (Thermostat)</b> 95°F to 120°F (35°C to 49°C)</p> <p><b>Heaters</b> 3 @ 50 watts each (110 or 220 VAC)</p> <p><b>Gauges</b> 2" (53mm) diameter chrome-plated brass</p> <p><b>Ports</b> 1/4" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.1</p> <p><b>Weight (308-3301-330)</b> 5.4 lbs. (2.45 kg)</p>

**Installation Dimensions**

4



**Ordering Information**

308	A		B	C	D	-CON	Options
Series 308	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-30 PSIG 3: 0-50 PSIG 5: 0-100 PSIG	0-30 PSIG 0-60 PSIG 0-100 PSIG 0-200 PSIG	0: None 3: 0-4000 PSIG	0: ¼" FPT Port 1: ¼" MPT 2: ¼" Tube Fitting 3: Diaphragm Valve ¼" Tube Fitting 4: Diaphragm Valve ¼" MPT 5: Needle Valve ¼" MPT 6: ⅜" Tube Fitting 7: ⅝" Tube Fitting 8: Diaphragm Valve ⅜" Tube Fitting 9: Diaphragm Valve ¼" FPT A: ⅜" BSP Right Hand Fitting M: 6mm Tube Fitting S: Diaphragm Valve 6mm Tube Fitting	0: Bare Body 110 VAC 1: Standard Assembly 110 VAC (PSIG/kPa Gauges) 2: Bare Body 220 VAC 3: Standard Assembly 220 VAC (PSIG/kPa Gauges) 4: Standard Assembly 110 VAC (BAR/PSIG Gauges) 5: Standard Assembly 220 VAC (BAR/PSIG Gauges)	000: ¼" FPT TF2: ⅛" Tube TF4: ¼" Tube TF6: ⅜" Tube M06: 6mm Tube CGA DIN 477 BS 341 and others available	M: Protocol Station



## 322 Series

single stage, stainless steel barstock regulator

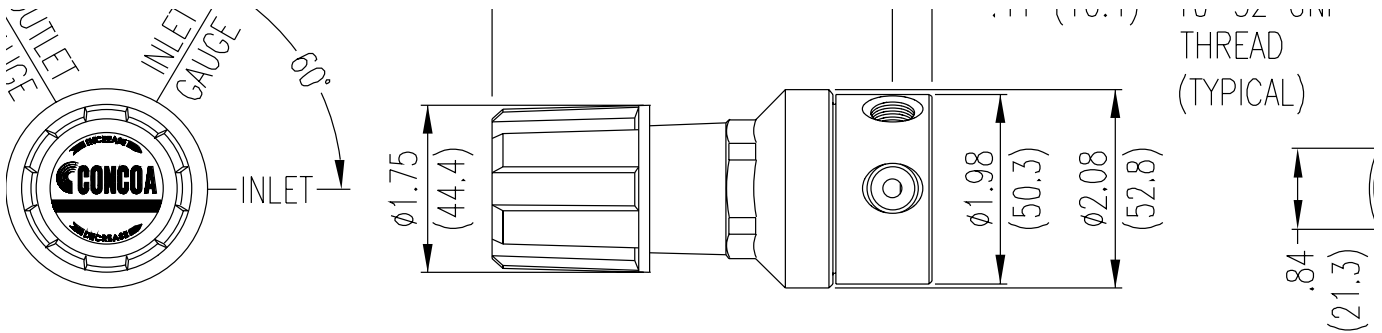


4

Description	Typical Applications
<p>The 322 Series regulators are intended for primary pressure control of ultra-high purity and corrosive gases in applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <b>CAPSULE® Seat</b> Increased serviceability and life</li> <li>• <b>316L Stainless Steel Diaphragm</b> No inboard diffusion</li> <li>• <b>Low Wetted Surface Area</b> Minimal purge requirements</li> <li>• <b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</li> <li>• <b>Convolute Diaphragm</b> Smooth pressure changes</li> <li>• <b>Compact Design</b> Easily transported and integrated into systems</li> <li>• <b>316L Stainless Steel Barstock Body</b> Increased corrosion resistance</li> <li>• <b>Rear Panel-Mountable</b> Easy installation</li> <li>• <b>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-35 BAR)</b> Broad range of applications</li> </ul>	<p><b>Body</b> 316L stainless steel barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE PCTFE with 3500 PSIG (240 BAR) or 4500 PSIG (310 BAR) inlet option</p> <p><b>Filter</b> Patented 10 micron 316 mesh</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR) 3500 PSIG (240 BAR) optional 4500 PSIG (310 BAR) optional</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2" (53mm) diameter chrome-plated brass case Stainless steel internals</p> <p><b>Ports</b> ¼" FPT</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.1</p> <p><b>Weight (322-2331-580)</b> 3.0 lbs. (1.34 kg)</p>

Installation Dimensions



4

Ordering Information

322	A		B	C	D	-CON	Options
Series 322	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG* 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG 7: 0-150 PSIG  *Not available with 4500 PSIG (310 BAR) maximum inlet pressure	30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG	0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-6000 PSIG* G: 0-4000 PSIG†  *Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE Seat CAPSULE®  †Maximum inlet pressure 3500 PSIG (240 BAR) with PCTFE	0: 1/4" FPT Port 1: 1/4" MPT 3: Diaphragm Valve 1/4" Tube Fitting 4: Diaphragm Valve 1/4" MPT 5: Needle Valve 1/4" MPT 6: 1/8" Tube Fitting 7: 3/8" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting 9: Diaphragm Valve 1/4" FPT M: 6mm Tube Fitting S: Diaphragm Valve 6mm Tube Fitting	0: Bare Body 1: Standard Assembly (PSIG/ kPa Gauges)	000: 1/4" FPT TF2: 1/8" Tube TF6: 3/8" Tube M06: 6mm Tube  CGA DIN 477 BS 341 and others available	B: Protocol alarm station (110/220 VAC) C: Protocol switchover station H: Protocol switchover station with alarm (110/220 VAC) M: Protocol station Q: Protocol purge station* T: Tee purge*  *Not available with 4500 PSIG (310 BAR) max inlet pressure

Related Options

Order No.	Description
835 0204	Rear panel mount kit

## 425 Series

single stage, stainless steel barstock regulator

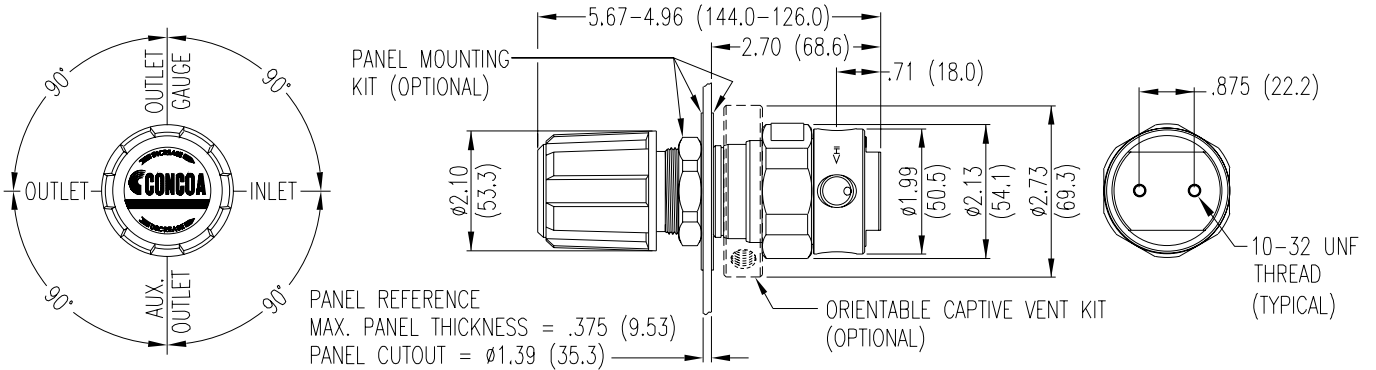


4

Description	Typical Applications
<p>The 425 Series regulators are intended for secondary pressure control of ultra-high purity and corrosive gases or as point-of-use pressure control in ultra-high purity gas distribution systems.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Four Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• Ultra-high purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• Corrosive gases</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>CAPSULE® Seat</i> Increased serviceability and life</li> <li>• <i>316L Stainless Steel Barstock Body</i> Increased corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> <li>• <i>3000 PSIG (210 BAR) Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range (Thermostat)</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 0.1 (Max outlet 50 PSIG/1 BAR or below) 0.2 (Max outlet above 50 PSIG/3.5 BAR)</p> <p><i>Weight (425-2021-TF4)</i> 2.58 lbs. (1.17 kg)</p>

**Installation Dimensions**



**Ordering Information**

425	A		B	C	D	-CON	Options
Series 425	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-250 PSIG 5: 0-500 PSIG** 7: 0-150 PSIG  *Standard assembly does not include relief valve	30"-0-30 PSIG 30"-0-100 PSIG 30"-0-200 PSIG 0-400 PSIG 0-1000 PSIG 30"-0-200 PSIG	0: None	0: 1/4" FPT Port 1: 1/4" MPT 2: 1/4" Tube Fitting 3: Diaphragm Valve 1/4" Tube Fitting 4: Diaphragm Valve 1/4" MPT 5: Needle Valve 1/4" MPT 6: 1/8" Tube Fitting 7: 3/8" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting 9: Diaphragm Valve 1/4" FPT M: 6mm Tube Fitting S: Diaphragm Valve 6mm Tube Fitting	0: Bare Body 110 VAC 1: Cleanroom Assembly (PSIG/kPa Gauges) 2: Cleanroom Assembly (PSIG/kPa Gauges) 6: Mirror Image Assembly (PSIG/kPa Gauges) 7: Mirror Image Assembly (BAR/PSIG Gauges)	000: 1/4" FPT TF2: 1/8" Tube TF4: 1/4" Tube TF6: 3/8" Tube M06: 6mm Tube	M: Protocol Station Q: Protocol purge station S: Stainless steel bonnet

**Related Options**

Order No.	Description
550 0002	Panel mount kit
550 0001	Captured vent kit
476 0002	Helium Leak certification

## 325 Series

single stage, chrome-plated brass barstock lecture bottle regulator

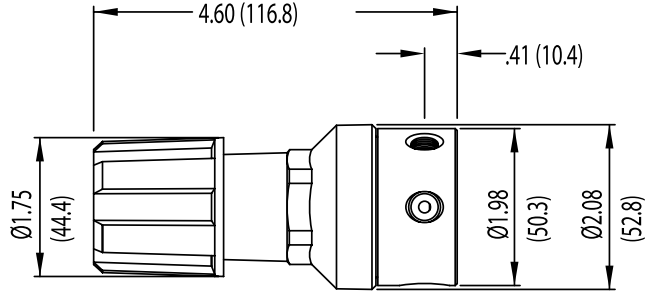
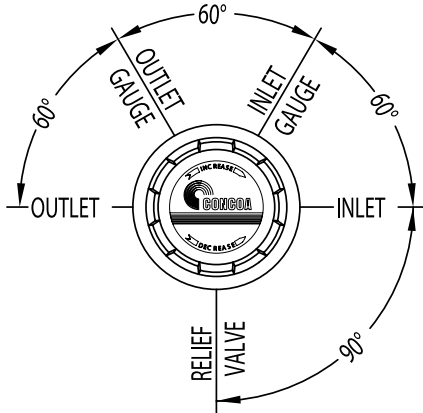


4

Description	Typical Applications
<p>The 325 Series regulators are specifically designed for use with non-corrosive gases in lecture bottles. The incorporation of our smallest CAPSULE® allows excellent pressure regulation over the useful pressure range of a lecture bottle.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Chrome-Plated Brass Barstock Body</li> <li>• 316L Stainless Steel Diaphragm</li> <li>• Lecture Bottle Regulator</li> </ul>	<ul style="list-style-type: none"> <li>• University classrooms</li> <li>• University laboratories</li> <li>• Chemical research</li> <li>• Pharmaceutical manufacturing</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <b>CAPSULE® Seat</b> Increased serviceability and life</li> <li>• <b>316L Stainless Steel Diaphragm</b> No inboard diffusion</li> <li>• <b>Low Wetted Surface Area</b> Minimal purge requirements</li> <li>• <b>Field-Adjustable Pressure Limit</b> Safeguard downstream equipment</li> <li>• <b>Convolute Diaphragm</b> Smooth pressure changes</li> <li>• <b>Compact Design</b> Easily transported and integrated into systems</li> <li>• <b>Chrome-Plated Brass Barstock Body</b> Smooth surface finish</li> <li>• <b>Low Droop</b> Stable outlet pressure</li> <li>• <b>1 1/2" (38mm) Pressure Gauges</b> Small envelope</li> </ul>	<p><b>Body</b> Chrome-plated brass barstock</p> <p><b>Bonnet</b> Chrome-plated die cast zinc</p> <p><b>Seat</b> PTFE</p> <p><b>Filter</b> 10 micron sintered bronze</p> <p><b>Diaphragm</b> 316L stainless steel</p> <p><b>Internal Seals</b> PTFE</p>	<p><b>Maximum Inlet Pressure</b> 3000 PSIG (210 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 1½" (38mm) diameter chrome-plated brass case</p> <p><b>Ports</b> ⅛" FPT (¼" FPT relief valve)</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p> <p><b>Cv</b> 0.02</p> <p><b>Weight (325-3351-170)</b> 2.0 lbs. (0.89 kg)</p>

Installation Dimensions



4

Ordering Information

325	A		B	C	D	-CON	Options
Series 325	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 3: 0-50 PSIG	0-30 PSIG 0-100 PSIG	0: None 3: 0-4000 PSIG	0: 1/8" FPT Port 1: 1/4" MPT 5: Needle Valve 1/8" MPT	0: Bare Body 1: Standard Assembly	000: 1/8" FPT CGA 110 CGA 170 CGA 180	None

## Lecture Bottle Equipment



### Series 3910

single stage brass lecture bottle regulator

### Series 3920

single stage stainless steel lecture bottle regulator

Description	Advanced Features		
The Series 3910 regulator is designed for use with non-corrosive, non-toxic gases in lecture bottles. The Series 3920 lecture bottle regulator is designed for use with corrosive, and/or toxic lecture bottle gases. These light weight, compact single stage regulators incorporate many features found in our larger high purity regulators	<ul style="list-style-type: none"> <li>• Small compact design.</li> </ul>		<ul style="list-style-type: none"> <li>• Needle valve installed on outlet.</li> </ul>
	Specifications		
	<i>Max. Inlet Pressure</i> <i>Operating Temp. Range</i> <i>Flow Coefficient (C<sub>v</sub>)</i> <i>Body Inlet Connection</i> <i>Body Outlet Connection</i> <i>Outlet Valve Connection</i>	Series 3910 3000 psig 0 to +140°F 0.02 1/8" NPT female 1/4" NPT female 1/4" NPT female	Series 3900 3000 psig -40 to +140°F 0.06 1/8" NPT female 1/8" NPT female 1/8" NPT female

Materials			
<i>Body</i> <i>Internal Seals</i> <i>Seat</i> <i>Diaphragm</i> <i>Filter</i> <i>Bonnet</i> <i>Gauges</i> <i>Outlet Valve</i>	Series 3910 chrome-plated brass nylon polyurethane neoprene 50 micron sintered bronze chrome plated brass chrome plated brass chrome plated brass	Series 3920 316 stainless steel Teflon® & Kel-F® Teflon PFA® 316 stainless steel 50 micron stainless steel anodized aluminum stainless steel stainless steel	Series 3900 Aluminum Teflon® & Kel-F® Teflon PFA® 316 stainless steel 50 micron stainless steel anodized aluminum brass brass

Ordering Information			
Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig
3910-15-170	2-15	0-30	0-4000
3910-60-170	4-60	0-100	0-4000
3910-15-180	2-15	0-30	0-4000
3910-60-180	4-60	0-100	0-4000
3900-30-170	2-30	0-60	0-3000
3900-30-180	2-30	0-60	0-3000
3900-60-170	2-60	0-100	0-3000
3900-60-180	2-60	0-100	0-3000
T3920-30-180	2-30	0-60	0-3000
T3920-60-180	2-60	0-100	0-3000

**Lecture Bottle Equipment (cont.)**

4

**Description**

Lecture bottles have rounded ends and require some means of support when in use. We provide two types of holders here that meet most requirements.

**Non-Tip Stand - Model 475**

This stand offers a convenient method of securing a lecture bottle on a table or lab bench. The stand is made of light weight brushed aluminum and, yet the large diameter base provides stability even when a regulator is installed on the bottle.

**Wall Mount Lecture Bottle Bracket - Model 480**

This bracket is made of powder coated steel and has spring steel clips that provide firm, secure support to the lecture bottle. The bracket is ideal for securing lecture bottles to lab cart or bench set-ups, in carrying cases for portable systems, or in storage cabinets.

**Lecture Bottle Control Valves - Models 3990-3993**

These valves are specifically designed for attachment to lecture bottles to dispense their contents. They do not control pressure and should only be used when the operator is in attendance.



**Materials**

	3990	3991	3992	3993
<i>Body</i>	brass	brass	316 stainless steel	aluminum-silicon bronze
<i>Stem</i>	303 stainless steel	303 stainless steel	316 stainless steel	Monel®
<i>Packing</i>	Teflon®	Teflon®	Teflon®	Teflon®
<i>Tubing</i>	hose barb	brass	316 stainless steel	Monel®

**Ordering Information**

Model Number	Inlet Connection	Outlet Connection
3990-CGA	Specify CGA 170 or 180	1/4" O.D. hose barb
3991-CGA	Specify CGA 170 or 180	1/4" compression fitting w/10" long brass tubing
3992-180	CGA 180	1/4" compression fitting w/10" long SS tubing
3993-ASB-180	CGA 180	1/4" compression fitting w/10" long monel® tubing



## 428 Series

single stage, stainless steel barstock line regulator

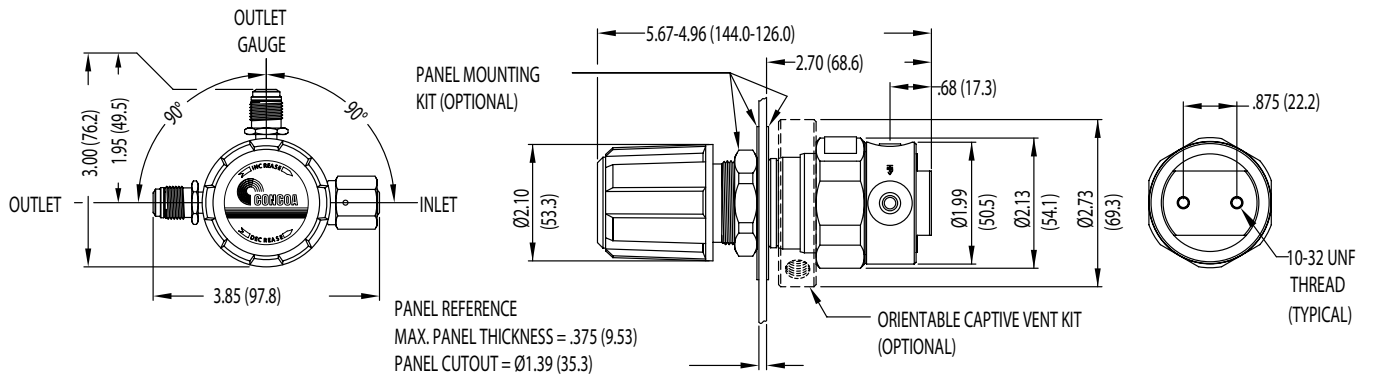


4

Description	Typical Applications
<p>The 428 Series regulators are intended for secondary pressure control of the highest purity gases or as point of use pressure control in high purity gas distribution systems.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Three Port Configuration</li> <li>• Face Seal Connections</li> </ul>	<ul style="list-style-type: none"> <li>• Semiconductor process gases</li> <li>• Photovoltaic manufacturing</li> <li>• Ultra-high purity gases</li> <li>• Pharmaceutical processing</li> <li>• Aerospace systems</li> <li>• Nanotechnology research</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>Butt-Welded Face Seal Connections</i> Highest leak integrity available</li> <li>• <i>316L Stainless Steel Barstock Body</i> Increased corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>3000 PSIG Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauge</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" face seal connection</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (428-3302-001)</i> 2.46 lbs. (1.12 kg)</p>

Installation Dimensions



Ordering Information and Configuration Options

428	A	B	C	D
<b>Series 428</b>	<b>Outlet Pressure</b> 1: 0-15 PSIG 2: 0-30 PSIG 3: 0-50 PSIG 4: 0-100 PSIG 5: 0-250 PSIG 6: 0-500 PSIG 7: 0-150 PSIG	<b>Outlet Gauge</b> 0: None 1: 30"-0-30 PSIG 2: 30"-0-60 PSIG 3: 30"-0-100 PSIG 4: 30"-0-200 PSIG 5: 0-400 PSIG 6: 0-1000 PSIG	<b>Inlet Gauge</b> 0: None	<b>Connections</b> 1: Female face seal/male face seal 2: Male face seal/male face seal 3: Male face seal/female face seal 4: Female face seal/female face seal

Related Options

Option	Order No.	Description
Panel Mount Kit	550-0002	To mount the regulator using bonnet threads. Material: Nickel-plated brass 360° orientation for easy piping of vented gases to a safe location in the event of diaphragm failure. Material: Nickel-plated brass Inboard Helium leak certification to less than 1 x 10 <sup>-8</sup> scc/sec
Captured Vent Kit	550-0001	
Helium Leak Certification	476-0002	

## 429 Series

corrosion resistant, single stage, stainless steel barstock line regulator

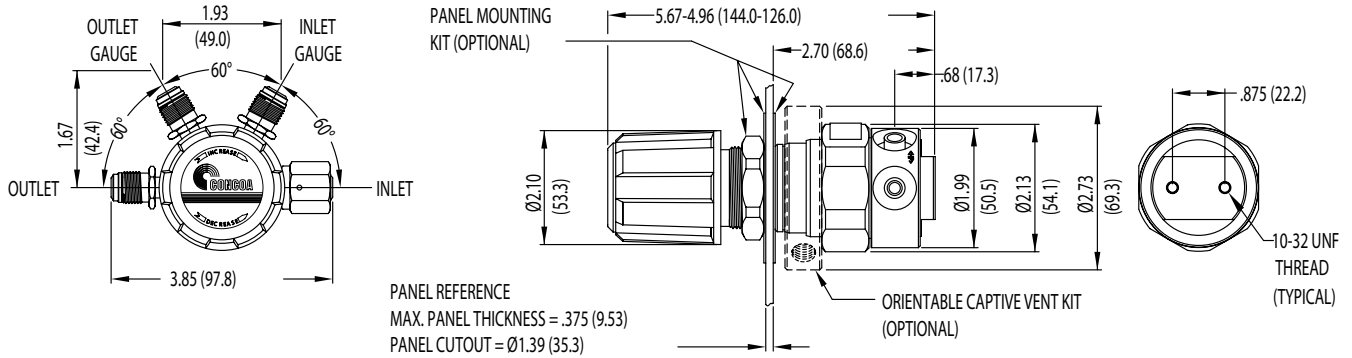


4

Description	Typical Applications
<p>The 429 Series regulators are intended for primary pressure control of the highest purity gases or for applications where minor fluctuations in outlet pressure due to diminishing inlet supply pressure can be tolerated.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Four Port Configuration</li> <li>• Face Seal Connections</li> </ul>	<ul style="list-style-type: none"> <li>• Semiconductor process gases</li> <li>• Photovoltaic manufacturing</li> <li>• Ultra-high purity gases</li> <li>• Pharmaceutical processing</li> <li>• Aerospace systems</li> <li>• Nanotechnology research</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>Butt-Welded Face Seal Connections</i> Highest leak integrity available</li> <li>• <i>316L Stainless Steel Barstock Body</i> Increased corrosion resistance</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>3000 PSIG Inlet Pressure Rating</i> Safe use with high pressure cylinders</li> <li>• <i>Pressure Ranges 0-15 to 0-500 PSIG (0-1 to 0-34 BAR)</i> Broad range of applications</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> Patented 10 micron 316 mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Ports</i> ¼" face seal connection</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (429-2241-001)</i> 2.73 lbs. (1.24 kg)</p>

Installation Dimensions



Ordering Information and Configuration Options

429	A	B	C	D
<b>Series 429</b>	<b>Outlet Pressure</b> 1: 0-15 PSIG 2: 0-30 PSIG 3: 0-50 PSIG 4: 0-100 PSIG 5: 0-250 PSIG 6: 0-500 PSIG 7: 0-150 PSIG	<b>Outlet Gauge</b> 0: None 1: 30"-0-30 PSIG 2: 30"-0-60 PSIG 3: 30"-0-100 PSIG 4: 30"-0-200 PSIG 5: 0-400 PSIG 6: 0-1000 PSIG	<b>Inlet Gauge</b> 0: None 1: 0-4000 PSIG 2: 0-400 PSIG 3: 0-1000 PSIG 4: 0-3000 PSIG 5: 30"-0-200 PSIG 6: 30"-0-100 PSIG 7: 30"-0-60 PSIG 8: 30"-0-30 PSIG	<b>Connections</b> 1: Female face seal/male face seal 2: Male face seal/male face seal 3: Male face seal/female face seal 4: Female face seal/female face seal

Related Options

Option	Order No.	Description
Panel Mount Kit	550-0002	To mount the regulator using bonnet threads. Material: Nickel-plated brass
Captured Vent Kit	550-0001	
Helium Leak Certification	476-0002	360° orientation for easy piping of vented gases to a safe location in the event of diaphragm failure. Material: Nickel-plated brass
0.01 micron filter	580-2001	Inboard Helium leak certification to less than 1 x 10 <sup>-8</sup> scc/sec
		Attached at outlet for low particle count gases (with ¼" VCR® connections only)

## 455 Series

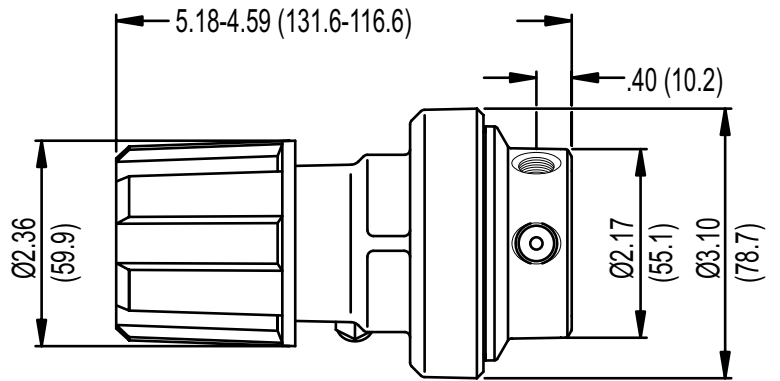
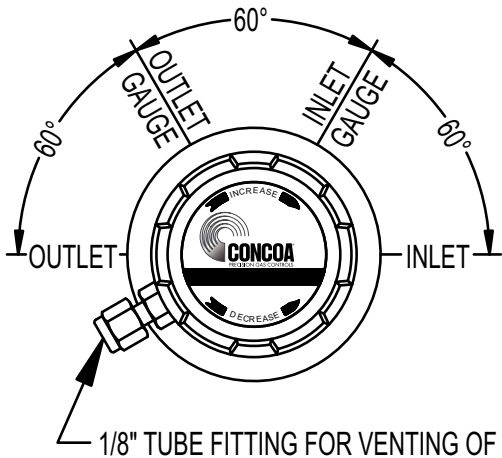
corrosion resistant, electroless nickel-plated forged brass regulator



Description	Typical Applications
<p>The 455 Series regulators are intended for primary pressure control of highly corrosive gases such as chlorides, sulfides, and other acid-forming gases.</p> <p>Deep Purge For safety and corrosion prevention, CONCOA highly recommends the addition of a Deep Purge assembly to the 455 Series regulator. Completely purging a system prevents the release of hazardous gases into the work place. In addition, the Deep Purge prevents the introduction of moisture to the regulator which forms acids in the body and results in corrosion.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Electroless Nickel-Plated Forged Brass Body</li> <li>• Corrosive Service</li> </ul>	<ul style="list-style-type: none"> <li>• Hydrogen chloride</li> <li>• Chlorine</li> <li>• Boron trichloride</li> <li>• Hydrogen sulfide</li> <li>• Dichlorosilane</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Nickel-Plated Forged Brass Body</i> Durable, long lasting construction</li> <li>• <i>Convolute 316L Stainless Steel Diaphragm</i> Sensitive to downstream changes</li> <li>• <i>CAPSULE® Seat</i> Serviceability and long life</li> <li>• <i>Captured Vent Standard</i> Safely vent exhaust gases</li> <li>• <i>Hastelloy® Seat Assembly</i> Superior corrosion resistance</li> <li>• <i>High Load Marginal Spring</i> Positive seat closure</li> </ul>	<p><i>Body</i> Electroless nickel-plated forged brass</p> <p><i>Bonnet</i> Electroless nickel-plated forged brass</p> <p><i>Seat</i> PTFE</p> <p><i>Nozzle</i> Hastelloy®</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Diaphragm Seal</i> PTFE</p> <p><i>Filter</i> 10 micron Hastelloy®</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2½" (53mm) diameter Monel®</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.2</p> <p><i>Weight (455-2332-660)</i> 7.23 lbs. (3.28 kg)</p>

Installation Dimensions



4

Ordering Information

455	A		B	C	D	-CON	Options
Series 455	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-40 PSIG 3: 0-120 PSIG 4: 0-200 PSIG 5: 0-250 PSIG	30"-0-30 PSIG 0-60 PSIG 0-200 PSIG 0-400 PSIG 0-400 PSIG	0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-200 PSIG	0: 1/4" FPT port 1: 1/4" MPT 2: 1/4" tube fitting 3: Diaphragm valve 1/4" tube fitting 4: Diaphragm valve 1/4" MPT 5: Needle valve 1/4" MPT 6: 1/8" tube fitting 7: 3/8" tube fitting 8: Diaphragm valve 1/8" tube fitting 9: Diaphragm valve 1/4" FPT M: 6mm tube fitting S: Diaphragm valve 6mm tube fitting	0: Bare body 1: Standard assembly (PSIG/kPa gauges) 2: Standard assembly (BAR/PSIG gauges) 4: Standard assembly without deep purge (BAR/PSIG gauges) 5: Standard assembly with deep purge (BAR/PSIG gauges)	000: 1/4" FPT TF2: 1/8" tube TF4: 1/4" tube TF6: 3/8" tube M06: 6mm tube CGA DIN 477 BS 341 and others available	None

## 486 Series

single stage, stainless steel regulator

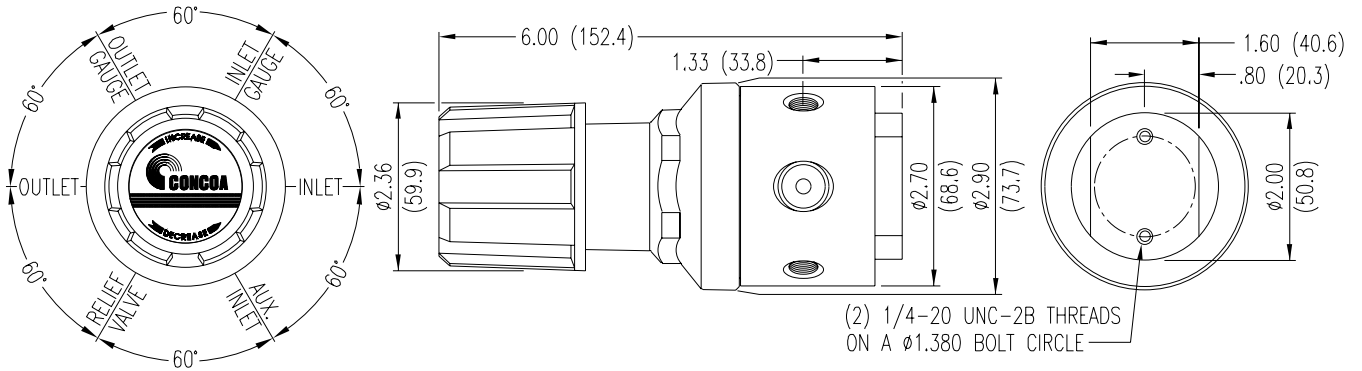


4

Description	Typical Applications
<p>The 486 Series regulator applications are wide and varied including high flow purging, semiconductor CDA and bulk gas supply, modified atmosphere packaging, pharmaceutical processing, manifold and line regulation.</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Ultra-High Flow</li> <li>• 316L Stainless Steel Barstock Body</li> <li>• Six Port Configuration</li> <li>• 316L Stainless Steel Diaphragm</li> </ul>	<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>PTFE Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>ISOFLOW Technology</i> Internal equalization provides constant delivery pressure at high flows</li> <li>• <i>316L Stainless Steel Barstock Body</i> Smooth surface finish</li> <li>• <i>Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-15 To 0-250 PSIG (0-1 to 0-17 BAR)</i> Broad range of applications</li> <li>• <i>Pipe Away Relief Valve</i> Safely vents exhaust gases</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> Chrome-plated die-cast zinc</p> <p><i>Seat</i> PCTFE</p> <p><i>Filter</i> 40 micron 316L stainless steel mesh</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Diaphragm Seal</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2 1/2" (53mm) diameter stainless steel</p> <p><i>Ports</i> 1/2" FPT (inlet/outlet) 1/4" FPT (gauges/relief valve)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Cv</i> 0.2</p> <p><i>Weight (486-3301-000)</i> 5.06 lbs. (2.30 kg)</p>

**Installation Dimensions**



**Ordering Information**

486	A		B	C	D	-CON	Options
Series 486	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-15 PSIG 2: 0-40 PSIG 3: 0-120 PSIG 4: 0-200 PSIG 5: 0-250 PSIG	30"-0-30 PSIG 30"-0-60 PSIG 30"-0-200 PSIG 0-400 PSIG 0-400 PSIG	0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-400 PSIG 7: 0-200 PSIG 9: 0-600 PSIG	0: 1/2" FPT Port 1: 1/2" tube fitting 5: Needle valve 1/4" MPT P: 12mm tube fitting	0: Bare body  1: Standard assembly (PSIG/kPa gauges) 2: Standard assembly (BAR/PSIG gauges) 6: Mirror image (PSIG/kPa gauges) 7: Mirror image (BAR/PSIG gauges)	000: 1/2" FPT TF8: 1/2" tube M12: 12mm tube  CGA DIN 477 BS 341 and others available	B: Protocol alarm station (110/220 VAC) C: Protocol switchover station H: Protocol switchover station with alarm (110/220 VAC) M: Protocol station



## 492 Series

ultra high pressure, single stage, brass barstock regulator

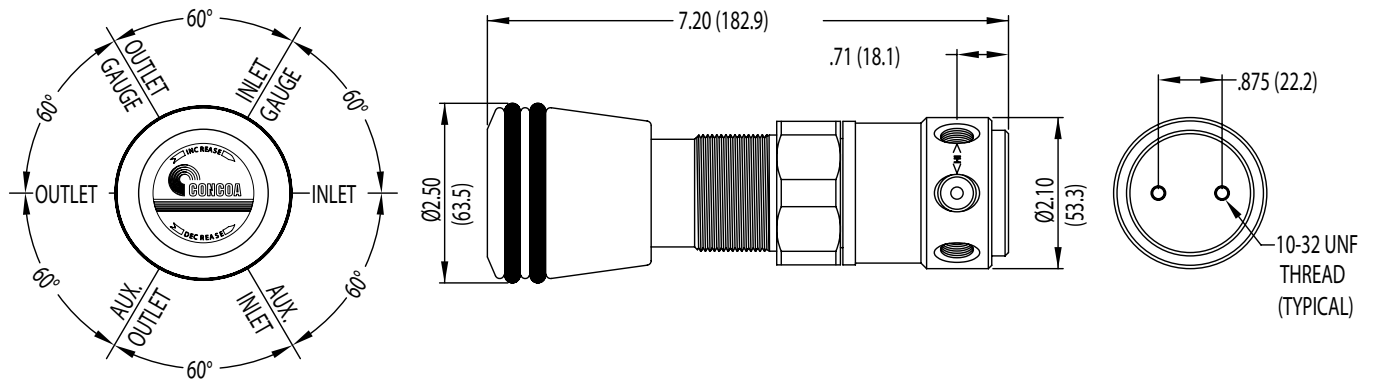


4

Description	Typical Applications
<p>The 492 Series regulators are intended for primary pressure control of non-corrosive gases at a maximum inlet pressure of 6000 PSIG (415 BAR).</p> <ul style="list-style-type: none"> <li>• Single Stage</li> <li>• Piston-Sensed</li> <li>• Ultra-High Pressure</li> <li>• Chrome-Plated Brass Barstock Body</li> </ul>	<ul style="list-style-type: none"> <li>• Airplane strut charging</li> <li>• Research and development laboratories</li> <li>• Chemical manufacturing</li> <li>• Aerospace hydraulic systems</li> <li>• Pharmaceutical manufacturing</li> <li>• Gauge calibration</li> </ul>

400 Series Advantage	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Large Piston Sensor</i> Safely control pressures to 6000 PSIG (415 BAR)</li> <li>• <i>CAPSULE® Seat</i> Increased serviceability and life</li> <li>• <i>Low Wetted Surface Area</i> Minimal purge requirements</li> <li>• <i>Field-Adjustable Pressure Limit</i> Safeguard downstream equipment</li> <li>• <i>Chrome-Plated Brass Barstock Body</i> Smooth surface finish</li> <li>• <i>Front and Rear Panel-Mountable</i> Versatile system configuration</li> <li>• <i>Pressure Ranges 0-750 to 0-6000 PSIG (0-50 to 0-415 BAR)</i> Broad range of applications</li> <li>• <i>Six Port Design</i> Flexible installation alternatives</li> </ul>	<p><i>Body</i> Chrome-plated brass barstock</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Seat</i> PCTFE (3000 and 4500 PSIG inlet) Arlon® (PEEK) (6000 PSIG inlet)</p> <p><i>Piston</i> Brass barstock</p> <p><i>Filter</i> 10 micron sintered bronze</p> <p><i>Internal Seals</i> Viton® (encapsulated)</p>	<p><i>Maximum Inlet Pressure</i> 6000 PSIG (420 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2½" diameter chrome-plated brass</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (492-4952-677)</i> 5.59 lbs. (2.54 kg)</p>

Installation Dimensions



4

Ordering Information

492	A		B		C	D	-CON	Options
Series 492	Outlet Pressure	Outlet Gauge	Inlet Maximum	Inlet Gauge	Outlet Assemblies	Assembly Gauges	Inlet Connections	Installed Options
	1: 0-750 PSIG 2: 0-1500 PSIG 3: 0-2500 PSIG 4: 0-4500* PSIG 5: 0-6000† PSIG 6: 0-3500* PSIG  *Not available with 3000 PSIG maximum inlet pressure  †Only available with 6000 PSIG maximum inlet pressure	0-1000 PSIG 0-4000 PSIG 0-4000 PSIG 0-6000 PSIG 0-10,000 PSIG 0-6000 PSIG	0: 6000 PSIG 3: 3000 PSIG 8: 5500 PSIG 9: 6000 PSIG	None 0-4000 PSIG 0-6000 PSIG 0-10,000 PSIG	0: 1/4" FPT 1: 1/4" MPT 2: 1/4" Tube fitting 5: Needle Valve 1/4" MPT 6: 1/8" Tube fitting 7: 3/8" Tube fitting F: Needle valve 1/4" tube fitting M: 6mm Tube fitting  Note: Outlet fittings and outlet valves are 316 stainless steel	0: Bare Body† 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges) 6: Mirror image (BAR/kPa gauges) 7: Mirror image (BAR/PSIG gauges)  †B must be 3, 8 or 9 (maximum pressure specified)	CGA DIN 477 BS 341 and others available	B: Protocol alarm station (110/220 VAC) C: Protocol switchover station H: Protocol switchover station with alarm (110/220 VAC) M: Protocol station Q: Protocol purge station*  *3000 PSIG (210 BAR) maximum inlet only valid if B=3

Related Options

Options	Order No.	Description
Panel mount kit	830 6483	To mount the regulator using bonnet threads. Material: Chrome-plated brass

## 493 Series

ultra high pressure, single stage, piston-sensed stainless steel barstock regulator

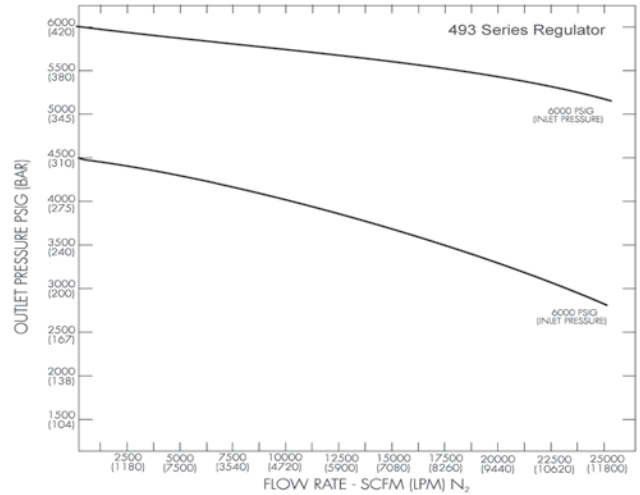
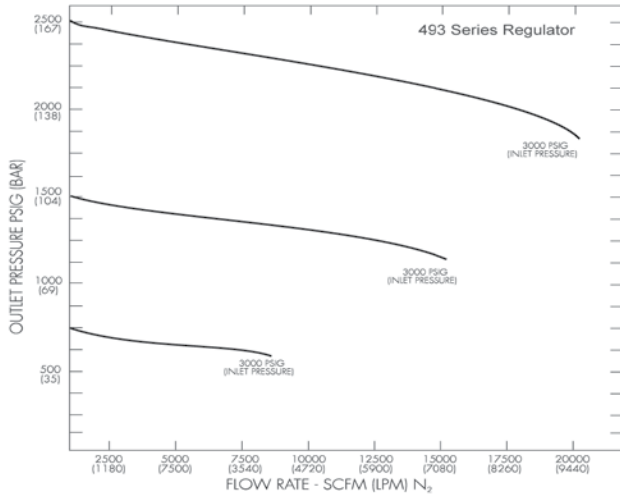


Description	Advanced Features	Typical Applications
The 493 Series regulators are intended for primary pressure control of non-corrosive gases at a maximum inlet pressure of 6000 PSIG.	<ul style="list-style-type: none"> <li>• <i>316L stainless steel barstock body</i> Smooth surface finish</li> <li>• <i>Front and rear panel mountable</i> Versatile system configuration</li> <li>• <i>Pressure ranges 0-750 to 0-6000 PSIG</i> Broad range of applications</li> <li>• <i>Six-port design</i> Flexible installation alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Airplane strut charging</i></li> <li>• <i>Research and development laboratories</i></li> <li>• <i>Chemical manufacturing</i></li> <li>• <i>Aerospace hydraulic systems</i></li> <li>• <i>Pharmaceutical manufacturing</i></li> <li>• <i>Gauge calibration</i></li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Large Piston sensor</i> Safely control pressures to 6000 PSIG</li> <li>• <i>Capsule® seat</i> Increased serviceability and life</li> <li>• <i>Low wetted surface area</i> Minimal purge requirements</li> <li>• <i>Field-adjustable pressure limit</i> Safeguard downstream equipment</li> </ul>	<p><i>Body</i> 316L stainless steel barstock</p> <p><i>Bonnet</i> 304 stainless steel</p> <p><i>Seat</i> PCTFE (3000 and 4500 PSIG inlet) Arlon® (PEEK) (6000 PSIG inlet)</p> <p><i>Piston</i> 316L stainless steel</p> <p><i>Filter</i> 10 micron stainless steel multi-layer wire mesh</p> <p><i>Internal Seals</i> Viton®</p>	<p><i>Maximum Inlet Pressure</i> 6000 PSIG (420 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2½" diameter stainless steel</p> <p><i>Ports</i> 1/4" FPT</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (493-5951-677)</i> 4.64 lbs. (2.10 kg)</p>

Flow Performance

4



Ordering Information and Configuration Options

493	A		B		C	D	-Inlet	Options
<b>Series 493</b>	<b>Outlet Pressure</b>	<b>Outlet Gauge</b>	<b>Inlet Maximum</b>	<b>Inlet Gauge</b>	<b>Outlet Assemblies</b>	<b>Assembly/ Gauges</b>	<b>Inlet Connections</b>	<b>Installed Options</b>
	1: 0-750 2: 0-1500 3: 0-2500 4: 0-4500* 5: 0-6000† 6: 0-3500*	0-1000 PSIG 0-4000 PSIG 0-4000 PSIG 0-6000 PSIG 0-10,000 PSIG 0-6000 PSIG	0: 6000 PSIG 3: 3000 PSIG 8: 5500 PSIG 9: 6000 PSIG	None 0-4000 PSIG 0-6000 PSIG 0-10,000 PSIG	0: ¼" FPT 1: ¼" MPT 2: ¼" Tube 5: Needle Valve ¼" MPT 6: ⅛" Tube 7: ⅜" Tube M: 6mm Tube	0: Bare Body* 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges)  *6000 PSIG maximum inlet only	CGA DIN 477 BS 341 and others available	A: Protocol Alarm Station (110V) B: Protocol Alarm Station (220V) C: Protocol Switchover Station G: Protocol Switchover Station with Alarm (110V) H: Protocol Switchover Station with Alarm (220V) M: Protocol Station
				• Panel Mount Kit (830-6483)				
		Related Options						

## 601 Series

high purity, two stage brass barstock regulator



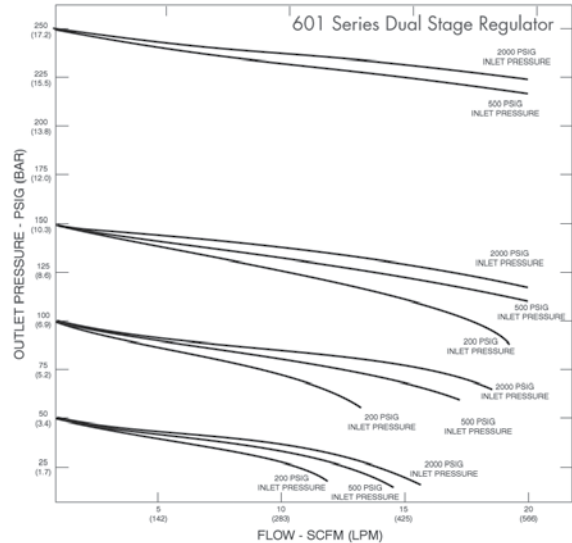
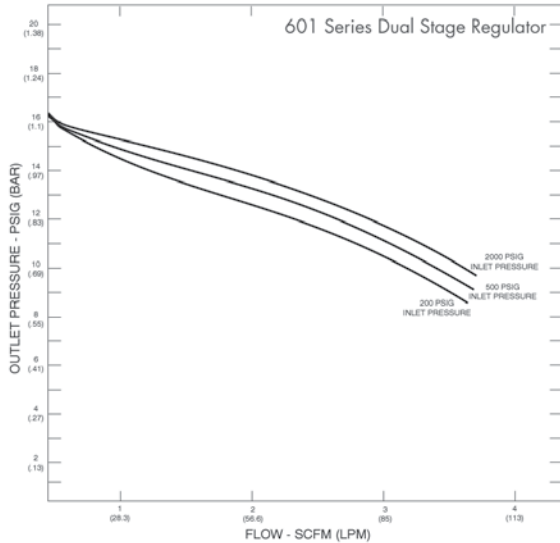
4

Description	Advanced Features	
<p>The 601 Series dual-stage regulator was designed with beam-mode quality in mind. The 601 offers M<sup>2</sup> technology that virtually eliminates atmospheric contamination during a cylinder change. Low level moisture and hydrocarbon contents yield a more stable emission and higher resonator efficiencies which makes the 601 Series the right choice.</p>	<ul style="list-style-type: none"> <li>• <i>Machined Brass Barstock Body</i> Smooth surface finish</li> <li>• <i>Low Wetted Surface Area</i> Minimal purge requirements</li> <li>• <i>Convuluted 316L Diaphragm</i> No inboard diffusion</li> <li>• <i>Optional Integral Purge</i> Eliminates atmospheric contamination</li> </ul>	<ul style="list-style-type: none"> <li>• <i>10-Micron Filtration in Both Stages</i> Reduces particle contamination</li> <li>• <i>Optional CGA Check Valve</i> Minimizes atmosphere exposure</li> <li>• <i>Optional Pressure Cycle Purge</i> Eliminates dead-space contaminate</li> <li>• <i>Capsule Seat</i> Increase serviceability and life</li> </ul>

Applications		
<p><i>Laser Pure Resonator Gases</i> Helium Nitrogen Carbon Dioxide</p> <p><i>Laser Mixed Resonator Gases</i> Three gas premix Four gas premix Five gas premix</p> <p><i>Laser Purging Gases</i> Zero Air Nitrogen</p> <p><i>Maintenance Gases</i> Nitrogen</p>	<p><i>Body</i> Machined brass barstock</p> <p><i>Bonnet</i> Chrome-plated die cast zin</p> <p><i>Seat</i> PTFE</p> <p><i>Filter</i> 10 micron sintered bronze</p> <p><i>Diaphragm</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3,000 PSIG (210 BAR) 4,500 PSIG (310 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" diameter dual scale</p> <p><i>Ports</i> ¼" FPT</p> <p><i>Cv</i> 0.1</p> <p><i>Weight (493-5951-677)</i> 4.8 lbs. (2.16 kg)</p>

**Flow Performance**

4



**Ordering Information and Configuration Options**

601	A	B	C	D	Inlet	Options	
<b>Series</b> 601	<b>Outlet Pressure</b> 1: 0-750 2: 0-1500 3: 0-2500 4: 0-4500* 5: 0-6000† 6: 0-3500*	<b>Outlet Gauge</b> 0-1000 PSIG 0-4000 PSIG 0-4000 PSIG 0-6000 PSIG 0-10,000 0-6000 PSIG	<b>Inlet Gauge</b> 0: None 3: 0-4000 PSI 8: 0-6000 PSI*	<b>Outlet Assemblies</b> 0: 1/4" FPT Port 1: 1/4" MPT 2: 1/4" Tube Fitting 6: 1/8" Tube Fitting 7: 3/8" Tube Fitting A: 3/8" BSP Right Hand Fitting M: 6mm Tube Fitting	<b>Assembly/Gauges</b> 0: Bare Body 1: Standard Assembly (PSI/kPa Gauges) 2: Standard Assembly (BAR/PSI Gauges) 3: Integral Purge (PSI/kPa Gauges) 4: Integral Purge (BAR/PSI Gauges) 5: Integral Purge with Fitting* (PSI/kPa Gauges) 6: Integral Purge with Fitting* (BAR/PSI Gauges)	<b>Inlet Connections</b> 000: 1/4" FPT TF2": 1/8" Tube TF4": 1/4" Tube TF6": 3/8" Tube M06: 6mm Tube  CGA DIN 477 BS 341 and others available	<b>Installed Options</b> A: Laser Gas Station Alarm (110V) C: Laser Gas Switchover Station M: Laser Gas Station N: Regulator CGA Check Valve Gland P: Inlet Pressure Cycle Purge
			*Alarm option not available			*Fitting matches outlet assembly	

## 3550 Series

economical, corrosive gas, high purity two stage regulator



4

Description	Advanced Features	Typical Applications
The Series 3550 two stage regulators are designed and constructed for use with reactive and corrosive gases and gas mixtures. While compact in design these regulators provide outstanding performance, comparable to most larger diaphragm competitive models. The monel® diaphragms, inlet filter, poppets and nozzle assemblies installed in a 316L stainless steel body create an economical, high purity, corrosive gas regulator.	<ul style="list-style-type: none"> <li>• Hastelloy® internal parts for added corrosion resistance.</li> <li>• High purity diffusion resistant, metal diaphragm construction on both stages.</li> <li>• Encapsulated seats on both stages.</li> <li>• Diffusion resistant, stainless steel diaphragm packless control valve installed on outlet as standard.</li> <li>• Designed to pass an inboard helium leak-rate test of 1x10<sup>-9</sup> cc per sec.</li> <li>• All parts ultrasonically cleaned prior to assembly.</li> </ul>	The 3550 Series regulators are ideal for critical pressure reduction applications involving higher pressure reactive and/or corrosive gases, where the precise control of pressure or flow is required. They are an excellent choice for use with gas mixtures of such components having a full cylinder pressure of 1000 psig or more.

Materials			Specifications	
<i>Body</i> 316L stainless steel	<i>Diaphragms</i> Elgiloy	<i>Gauges</i> stainless steel	<i>Max. Inlet Pressure</i> 3000 psig	<i>Inlet and Outlet</i> 1/4" NPT female
<i>Seat Assemblies</i> Hastelloy® C 22	<i>Diaphragm Seal</i> Teflon®	<i>Outlet Valve</i> 316 stainless steel	<i>Operating Temp. Range</i> -40 ° to +185 °F	<i>Delivery Pressure Rise</i> 0.02 psig max. per 100 psi inlet pressure decay
<i>Poppet springs</i> Hastelloy® C 276	<i>Inlet Filter</i> Hastelloy® C 276	<i>Outlet Connections</i> 316 stainless steel	<i>Flow Coefficient (Cv)</i> 0.08	
<i>Seats</i> 1st stage - Teflon® PFA 2nd stage - Teflon® PFA	<i>Bonnet</i> nickel plated aluminum			

Ordering Information * * *				Outlet Options	
Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig	P/N Suffix	
3551-25-CGA*	5-25	0-30	0-3000	No Outlet Valve	NV
3551-50-CGA*	5-50	0-100	0-3000	1/4" Compression Fitting	T4F
3551-100-CGA*	10-100	0-200	0-3000	1/8" Compression Fitting	T2F
				1/4" NPT Male	P4M
				1/4" Hose Barb	4HB

\*Specify CGA Connection Number when ordering.

\*\*\*For panel mounting bonnet add "PM" to base number (i.e., 3551PM-50-CGA).

**Warning:** A Purge assembly is strongly suggested when using the above regulators with any corrosive gas.

corrosion resistant, single stage, nickel plated brass regulator

**3470 Series**



4

Description	Advanced Features	Typical Applications
The series 3470 single stage regulators are specifically designed and constructed for use with difficult to handle gases, such as chlorine and hydrogen chloride. The large monel nozzle and Kel-F seat combined with the tied diaphragm assembly greatly reduces the possibility of failure due to creep so common in other corrosive gas regulators. A Teflon-lining on the stainless steel diaphragm forms a protective coating to extend regulator life.	<ul style="list-style-type: none"> <li>• Four built-in Kel-F seats provide convenient maintenance and long regulator life.</li> <li>• Large Teflon-lined 302 stainless steel diaphragm.</li> <li>• Monel valve with Teflon packing installed on outlet.</li> <li>• Captured vent bonnet provides for safe venting in the event of a diaphragm failure</li> </ul>	The 3470 Series regulators are ideal for use with many corrosive gases, such as chlorine, hydrogen chloride, boron trichloride, and boron trifluoride. They are also useful for controlling the pressure of high concentration gas mixtures containing these corrosive gas components.

Materials		Specifications
<i>Body</i> Electroless nickel-plated brass	<i>Diaphragm</i> Teflon-lined 302 stainless steel	<i>Max. Inlet Pressure</i> 3000 psig
<i>Nozzle</i> Monel	<i>Inlet Filter</i> Electroless nickel-plated sintered bronze	<i>Operating Temp. Range</i> 20° to +160°F
<i>Seat</i> Kel-F	<i>Seals</i> Teflon	<i>Body Inlet and Outlet</i> ¼" NPT female
		<i>Valve outlet</i> ¼" NPT male

Ordering Information			
Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig
3470-80-CGA*	5-80	0-100	0-3000
3470-160-CGA*	10-160	0-300	0-3000
3471-80-CGA*	5-80	0-100	0-1000
3471-160-CGA*	10-160	0-300	0-1000
3472-80-CGA*	5-80	0-100	0-300

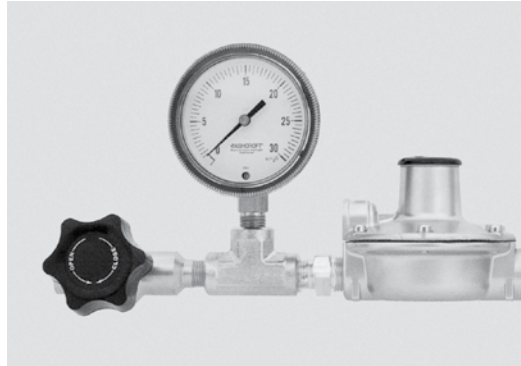
\*Specify CGA Connection Number when ordering.

Warning: A Purge assembly is strongly suggested when using the above regulators with any corrosive gas.



## Series 3700HP

single stage, low delivery pressure regulator



4

Description	Advanced Features	Typical Applications
<p>These regulators were designed to meet the needs of applications requiring reliable low-pressure control while maintaining gas purity. The low pressure stage has a large sensitive aluminum-faced neoprene diaphragm to provide delivery pressures as low as 2" of water.</p>	<ul style="list-style-type: none"> <li>Extremely low delivery pressures.</li> <li>Knob for adjusting delivery pressure.</li> <li>Aluminum faced diaphragm for high purity applications.</li> <li>Maximum inlet pressure 250 psig.</li> <li>Diaphragm packless valve on outlet is standard.</li> </ul>	<p>The Series 3700HP regulators are available in two delivery pressure ranges; 2-35" of water, and 0.5-5 psig. As a line regulator they have a maximum inlet pressure rating of 250 psig. Inlet and outlet connections are 1/4" NPT female. The series 3700HP has an aluminum faced natural rubber diaphragm to provide a diffusion resistant metal barrier for high purity gas applications.</p>

Materials	Specifications
<p><i>Body &amp; Bonnet</i> Zinc</p> <p><i>Seat</i> Nitrile</p> <p><i>Diaphragm</i> Aluminum-faced natural rubber</p>	<p><i>Internal parts</i> Steel, brass and zinc</p>

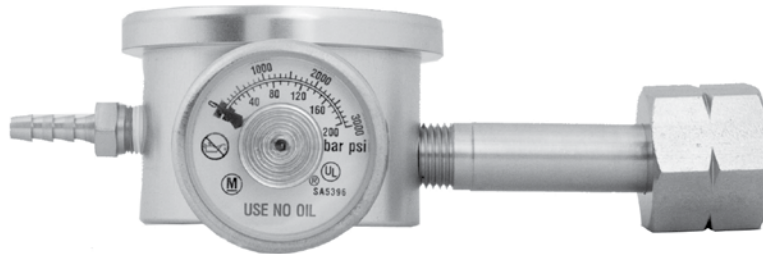
Ordering Information			
Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig
3701HP	2-25" water	0-30" water	none
3702HP	0.5-5 psig	0-10 psig	none
3703HP	0.8-2.7 psig	0-3 psig	none

Appropriate CGA connection for use with LP gas cylinders are ordered separately.

demand flow regulator

**Series 3950**

4



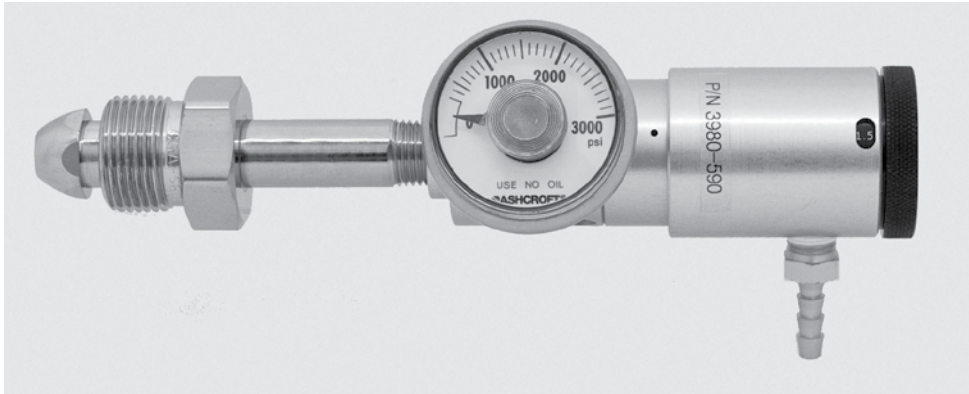
Description	Features
<p>This new single stage design using balanced valve stem technology is more sensitive than older two stage technologies providing a better performance even with high inlet pressures. This regulator is designed for use with instruments that use a pump to draw the calibration gas into the instrument. The 3950 series demand flow regulator provides the exact amount of calibration gas the instrument pump requires. This simple to use regulator makes calibration quick and easy by eliminating the need for sample bags, flowmeters, or special operator training.</p>	<ul style="list-style-type: none"> <li>• Precise delivery of calibration gas required by instrument pump.</li> <li>• New single stage balanced valve stem technology.</li> <li>• Simple easy to use operation.</li> <li>• Various cylinder connections available: C-10, CGA 600, other CGAs.</li> <li>• 40 micron inlet filter.</li> </ul>

Materials		Specifications
<b>3951</b>	<b>3952</b>	<p><i>Outlet hose barb</i> for 3/16" ID hose</p> <p><i>Flow</i> 0-3 slpm @ 3" of H2O vacuum</p> <p><i>Inlet pressure gauge</i> 0-3000 psig with GCA connection 0-1200 psig with C10 connection</p>
<p><i>Body</i> clear anodized aluminum</p> <p><i>Bonnet</i> clear anodized aluminum</p> <p><i>Diaphragm</i> Buna-N</p> <p><i>Main valve seat</i> Viton® and Teflon®</p> <p><i>Inlet Pressure gauge</i> stainless steel case with brass socket</p>	<p><i>Body</i> clear anodized aluminum</p> <p><i>Bonnet</i> clear anodized aluminum</p> <p><i>Diaphragm</i> Viton®</p> <p><i>Main valve seat</i> Viton® and Teflon®</p> <p><i>Inlet Pressure gauge</i> stainless steel case with stainless steel socket</p>	

Ordering Information	
Model	Description
3951-C10	Demand Flow Regulator with C-10 inlet connection
3951-600	Demand Flow Regulator with CGA 600 inlet connection
3951-CGA	Demand Flow Regulator with selected CGA connection
3952-C10	Demand Flow Regulator with C-10 inlet connection
3952-CGA	Demand Flow Regulator with selected CGA connection

## Series 3980

adjustable fixed flow regulator



Description	Features
<p>The 3980 series provides the control of the single fixed flow regulators with the advantage of being able to change flow rates as required for different applications. This regulator eliminates the need to have multiple regulators on-site. Commonly called the “click” regulator it has 12 flow positions, OFF, 0.3, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 5.0, 6.0, 7.0, and 8.0 slpm. There are models suitable for use with non-corrosive gases and mildly corrosive gases.</p>	<ul style="list-style-type: none"> <li>• 12 fixed flow settings.</li> <li>• 0-3000 psig cylinder pressure gauge.</li> <li>• Max. inlet pressure 3000 psig.</li> <li>• Available with standard C-10 (5/8”-18 UNF) or a standard CGA cylinder connection.</li> <li>• 3/16” hose barb outlet.</li> <li>• 40 micron inlet filter.</li> </ul>

Materials			
3981		3982	
<i>Body</i> clear anodized aluminum	<i>Main valve seat</i> Teflon®	<i>Body</i> clear anodized aluminum	<i>Main valve seat</i> Teflon®
<i>Piston</i> brass	<i>Piston Seals</i> Viton®	<i>Piston</i> stainless steel	<i>Piston Seals</i> Viton®
<i>Orifice Plate</i> ceramic	<i>Pressure gauges</i> SS case with brass socket	<i>Orifice Plate</i> ceramic	<i>Pressure gauges</i> stainless steel

Ordering Information	
Model	Description
3981	non-corrosive gas regulator with C-10 connection
3981-CGA*	non-corrosive gas regulator with standard CGA connection
3982	corrosive gas regulator with C-10 connection
3982-CGA*	corrosive gas regulator with standard CGA connection

\*Specify CGA connection when ordering.

fixed flow regulator for non-corrosive gases

**Series 3960**

**Description**

These compact regulators are designed to provide a constant fixed flow rate of non-corrosive gases and mixtures from disposable cylinders fitted with a C-10 connection. If required they can also be provided with a standard CGA connection for other types of cylinders.

**Features**

- Built-in on/off valve.
- Integral inlet and outlet connections provide convenient compact size.
- Outlet orifice and preset delivery pressure provide specific flow rate when on/off valve is opened.
- Pressure gauge monitors cylinder pressure.
- 40 micron inlet filter.



4

Materials	Specifications
<p><i>Body</i> nickel-plated brass</p> <p><i>Piston</i> brass</p> <p><i>Seat</i> Teflon®</p> <p><i>Seals</i> Viton®</p> <p><i>Gauge</i> stainless steel case, brass connection</p>	<p><i>Inlet pressure</i> 1000 psig max. with C10 3000 psig max. with CGA connection</p> <p><i>Operating temperature</i> 0° to 160°F</p> <p><i>Inlet connection</i> C-10 (5/8"-18 UNF)</p> <p><i>Outlet connection</i> 3/16" hose barb</p> <p><i>Cylinder pressure gauge</i> 1200 psig with C10 0-3000 psig with CGA connection</p>

**Ordering Information**

Model No.*	Pre-Set Flow Rate
3960-02	0.25 liters/min
3960-05	0.50 liters/min
3960-10	1.0 liters/min
3960-15	1.5 liters/min
3960-20	2.0 liters/min
3960-25	2.5 liters/min
3960-50	5.0 liters/min
3960-60	6.0 liters/min

\*If standard CGA connection is desired add CGA connection number to the model number, i.e. 3960-15-180.

## Series 3962

stainless steel fixed flow regulator for corrosive gases

4

### Description

These compact regulators are designed to provide a constant fixed flow rate of gas mixtures containing corrosive gas components from disposable cylinders fitted with a C-10 connection. If required they can also be provided with a standard CGA connection for other types of cylinders.

### Features

- Built-in on/off valve.
- Integral inlet and outlet connections provide convenient compact size.
- Outlet orifice and preset delivery pressure provide specific flow rate when on/off valve is opened.
- Pressure gauge monitors cylinder pressure.
- 40 micron inlet filter.



Materials	Specifications
<p><i>Body</i> stainless steel</p> <p><i>Piston</i> stainless steel</p> <p><i>Seat</i> Teflon®</p> <p><i>Seals</i> Viton®</p> <p><i>Gauge</i> stainless steel</p>	<p><i>Inlet pressure</i> 1000 psig max. with C10 3000 psig max. with CGA connection</p> <p><i>Operating temperature</i> 0° to 160°F</p> <p><i>Inlet connection</i> C-10 (5/8"-18 UNF)</p> <p><i>Outlet connection</i> 3/16" hose barb</p> <p><i>Cylinder pressure gauge</i> 1200 psig with C10 0-3000 psig with CGA connection</p>

### Ordering Information

Model No.*	Pre-Set Flow Rate
3962-02	0.25 liters/min
3962-05	0.50 liters/min
3962-10	1.0 liters/min
3962-15	1.5 liters/min
3962-20	2.0 liters/min
3962-25	2.5 liters/min
3962-50	5.0 liters/min
3962-60	6.0 liters/min

\*If standard CGA connection is desired add CGA connection number to the model number, i.e. 3962-15-180.

regulator for non-corrosive gases

**Series 3970**

**Description**

These compact regulators are designed to provide a constant fixed flow rate of non-corrosive gases and mixtures from disposable cylinders fitted with a CGA 600 outlet connection. They provide both pressure and flow control. When regulator is supplied without 1/4" flow control hose barb the 3970 is an adjustable pressure regulator.

**Features**

- Adjustable delivery pressure.
- Integral needle valve for shut-off and to control flow.
- Integral CGA 600 connection provides compactness and minimal loss of gas during installation and removal.
- 0-300 psig inlet pressure gauge to monitor cylinder pressure.



4

Materials	Specifications
<p><i>Body</i> aluminum</p> <p><i>Diaphragm</i> neoprene</p> <p><i>Seat</i> neoprene</p> <p><i>CGA gasket</i> composite cork</p> <p><i>Gauge</i> stainless steel case, brass connection</p>	<p><i>Inlet pressure</i> 300 psig max.</p> <p><i>Operating temperature</i> 0° to 160°F</p> <p><i>Inlet connection</i> CGA 600</p> <p><i>Outlet connection</i> 1/4" NPT female or 1/4" hose barb with flow control orifice</p> <p><i>Cylinder pressure gauge</i> 0-300 psig</p> <p><i>Cv</i> 0.04</p>

**Ordering Information**

Model No.*	Del. Press. Range psig	Outlet
3970	0-60	1/4" NPT female
3970HB	0-60	1/4" hose barb with flow control orifice

## Regulators for Portable Calibration Standards

4



### PR 150 Single Stage Calibration Gas Regulator

- Non-Corrosive Service
- Inlet Fitting: CGA-600
- Maximum Inlet Pressure: 500 PSIG
- Outlet Flow Settings: .25 LPM, .5 LPM, 1.0 LPM, 1.5 LPM
- Body: Brass Bar Stock
- Spring Housing Cap: Chrome Plated Brass Bar Stock
- Seat: Teflon<sup>®</sup>
- Piston: Brass
- Piston "O" Rings: Buna-N<sup>®</sup>



### PR 160 Single Stage Calibration Gas Regulator

- Non-Corrosive Service
- Inlet Fitting: 5/8" - 18 UNF (C-10)
- Maximum Inlet Pressure: 500 PSIG
- Outlet Flow Settings: .25 LPM, .5 LPM, 1.0 LPM, 1.5 LPM
- Body: Brass Bar Stock
- Spring Housing Cap: Chrome Plated Brass Bar Stock
- Seat: Teflon<sup>®</sup>
- Piston: Brass
- Piston "O" Rings: Buna-N<sup>®</sup>



### PR 190 Single Stage Click Style Regulator

- Corrosive and Non-Corrosive Service
- C-10, CGA-180
- Multi Flow Capability: .2 LPM, .3 LPM, .5 LPM, 1.0 LPM, 1.5 LPM, 2.5 LPM, 5.0 LPM, 6.0 LPM
- Body: Aluminum
- Spring Housing Cap: Aluminum
- Nozzle: Aluminum
- Seat: KEL-F
- Seals: Nylon
- Inboard Filter: 50 Micron Sintered Stainless Steel

**Wall Mount Protocol Station**

4

**Description**

The 529 Series Protocol Station is a regulator option designed for the convenient wall mounting of any CONCOA high purity regulator. Wall mounting of a regulator provides ease of use, prevents regulator damage and improves safety. The 529 Series Protocol Station is available in chrome-plated brass or 316 stainless steel construction as specified by the regulator series. This option comes complete with a 3 foot long flexible all stainless steel pigtail with armor casing.



Features	Specifications
<ul style="list-style-type: none"> <li>• <i>Plugged port in gas block</i> Facilitates purging</li> <li>• <i>Integral check valve at inlet</i> No internal contamination during cylinder change</li> <li>• <i>Bracket mounts</i> Attaches conveniently to any surface</li> </ul>	<p><i>Gas Block</i> 316 stainless steel, brass or chrome-plated brass barstock</p> <p><i>Inlet Connection</i> 316 stainless steel or brass barstock</p> <p><i>Check Valve "O" Ring</i> Viton®</p> <p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional 6000 PSIG (380 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Weight (Single Stage)</i> 3.1 lbs. (1.4 kg)</p> <p><i>Weight (Dual Stage)</i> 3.5 lbs. (1.6 kg)</p>

**Ordering Information and Configuration Options**

Stock Number	Description
Add letter "M" after any regulator stock number	For example, to order a 422-1331-580 with a Protocol Station wall mount, the stock number would be 422-1331-580M
529-0101-CON	Protocol Station for single stage brass regulators with 3000 PSIG max inlet pressure
529-0102-CON	Protocol Station for single stage chrome-plated brass regulators with 3000 PSIG max inlet pressure
529-0103-CON	Protocol Station for single stage 316L stainless steel regulators with 3000 PSIG max inlet pressure
529-0104-CON	Protocol Station for dual stage brass regulators with 3000 PSIG max inlet pressure
529-0105-CON	Protocol Station for dual stage chrome-plated brass regulators with 3000 PSIG max inlet pressure
529-0106-CON	Protocol Station for single stage 316L stainless steel regulators with 3000 PSIG max inlet pressure
529-0121-CON	Protocol Station for single stage brass regulators with 4500 PSIG max inlet pressure
529-0122-CON	Protocol Station for single stage chrome-plated brass regulators with 4500 PSIG max inlet pressure
529-0123-CON	Protocol Station for single stage 316L stainless steel regulators with 4500 PSIG max inlet pressure
529-0124-CON	Protocol Station for dual stage brass regulators with 4500 PSIG max inlet pressure
529-0125-CON	Protocol Station for dual stage chrome-plated regulators with 4500 PSIG max inlet pressure
529-0126-CON	Protocol Station for dual stage 316L stainless steel regulators with 4500 PSIG max inlet pressure
529-0133-CON	Protocol Station for single stage regulators with 6000 PSIG max inlet pressure



## Wall Mount Protocol Switchover Station

### Description

The 529 Series Protocol Purge Station combines all the safety and convenience of a standard Protocol Station with a feature to purge the hose and inlet side of the regulator.

The Protocol Purge Station allows isolation of the regulator inlet and is equipped with a purge valve at the 12 o'clock position on the mounting block with a 1/4" stainless steel tube fitting to safely pipe away the process gas during purging, if required. This station comes complete with mounting block and bracket, two 533 Series diaphragm valves and 3-foot (900 mm) all stainless steel hoses with armor casing. Available in brass, chrome-plated brass, or 316L stainless steel.



### Features

- **Regulator Isolation Valve**  
Isolates regulator inlet during purging process
- **Purge Valve with 1/4" Compression Tube Fitting**  
Allows complete and safe purging of the inlet
- **Integral Check Valve at Inlet of Hose**  
Minimizes purging during cylinder change
- **Bracket Mounts**  
Attaches conveniently to any surface
- **Connections**  
CGA, DIN 477, BS 341 and others available

### Specifications

<b>Protocol Tee</b> Brass, chrome-plated brass or 316L stainless steel barstock	<b>Maximum Inlet Pressure</b> 3500 PSIG (240 BAR)
<b>Flexible Hoses</b> 316L stainless steel inner core Monel® innercore for oxygen service	<b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)
<b>Inlet Connection</b> 316L stainless steel or brass barstock	<b>Weight (Single Stage)</b> 3.6 lbs. (1.4 kg)
<b>Check Valve "O" Ring</b> Viton® (or neoprene for ammonia)	<b>Weight (Dual Stage)</b> 4.0 lbs. (1.6 kg)
<b>Bracket</b> 304 Stainless Steel	

### Ordering Information and Configuration Options

Stock Number	Description
Add letter "Q" after any regulator stock number To order separately: 529 0171-CON 529 0172-CON 529 0173-CON 529 0174-CON 529 0175-CON 529 0176-CON	For example, to order a 422 1331-580 with a protocol purge station, the order number would be 422 1331-580Q  Protocol purge station for single stage brass regulators 3500 PSIG (240 BAR) Protocol purge station for single stage chrome-plated brass regulator 3500 PSIG (240 BAR) Protocol purge station for single stage 316L stainless steel regulators 3500 PSIG (240 BAR) Protocol purge station for dual stage brass regulators 3500 PSIG (240 BAR) Protocol purge station for dual stage chrome-plated brass regulators 3500 PSIG (240 BAR) Protocol purge station for dual stage 316L stainless steel regulators 3500 PSIG (240 BAR)

**Flexible Hoses**

4

**Description**

The 529 Series flexible hoses are intended for use in systems where a flexible connection is preferable to the use of rigid tubing. Most commonly, flexible hoses are used as hoses to connect cylinders to wall-mounted regulators or manifold headers.



Materials	Specifications
Minimum Bend Radius Temperature Range Oxygen Service	4.0" (101.6mm) -450°F to 1500°F (-265°C to 815°C) Cleaned to CGA G4.1 specifications

**Ordering Information**

Order No.	Inner Core	Connection	Max Pressure	Length
529 0029-CGA*	316L stainless steel	1/4" MPT x 316L stainless steel CON (with check valve)	3850 PSIG (265 BAR)	3 ft (900mm)
529 0031-CGA*	316L stainless steel	1/4" MPT x brass CON (with check valve)	3850 PSIG (265 BAR)	3 ft (900mm)
529 0055-CGA*	316L stainless steel	1/4" MPT x brass CON (with check valve)	3850 PSIG (265 BAR)	6 ft (1800mm)
529 0056-CGA*	316L stainless steel	1/4" MPT x 316L stainless steel CON (with check valve)	3850 PSIG (265 BAR)	6 ft (1800mm)
529 0071-CGA*	316L stainless steel	1/4" MPT x brass CON (with check valve)	3850 PSIG (265 BAR)	2 ft (600mm)
529 0070-CGA*	316L stainless steel	1/4" MPT x 316L stainless steel CON (with check valve)	3850 PSIG (265 BAR)	2 ft (600mm)
529 0058-CGA	316L stainless steel	1/4" MPT x brass CON (with check valve)	4500 PSIG (300 BAR)	3 ft (900mm)
529 0059-CGA	316L stainless steel	1/4" MPT x 316L stainless steel CON (with check valve)	4500 PSIG (300 BAR)	3 ft (900mm)
529 0064-CGA	PTFE	1/4" MPT x 316L stainless steel CON (with check valve)	6000 PSIG (415 BAR)	3 ft (900mm)

\*Inner core Monel<sup>®</sup> with CGA 540, 280, 296

**Transfer Hoses**

**Description**

Specifically designed for the transfer of cryogenic gases, these all stainless hoses offer complete flexibility, durability and fast cool-down. Machined end connections and a long collar extend the hose life, and low profile corrugations provide faster filling, lower pressure drop and less product loss. Full armor casing protects the hose from abrasion and damage.



Materials	Specifications
Minimum Bend Radius Temperature Range Oxygen Service	6" (152.4mm) -450°F to 1500°F (-265°C to 815°C) Cleaned to CGA G4.1 specifications

**Ordering Information**

Order No.	Inner Core	Connection	Max Pressure	Length
529 0245	316L stainless steel	316L stainless steel CGA 440	1000 PSIG (70 BAR)	4 ft (1200 mm)
529 0246	316L stainless steel	316L stainless steel CGA 440	1000 PSIG (70 BAR)	5 ft (1500 mm)
529 0247	316L stainless steel	316L stainless steel CGA 440	1000 PSIG (70 BAR)	6 ft (1800 mm)
529 0250	316L stainless steel	316L stainless steel CGA 295	1000 PSIG (70 BAR)	4 ft (1200 mm)
529 0251	316L stainless steel	316L stainless steel CGA 295	1000 PSIG (70 BAR)	5 ft (1500 mm)
529 0252	316L stainless steel	316L stainless steel CGA 295	1000 PSIG (70 BAR)	6 ft (1800 mm)

## 542 Series

high flow backup

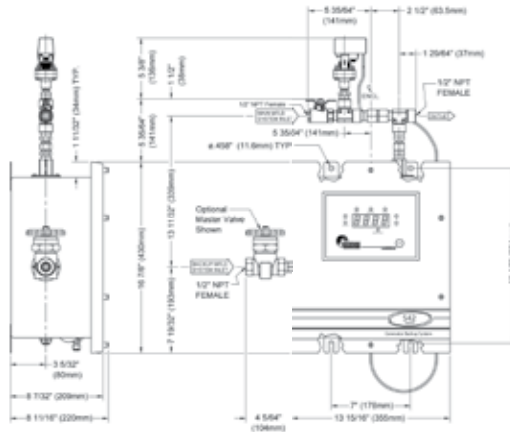


4

Description	Typical Applications
<p>The 542 Series High Flow Back-Up is designed to provide a "smart" reserve supply to high flow gas generators or bulk supply systems. If there is a loss of power, or if the gas generator or bulk supply system cannot provide sufficient gas, the 542 Series will automatically activate the reserve supply to supply gas without interruption. The unique feature of the 542 is that these functions are controlled by an on board micro-processor. In addition to the on board systems, the 542 is equipped with CONCOA's new I-Link™ Web server technology allowing for remote monitoring and control functions. Together, these advanced systems continually monitor pipeline pressure and reserves and can be programmed to engage at a specific pressure. The 542 is available for nitrogen, air, helium, carbon dioxide, nitrous oxide, oxygen, or argon in high purity barstock brass construction.</p>	<ul style="list-style-type: none"> <li>• Bulk or microbulk backup supply</li> <li>• Air, Nitrogen, or Oxygen generator backup</li> <li>• Gas chromatography, flame ionization detector, and mass spectrometer backup</li> <li>• Critical laboratory gas reserve</li> <li>• Incubator Carbon Dioxide backup supply</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Programmable Reserve Activation Pressure</i> User sets the pressure at which the backup engages</li> <li>• <i>Programmable Reserve Low Alarm Pressure</i> User sets the low reserve alarm point</li> <li>• <i>On Board I-Link™ Web Server and Remote Monitoring Software</i> Enables for real-time online system monitoring</li> <li>• <i>High Purity Components</i> Use in high purity systems</li> <li>• <i>High Flow Capacity</i> High flow building or facility systems</li> <li>• <i>Check Valves on Both Generator and Reserve</i> Prevents back flow to the generator or reserve cylinder</li> </ul>	<p><i>Regulator Body</i> Brass barstock</p> <p><i>Bonnet</i> Chrome-plated die-cast zinc</p> <p><i>Seat</i> PCTFE</p> <p><i>Filter</i> Patented 40 micron 316 mesh</p> <p><i>Diaphragms and Pigtails</i> 316L stainless steel</p> <p><i>CGA Connections</i> Brass with check valve</p> <p><i>Check Valve Seat</i> PTFE or Viton®</p> <p><i>Enclosure</i> NEMA 12 Powder coated steel</p>	<p><i>Maximum Primary Inlet Pressure</i> 0-120 PSIG (0-8 BAR) 0-250 PSIG (0-17 BAR)</p> <p><i>Temperature Range</i> 0°F to 140°F (-18°C to 60°C)</p> <p><i>Pressure Display</i> Large digital display</p> <p><i>Status Display</i> Multi-color LEDs</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Adjustable Pressure Range</i> 50-250 PSIG (3.5-17 BAR)</p> <p><i>Cv</i> 0.1</p> <p><i>Weight</i> 45 lbs. (20.45 kg)</p>

**Installation Dimensions**



4

**Ordering Information**

542	A	B	C	D	-CON	Stations
Series 542	Delivery Pressure	Inlet Options	Internal Buzzer Audible Alarm	Voltage/Web Server Assembly Options	Gas Service Cylinder Connections	
	3: 0-120 PSIG (0-8 BAR)	0: 1/2" FPT	0: Without alarm	2: 120 VAC / without web server	-000: No cylinder connection	0: No hoses
	5: 0-250 PSIG (0-17 BAR)	1: Master valve 1/2" FPT	1: With alarm	3: 240 VAC / without web server	-296: Oxygen mixture >23.5%	1: 1 station
		2: MicroManifold without hoses		4: 120 VAC / with web server	-320: Carbon Dioxide	2: 2 stations
		3: MicroManifold with 36" (900mm) stainless flexible hoses		5: 240 VAC / with web server	-326: Nitrous Oxide	3: 3 stations
		4: MicroManifold with 72" (1800mm) stainless flexible hoses			-346: Breathable air	4: 4 stations
		5: Master valve with MicroManifold without hoses			-540: Oxygen	5: 5 stations
		6: Master valve with MicroManifold with 36" (900mm) stainless flexible hoses			-580: Inert (Argon, Helium, Nitrogen)	6: 6 stations
		7: Master valve with MicroManifold with 72" (1800mm) stainless flexible hoses			-590: Synthetic air (dry, zero grade, ultra zero grade)	7: 7 stations
		C: High flow manifold, single row, without hoses			DIN 477 BS 341 and others available	8: 8 stations
		D: High flow manifold, single row, with 36" (900mm) stainless flexible hoses				
		E: High flow manifold, single row, with 72" (1800mm) stainless flexible hoses				
		F: High flow manifold, dual row, without hoses				
		G: High flow manifold, dual row, with 36" (900mm) stainless flexible hoses				
		H: High flow manifold, dual row, with 72" (1800mm) stainless flexible hoses				

## Protocol Switchover Alarm

### Description

The 529 Series Protocol Switchover Alarm combines all of the features of the Protocol Switchover Station with the added security of a remote alarm system. The Protocol Switchover Alarm will provide an audio/visible warning when a cylinder is nearly depleted. The system comes complete with Protocol Switchover Station, two 3-foot all stainless steel pigtails with armor casing, two valves (diaphragm, 3,000 PSIG or needle 4,500 or 6,000 PSIG) and remote alarm.



### Features

- *Plugged port in gas block*  
Facilitates purging
- *Integral check valve at inlet*  
No internal contamination during cylinder change
- *Bracket mounts*  
Attaches conveniently to any surface
- *Pressure Switch Gauge*  
Provides visible warning of cylinder depletion
- *Remote Alarm*  
Provides audible and visible warning of cylinder depletion

### Specifications

<i>Protocol Tee</i> Brass or 316 stainless steel barstock	<i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional 6000 PSIG (380 BAR) optional
<i>Flexible Pigtails</i> 316 stainless steel barstock Monel innercore for oxygen service	<i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)
<i>Inlet Connection</i> 316 stainless steel or brass barstock	<i>Weight (Single Stage)</i> 4.4 lbs. (2 kg)
<i>Check Valve "O" Ring</i> Viton®	<i>Weight (Dual Stage)</i> 4.8 lbs. (2.2 kg)
<i>Bracket</i> 304 Stainless Steel	<i>Intrinsic Safety Barriers</i> Required for flammable gas service or for use in hazardous environments

### Ordering Information and Configuration Options

Stock Number	Description
Add letter "G" after any regulator stock number Add letter "H" after any regulator stock number To order separately:	For example, to order a 422-1331-580 with a 110V Protocol Switchover Alarm, the stock number would be 422-1331-580G For example, to order a 422-1331-580 with a 220V Protocol Switchover Alarm, the stock number would be 422-1331-580H
529-0151-CONG	110V Protocol Switchover Alarm for brass regulators with max inlet 600 PSIG
529-0152-CONG	110V Protocol Switchover Alarm for chrome-plated brass regulators with max inlet 600 PSIG
529-0153-CONG	110V Protocol Switchover Alarm for 316L stainless steel regulators with max inlet 600 PSIG
529-0154-CONG	110V Protocol Switchover Alarm for brass regulators with max inlet 3,000 PSIG
529-0155-CONG	110V Protocol Switchover Alarm for chrome-plated brass regulators with max inlet 3,000 PSIG
529-0156-CONG	110V Protocol Switchover Alarm for 316L stainless steel regulators with max inlet 3,000 PSIG
529-0157-CONG	110V Protocol Switchover Alarm for brass regulators with max inlet 4,500 PSIG
529-0158-CONG	110V Protocol Switchover Alarm for chrome-plated brass regulators with max inlet 4,500 PSIG
529-0159-CONG	110V Protocol Switchover Alarm for 316L stainless steel regulators with max inlet 4,500 PSIG
529-0160-CONG	110V Protocol Switchover Alarm for 316L stainless steel regulators with max inlet 6,000 PSIG
	<i>For 220V Protocol Switchover Alarm replace "G" after Part Number with "H"</i>

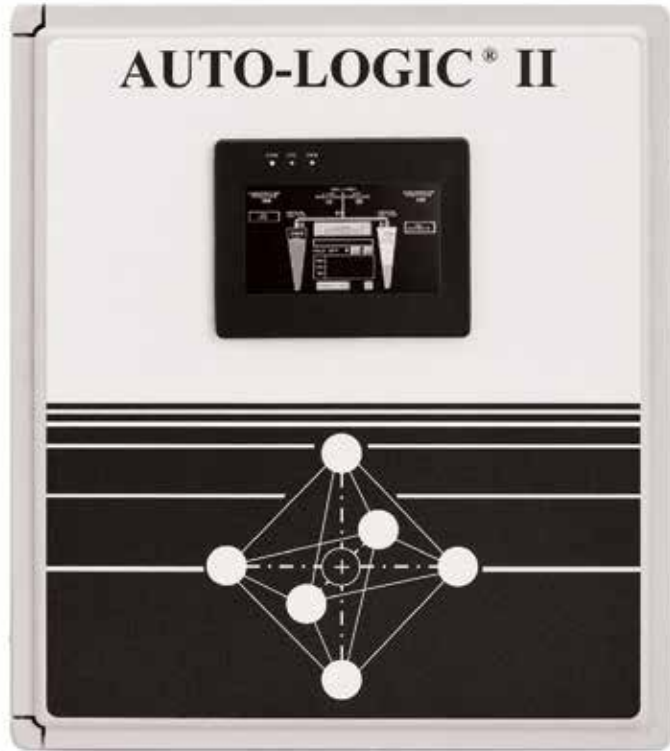
fully automatic electronic touch screen changeover manifold **AUTO-LOGIC<sup>®</sup> II**

4

**Description**

This advanced electronically operated 918 Series AUTO-LOGIC II changeover manifold is fully automatic and provides the user with simple, intuitive operation via a color touch screen. Users can switch from high pressure cylinders on both sides, 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 to change cylinders as necessary. 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. The AUTO-LOGIC II capabilities provide customers with a changeover system that suits their current operation and future expanded requirements without having to buy another system.

The 918TS is available with either 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.

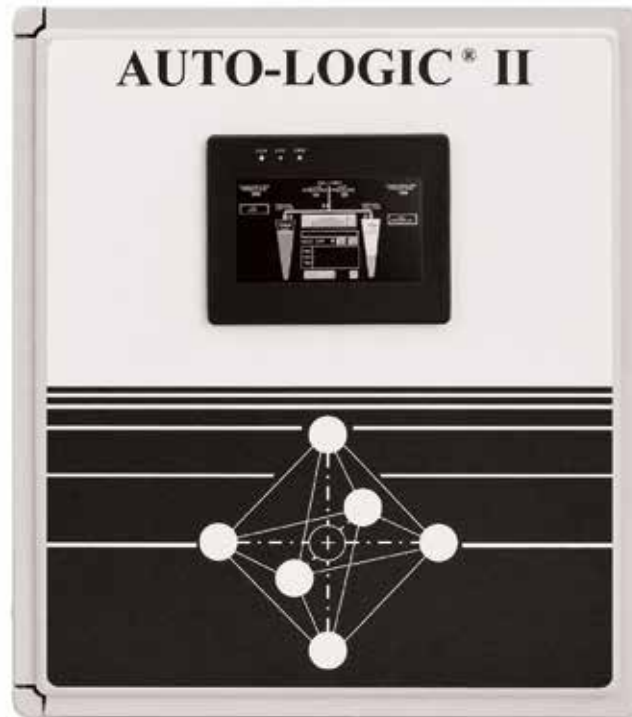


Features	Specifications
<ul style="list-style-type: none"> <li>• Fully automatic, simple, hassle free operation via a color touch screen</li> <li>• Constant digital and graphic gas supplies on both sides</li> <li>• Delivery pressure monitor displays any unusual variances</li> <li>• High and low adjustable delivery pressure alarm settings</li> <li>• Designed for high purity gas service</li> <li>• May be used with any type gas source</li> <li>• "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</li> <li>• "Gas-Check" feature ensures efficient use of gas supplies when cryogenic containers are in service</li> <li>• Built-in audio and visual alarm</li> <li>• External dry contacts provided to activate optional equipment or remote alarms</li> <li>• System housed in NEMA 4X box</li> <li>• Available in either brass or stainless steel construction</li> </ul>	<p><i>Max Inlet Pressure</i> 3000 psig</p> <p><i>Power required</i> 120 VAC/60Hz</p> <p><i>Inlet and Outlet Connections</i> 1/4" NPT female</p>

## AUTO-LOGIC® II

fully automatic electronic touch screen changeover manifold

4



### Ordering Information and Configuration Options

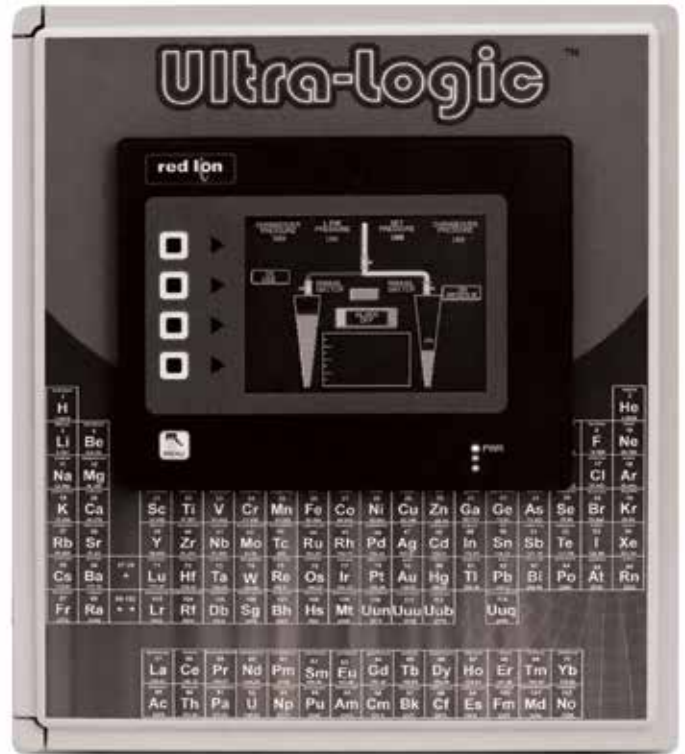
Model	Description	Delivery Pressure
918TS-1-200	brass electronic high purity changeover manifold	25-200 psig
918TS-2-200	stainless steel electronic high purity changeover manifold	25-200 psig
Options		
912-AVA audio/visual alarm module for remote alarm		
AVD-45B auto dialer		
914/918-HUB - this hub device allows for multiple dry contact connections to operate auxillary devices		
Pigtails for 918TS Changeover Manifolds (2 per set)		
For Brass Manifolds		
918-FPB601-Y-CGA*	two flexible Teflon lined stainless steel braided pigtails with brass fittings and no check valves	
918-FPB601-Y-CV-CGA*	two flexible Teflon lined stainless steel braided pigtails with brass fittings and check valves	
918-FPB604-Y-CGA*	two flexible all stainless steel braided pigtails with brass fittings and no check valves	
918-FPB604-Y-CV-CGA*	two flexible all stainless steel braided pigtails with brass fittings and check valves	
For Stainless Steel Manifolds		
918-FP604-Y-CGA*	two flexible all stainless steel braided pigtails without check valves	
918-FP604-Y-CV-CGA*	two flexible all stainless steel braided pigtails with check valves	

\* Specify CGA connection when ordering  
Y = pigtail length in feet

advanced fully automatic electronic touch screen  
changeover manifold - Series 919TS **ULTRA-LOGIC**

4

Description
<p>The 919 Series Ultra-Logic changeover manifold is an advanced version of the AUTO-LOGIC II and provides the user with simple, intuitive operation via a color touch screen. Users can switch from high pressure cylinders on both sides, 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. 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.</p> <p>The additional Ultra-Logic capabilities provide customers with a changeover system that suits their current operation and future expanded requirements without having to buy another system.</p> <p>The 919 TS is available with either 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.</p>



Features	Specifications
<ul style="list-style-type: none"> <li>• <b>Can be controlled via network</b></li> <li>• <b>Provides full data logging capability for all functions to aid in 21CFR11 compliance</b></li> <li>• <b>Operating parameters are password protected for multiple users</b></li> <li>• <b>919TSP provides automatic purging to ensure gas purity on cylinder change outs</b></li> </ul> <p><i>Plus these features, also available with the Auto-Logic® II</i></p> <ul style="list-style-type: none"> <li>• Fully automatic, simple, hassle free operation via a large color touch screen</li> <li>• Constant digital and graphic gas supplies on both sides</li> <li>• Delivery pressure monitor displays any unusual variances</li> <li>• High and low adjustable delivery pressure alarm settings</li> <li>• Designed for high purity gas service</li> <li>• May be used with any type gas source</li> <li>• “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</li> <li>• “Gas-Check” feature ensures efficient use of gas supplies when cryogenic containers are in service</li> <li>• Built-in audio and visual alarm</li> <li>• External dry contacts provided to activate optional equipment or remote alarms</li> <li>• System housed in NEMA 4X box</li> <li>• Available in either brass or stainless steel construction</li> </ul>	<p><i>Max Inlet Pressure</i> 3000 psig</p> <p><i>Power required</i> 120 VAC/60Hz</p> <p><i>Inlet and Outlet Connections</i> 1/4” NPT female</p>



## ULTRA-LOGIC™

advanced fully automatic electronic touch screen  
changeover manifold - Series 919TS

4



### Ordering Information and Configuration Options

Model	Description	Delivery Pressure
919TS-1-200	brass electronic high purity changeover manifold	25-200 psig
919TSP-1-200	brass electronic high purity changeover manifold with automatic purging	25-200 psig
919TS-2-200	stainless steel electronic high purity changeover manifold	25-200 psig
919TSP-2-200	stainless steel electronic high purity changeover manifold with automatic purging	25-200 psig
Options		
912-AVA audio/visual alarm module for remote alarm AVD-45B auto dialer		
Pigtails for 919TS Changeover Manifolds (2 per set)		
For Brass Manifolds		
919-FPB601-Y-CGA*	two flexible Teflon lined stainless steel braided pigtails with brass fittings and no check valves	
919-FPB601-Y-CV-CGA*	two flexible Teflon lined stainless steel braided pigtails with brass fittings and check valves	
919-FPB604-Y-CGA*	two flexible all stainless steel braided pigtails with brass fittings and no check valves	
919-FPB604-Y-CV-CGA*	two flexible all stainless steel braided pigtails with brass fittings and check valves	
For Stainless Steel Manifolds		
919-FP604-Y-CGA*	two flexible all stainless steel braided pigtails without check valves	
919-FP604-Y-CV-CGA*	two flexible all stainless steel braided pigtails with check valves	

\* Specify CGA connection when ordering  
Y = pigtail length in feet

automatic switchover system

**522 Series**

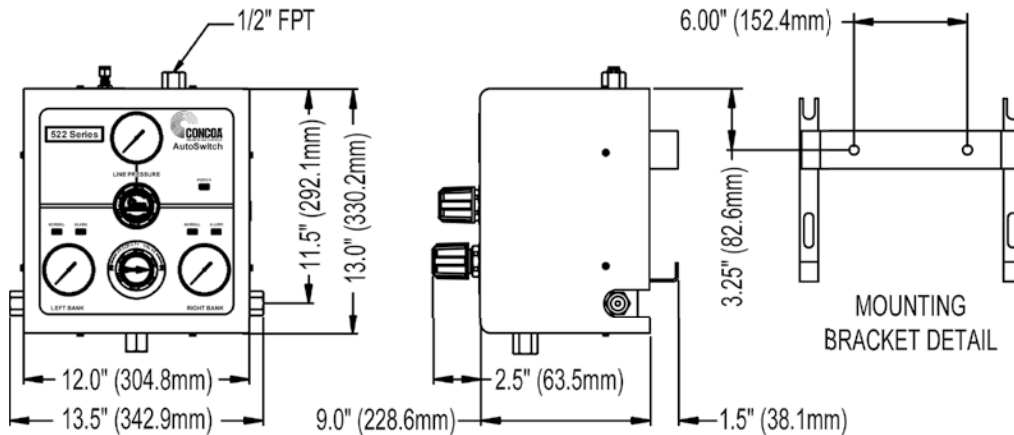


4

Description	Advanced Features
<p>The 522 Series AutoSwitch is a continuous gas delivery system for high purity gas service, typically in the laboratory or process plant, that automatically changes cylinder or bank priority from the primary source to a reserve supply without transmitting pressure fluctuations to the use line. Optional internal pressure switches, warning lights, and separate remote alarm indicate low bank pressure and the need to change depleted cylinders.</p>	<ul style="list-style-type: none"> <li>• High purity non-corrosive gas supply</li> <li>• Gas chromatograph carrier and support gases</li> <li>• Hydrogen and other flammable gases</li> <li>• Pure or mix process gas supply</li> <li>• Biotech, pharmaceutical gas systems</li> <li>• Central gas supply system for laboratory, research or process plants</li> </ul>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>400 Series Brass Components</i> CAPSULE<sup>®</sup> seat</li> <li>• <i>Metal to Metal Seals</i> No possibility of gas contamination</li> <li>• <i>Integral Line Regulator</i> Stable line pressure during change over</li> <li>• <i>Variable Line Pressure</i> Line pressure changeable on site</li> <li>• <i>User-Friendly Priority Valve</i> One knob switches cylinder priority</li> <li>• <i>Integral Manifold System</i> Easy installation</li> <li>• <i>Optional Alarms</i> Advantium 16 monitors up to 8 systems Advantium 2 PLUS monitors 1 system</li> <li>• <i>Intrinsic Safety Barriers</i> For use with flammable gases or in hazardous areas (Class 1, Div. 1, Group A, B, C, or D)</li> </ul>	<p><i>Priority Valve</i> Brass barstock</p> <p><i>Line Regulator</i> Brass barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Enclosure</i> Acrylic powder-coated steel</p> <p><i>Tubing and Fittings</i> 316L stainless steel</p> <p><i>Internal Seats and Seals</i> PTFE</p> <p><i>Seats</i> PTFE (line regulator) PCTFE (inlet regulators)</p> <p><i>Pressure Gauges</i> Brass, Bronze and Stainless Steel</p> <p><i>Pressure Switches (optional)</i> Field-settable on inlet gauge, dry contact (opens below set point)</p> <p><i>Check Valves</i> Brass with Viton<sup>®</sup> seals</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Maximum Flow at 100 PSIG (7 BAR)</i> 600 scfh (283 LPM)</p> <p><i>Cv</i> 0.1</p> <p><i>Inlet Connection</i> 1/2" FPT</p> <p><i>Outlet Connection</i> 1/4" stainless steel compression tube</p> <p><i>Relief Valve Outlet</i> 1/2" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Weight</i> 40 lbs. (18 kg)</p>

## Installation Dimensions



## Ordering Information and Configuration Options

522	A	B	C	D	-CON	Options
Series 522	Outlet Pressure	Inlet Connection	Cylinders/Side	Assembly	Hose	
	2: 0-50 PSIG (0-3.5 BAR)	0: 1/2" FPT	0: No inlet connection**	1: Without alarm capability	Please specify inlet connection (if applicable)	C: Compact manifold extensions
	3: 0-120 PSIG (0-8 BAR)	1: Brass manifolds with 36" (900mm) stainless steel flexible hoses at each station	1: One cylinder	4: With alarm capability* (alarm sold separately)		
	4: 0-200 PSIG (0-14 BAR)	3: Diaphragm valves with 36" (900mm) stainless steel flexible hoses*	2: Two cylinders	<i>*Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.</i>	CGA DIN 477 BS 341 and others available	
	5: 0-250 PSIG (0-17 BAR)	4: Brass manifolds with 24" (600mm) stainless steel flexible hoses at each station	3: Three cylinders			
	7: 0-150 PSIG (0-10 BAR)	5: Chrome-plated brass manifolds with 36" (900mm) stainless steel flexible hoses at each station	4: Four cylinders			
		6: 1/2" FPT with captured vent	5: Five cylinders			
		7: Chrome-plated brass manifolds with 24" (600mm) stainless steel flexible hoses at each station	6: Six cylinders			
		9: Diaphragm valves with 72" (1800mm) stainless steel hoses*	7: Seven cylinders			
		<i>*One or two cylinders/side only</i>	8: Eight cylinders			
			9: Nine cylinders			
			0: Ten cylinders**			
			A: Eleven cylinders			
			B: Twelve cylinders			
			C: Thirteen cylinders			
			D: Fourteen cylinders			
			E: Fifteen cylinders			
			** If manifold option is selected in B, 0 = ten cylinders			

corrosion resistant, automatic switchover system **523 Series**

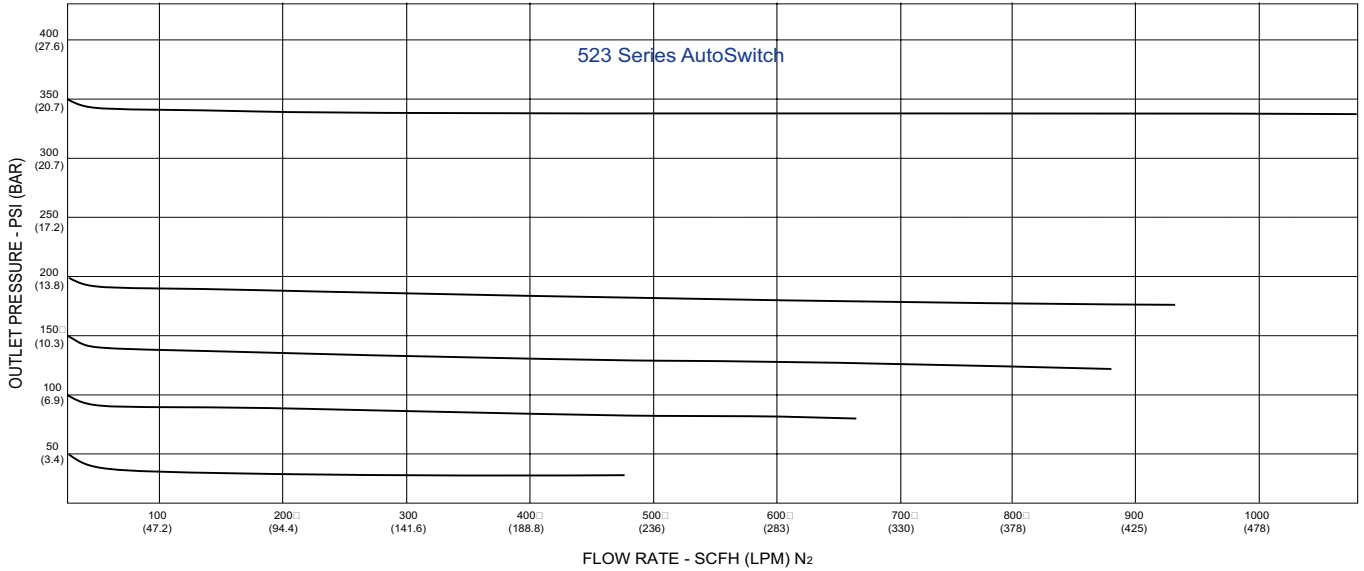
4



Description	Advanced Features	Typical Applications
<p>The 523 Series AutoSwitch is a continuous gas delivery system for ultra-high purity or corrosive gas service, typically in the laboratory or process plant, that automatically changes cylinder or bank priority from primary source to a reserve supply without transmitting pressure fluctuations to the use line. Internal pressure switches, warning lights, and remote alarm indicate low bank pressure and the need to change depleted cylinders.</p>	<ul style="list-style-type: none"> <li>• 400 Series 316L Stainless Components Capsule<sup>®</sup> seat</li> <li>• Metal to metal seals No possibility of gas contamination</li> <li>• Integral Line Regulator Stable line pressure during change over</li> </ul>	<ul style="list-style-type: none"> <li>• Variable Line Pressure Line pressure changeable on site</li> <li>• User-Friendly Priority Valve One knob switches cylinder priority</li> <li>• Integral Manifold System Easy installation</li> </ul>

Features	Materials	Specifications
	<p><i>Priority Valve</i> 316L stainless steel barstock</p> <p><i>Line Regulator</i> 316L stainless steel barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Enclosure</i> Acrylic powder-coated steel</p> <p><i>Tubing and Fittings</i> 316 stainless steel</p> <p><i>Internal Seats and Seals</i> PTFE</p> <p><i>Pressure Gauges and Switches</i> 316 stainless steel</p> <p><i>Check Valves</i> 316 stainless steel with Viton<sup>®</sup> seal</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Maximum Flow (100 PSIG)</i> 600 scfh (283 lpm)</p> <p><i>Inlet Connection</i> ½" FPT</p> <p><i>Outlet Connection</i> ¼" stainless steel compression tube</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Weight</i> 40 lbs. (18 kg)</p>

## Flow Performance



## Ordering Information and Configuration Options

523	A	B	C	D	-Inlet
Series 523	<b>Outlet Pressure</b> 2: 0-50 PSIG 3: 0-100 PSIG 4: 0-200 PSIG 5: 0-350 PSIG 7: 0-150 PSIG	<b>Inlet Connection</b> 0: 1/2" FPT for Non-Toxic Gases 1: Stainless Steel Manifolds for Non-Toxic Gases (36" flexible pigtails at each station) 3: Diaphragm Valves for Non-Toxic Gases* (Two 36" flexible pigtails) 4: Stainless Steel Manifolds for Non-Toxic Gases (24" flexible pigtails at each station) 5: Stainless Steel Manifolds for Toxic Gases† (36" flexible pigtails at each station) 6: 1/2" FPT with captured vent 7: Stainless Steel Manifolds for Toxic Gases† (24" flexible pigtails at each station) 8: Diaphragm Valves for Toxic Gases*† (Two 36" flexible pigtails) 9: Diaphragm Valves* (Two 72" stainless steel pigtails)  *One cylinder/side only †Includes captured vent	<b>Cylinders/Side</b> 0: No Inlet Connection* 1: One Cylinder 2: Two Cylinders 3: Three Cylinders 4: Four Cylinders 5: Five Cylinders 6: Six Cylinders 7: Seven Cylinders 8: Eight Cylinders 9: Nine Cylinders A: Eleven Cylinders B: Twelve Cylinders C: Thirteen Cylinders D: Fourteen Cylinders	<b>Assembly</b> 1: Without Alarm Capability 4: With Alarm Capability* (Alarm Sold Separately)  *Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.	<b>Pigtail</b> Please specify inlet connection (if applicable)  CGA DIN 477 BS 341 and others available
Related Options	See Pages 4.94 and 4.95 for Alarm Options				

automatic switchover system from LP cryogenic source to HP cylinders

**536 Series**

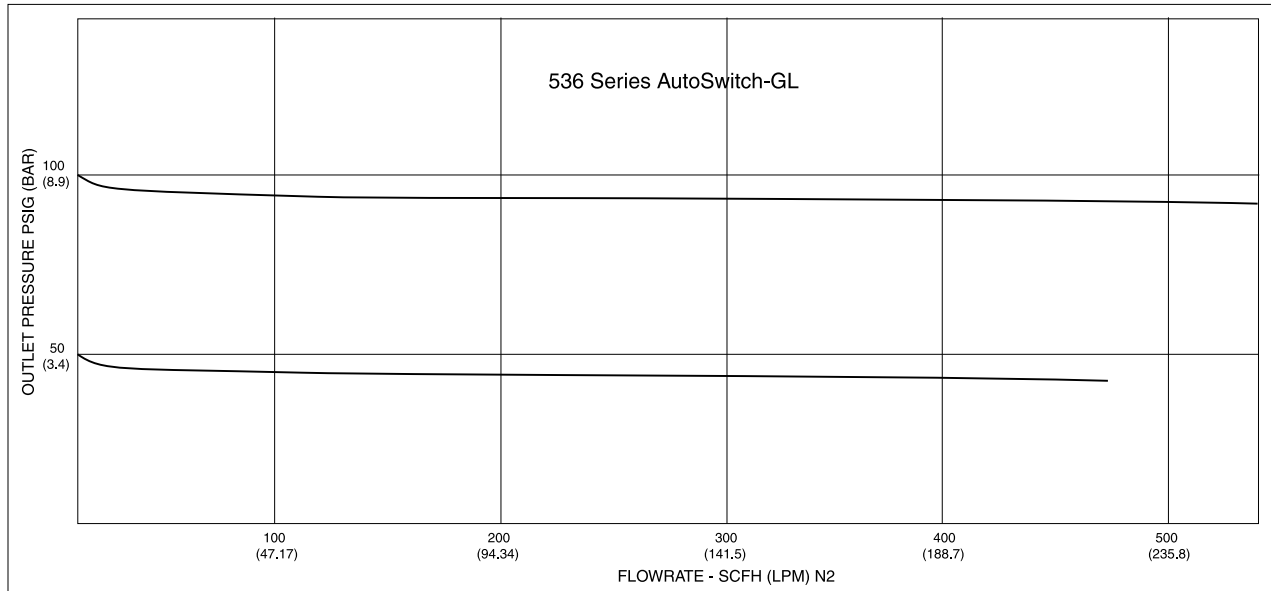


4

Description	Advanced Features	
<p>The 536 Series AutoSwitch GL is a continuous gas delivery system for high purity gas service that automatically changes cylinder or bank priority from a cryogenic source to a reserve bank of high pressure cylinders without transmitting pressure fluctuations to the use line.</p>	<ul style="list-style-type: none"> <li>• Integral Line Regulator Stable line pressure during change over</li> <li>• 400 Series Brass System Components Capsule<sup>®</sup> seat</li> <li>• Metal to metal seals No possibility of gas contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Variable Line Pressure Line pressure changeable on site</li> <li>• Preset Switching Pressure Prevents tampering or adjustment</li> <li>• Integral Manifold System Easy installation</li> </ul>

Remote Alarm	Materials	Specifications
<p>Providing audible and visible notification of cylinder depletion, one Advantium 8 remote alarm can monitor and power up to four switchover stations. See page 4.94.</p> <p><i>Intrinsic Safety Barriers</i> Safe use with flammable gases or in hazardous areas (class 1, division 1, group A, B, C or D)</p> <p><i>Relay Output</i> Easy integration with other alarm systems</p> <p><i>Telephone Dialer</i> Notify multiple off-site locations of the need to change depleted cylinders</p> <p><i>Computer Interface</i> Serial communication through RS-232 port</p>	<p><i>Priority Valve</i> Brass barstock</p> <p><i>Line Regulator</i> Brass barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Enclosure</i> Acrylic powder-coated steel</p> <p><i>Tubing and Fittings</i> 316 stainless steel</p> <p><i>Internal Seats and Seals</i> PTFE</p> <p><i>Pressure Gauges and Switches</i> Brass, bronze and stainless steel</p> <p><i>Check Valves</i> Brass with Viton<sup>®</sup> seals</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Maximum Flow (100 PSIG)</i> 600 scfh (283 lpm)</p> <p><i>Inlet Connection</i> ½" FPT</p> <p><i>Outlet Connection</i> ¼" stainless steel compression tube</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Weight</i> 40 lbs. (18 kg)</p>

## Flow Performance



## Ordering Information and Configuration Options

536	A	B	C	D	-Inlet
<b>Series</b> 536	<b>Outlet Pressure</b> 2: 0-50 PSIG 3: 0-100 PSIG	<b>Liquid Cylinders (Primary)</b> 0: No Inlet Connection 1: One Cylinder* 2: Two Cylinders† 3: Three Cylinders† 4: Four Cylinders†  * Includes 36" flexible pigtail and diaphragm valve  † Each manifold header includes 36" flexible pigtail, manifold extensions and mounting hardware	<b>High Pressure (Reserve)</b> 0: No Inlet Connection 1: One Cylinder* 2: Two Cylinders† 3: Three Cylinders† 4: Four Cylinders† 5: Five Cylinders† 6: Six Cylinders†  * Includes 36" flexible pigtail and diaphragm valve  † Each manifold header includes 36" flexible pigtail, manifold extensions and mounting hardware	<b>Assembly</b> 1: Without Alarm Capability 4: With Alarm Capability* (Alarm Sold Separately)  *Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.	<b>Pigtail</b> Please specify inlet connection (If applicable).  CGA DIN 477 BS 341 and others available
<b>Related Options</b>	See Pages 4.94 and 4.95 for Alarm Options				

corrosion resistant, automatic switchover system from LP cryogenic source to HP cylinders

**537 Series**



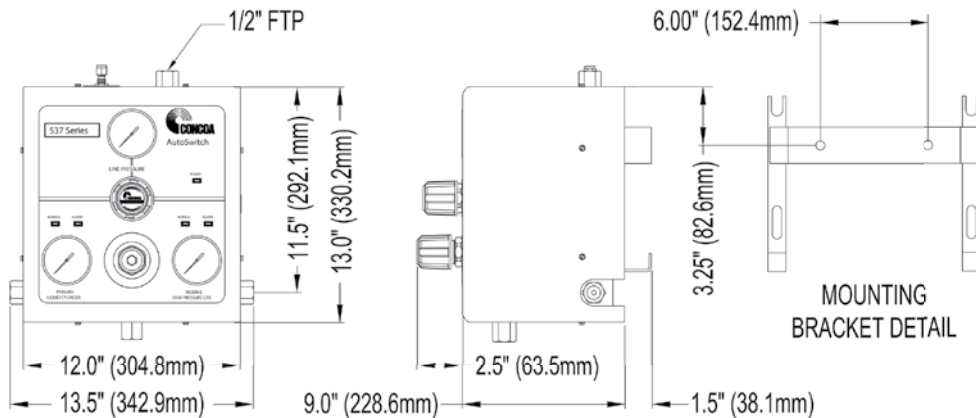
4

Description	Typical Applications
<p>The 537 AutoSwitch GL is a continuous gas delivery system for high purity gas service that automatically changes cylinder or bank priority from cryogenic sources to a reserve bank of high pressure cylinders without transmitting pressure fluctuations to the use line.</p>	<ul style="list-style-type: none"> <li>• Primary cryogenic high purity gas supply</li> <li>• Inductively Coupled Plasma (ICP) and ICP mass spec support gases</li> <li>• Incubator Carbon Dioxide and Nitrogen central supply system</li> <li>• Pure cryogenic process gas supply</li> <li>• Modified Atmosphere Packaging (MAP)</li> <li>• Pharmaceutical gas supply</li> </ul>

Features	Materials	Specifications
<p><i>400 Series 316L Stainless Components</i> CAPSULE<sup>®</sup> seat</p> <p><i>Metal-to-Metal Seals</i> No possibility of gas contamination</p> <p><i>Integral Line Regulator</i> Stable line pressure during change over</p> <p><i>Variable Line Pressure</i> Line pressure changeable on site</p> <p><i>Preset Switching Pressure</i> Prevents tampering or adjustment</p> <p><i>Integral Manifold System</i> Easy installation</p> <p><i>Optional Alarms</i> Advantium 16 monitors Up to 8 Systems Advantium 2 PLUS monitors 1 System</p>	<p><i>Priority Valve</i> 316L stainless steel barstock</p> <p><i>Line Regulator</i> 316L stainless steel barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Enclosure</i> Acrylic powder-coated steel</p> <p><i>Tubing and Fittings</i> 316L stainless steel</p> <p><i>Internal Seals</i> PTFE</p> <p><i>Seats</i> PTFE (line regulators) PCTFE (inlet regulators)</p> <p><i>Pressure Gauges and Switches</i> 316L stainless steel</p> <p><i>Check Valves</i> 316L stainless steel with Viton<sup>®</sup> seal</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Maximum Flow (100 PSIG)</i> 400 SCFH (190 LPM)</p> <p><i>Cv</i> 0.1</p> <p><i>Inlet Connection</i> 1/2" FPT</p> <p><i>Outlet Connection</i> 1/4" stainless steel compression tube</p> <p><i>Relief Valve Outlet</i> 1/2" FPT</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Weight</i> 40 lbs. (18 kg)</p>



## Flow Performance



## Ordering Information and Configuration Options

537	A	B	C	D	-CON
<b>Series 537</b>	<b>Outlet Pressure</b>	<b>Liquid Cylinders (Primary)</b>	<b>High Pressure (Reserve)</b>	<b>Assembly</b>	<b>Hose</b>
	2: 0-50 PSIG (0-3.5 BAR)	0: No inlet connection	0: No inlet connection	1: Without alarm capability	Please specify inlet connection (if applicable)
	3: 0-100 PSIG (0-7 BAR)	1: One cylinder*	1: One cylinder*	4: With alarm capability* (alarm sold separately)	CGA DIN 477 BS 341 and others available
	7: 0-150 PSIG (0-10 BAR)	2: Two cylinders†	2: Two cylinders†	*Intrinsic safety barriers are required for use in hazardous environments.	
		3: Three cylinders†	3: Three cylinders†		
		4: Four cylinders†	4: Four cylinders†		
		*Includes 36" (900mm) flexible hose and diaphragm valve	5: Five cylinders†		
		†Each manifold header includes 36" (900mm) flexible hose, manifold extensions and mounting hardware	6: Six cylinders†		
			*Includes 36" (900mm) flexible hose and diaphragm valve		
			†Each manifold header includes 24" (600mm) flexible hose, manifold extensions and mounting hardware		

### Related Options

Option	Order Number	Description
Remote Alarm	Advantium Series	Provides audible and visible notification of a depleted supply bank to a remote location

microprocessor control electronic switchover system

**538 Series**

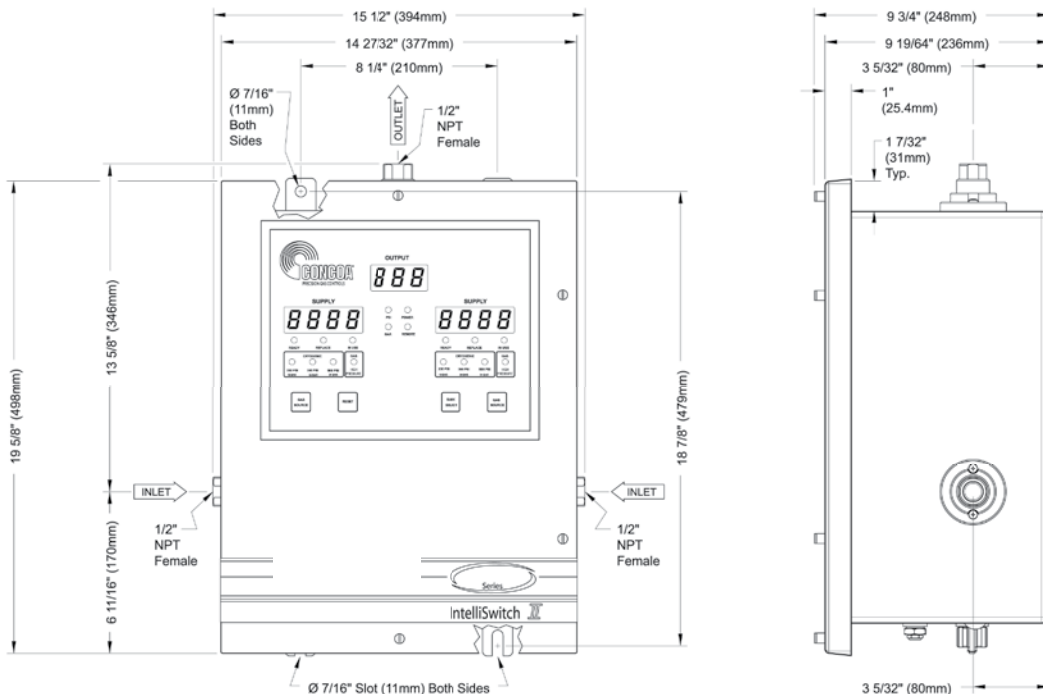


4

Description	Typical Applications
<p>The fully-automatic 538 Series IntelliSwitch II gas switchover is CONCOA's revolutionary new generation of gas management systems. The IntelliSwitch II features a proprietary onboard I-Link web server technology allowing remote monitoring, secure system configuration, and e-mail notification of real-time system status and events. It is ideally suited to interchangeable service/continuous supply in analytical laboratory, chemical process, instrumentation, and critical gas supply applications. The IntelliSwitch II offers continuous gas pressure and flow control from liquid or high pressure cylinder sources. The end user selects the mode of supply by the simple push of a button. Proprietary software logic lowers yearly gas costs by eliminating liquid cylinder vent loss and excess residual return.</p>	<ul style="list-style-type: none"> <li>• High purity, non-corrosive, non-flammable gas supply</li> <li>• Gas chromatograph and mass spec carrier and support gases</li> <li>• Inductively coupled plasma (ICP) and ICP-mass spec continuous gas supply</li> <li>• Incubator Carbon Dioxide and Nitrogen gas supply</li> <li>• Biotech, pharmaceutical and forensic gas systems</li> <li>• Microbulk changeover supply</li> <li>• Central gas supply system for laboratory, research or process plants</li> </ul>

Features	Materials	Specifications
<p><i>Micro-Processor Control</i> Fully automatic priority assignment</p> <p><i>Remote and Field-Adjustable Software</i> Enables process flexibility and remote monitoring</p> <p><i>On-Site or Remote Source Selection</i> Liquid cylinder or high-pressure service</p> <p><i>On Board Web Server and Remote Software</i> Enables monitoring and control functions</p> <p><i>Low Loss Technology</i> Reduces residual return</p> <p><i>Electronic Economizer</i> Eliminates liquid cylinder vent loss</p> <p><i>Process Gas Pilot Valve</i> Simple installation</p> <p><i>RS 232 Communication</i> Provides remote monitoring of supply</p> <p><i>NEMA 4 Enclosure Standard</i> Install anywhere</p> <p><i>Single &amp; Dual Stage Pressure Control</i> Provide high flow and stable outlet pressure control</p>	<p><i>Regulator and Valve Bodies</i> Brass barstock</p> <p><i>Valve Stems</i> 316L stainless steel</p> <p><i>Valve Seats</i> PCTFE</p> <p><i>Seals</i> PTFE, PCTFE and Viton<sup>®</sup></p> <p><i>Enclosure</i> NEMA 4 Powder-coated steel</p>	<p><i>CE marked</i> Conforms to EU directives</p> <p><i>Power Requirements</i> 110 or 220 VAC (terminal block provided with 1/2" conduit hole)</p> <p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> 0°F to 140°F (-18°C to 60°C)</p> <p><i>Flow Capacity</i> Cv = 1.0</p> <p><i>Filter</i> 40-micron</p> <p><i>Inlet Connection</i> 1/2" FPT</p> <p><i>Outlet Connection</i> 1/2" FPT</p> <p><i>Weight</i> 67 lbs. (30.4 kg)</p>

## Installation Dimensions



## Ordering Information

538	A	B	C	D	-CON
Series 539	<b>Delivery Pressure</b> <b>C:</b> 100 PSIG (7 BAR) <b>D:</b> 150 PSIG (10 BAR) <b>E:</b> 200 PSIG (14 BAR)	<b>Right Side Connection</b> <b>0:</b> 1/2" FPT <b>1:</b> Diaphragm valves with 36" (900mm) stainless flexible hose <b>2:</b> Diaphragm valves with 72" (1800mm) stainless flexible hose <b>3:</b> Manifold connector	<b>Left Side Connection</b> <b>0:</b> 1/2" FPT <b>1:</b> Diaphragm valves with 36" (900mm) stainless flexible hose <b>2:</b> Diaphragm valves with 72" (1800mm) stainless flexible hose <b>3:</b> Manifold connector	<b>Assembly</b> <b>7:</b> Single Stage Pressure Control <b>G:</b> Dual Stage Pressure Control	<b>Hose</b> Please specify inlet connection (if applicable)  CGA DIN 477 BS 341 and others available

## Related Options

Option	Order Number	Description
Remote Alarm	Advantium Series	Provides audible and visible notification of a depleted supply bank to a remote location
Vent Manifold Kit	629 Series	Wall-mounted manifold designed to equalize liquid cylinder head pressure
Switchover Station	518 1625	Safely mount and secure any switchover and 2 cylinders
AutoSwitch Floor Stand	830 7439	Support AutoSwitch enclosure
Manifold Floor Stand	830 7437	Supports 2 standard length (12") manifold extensions installed consecutively

microprocessor control electronic switchover system

**539 Series**

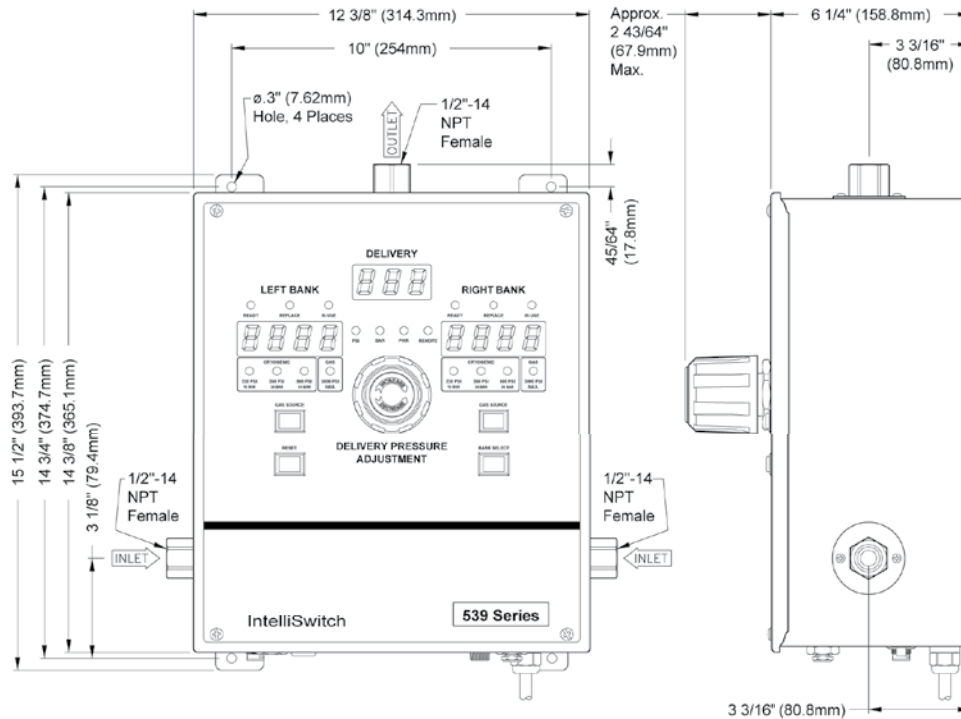
4



Description	Typical Applications
<p>The 539 Series IntelliSwitch is CONCOA's original fully-automatic computer controlled Universal Gas Management System that can provide continuous supply of gas from either cryogenic liquid cylinders or high pressure gas cylinders, or any combination of both. These systems are ideal for use with high purity and ultra high purity gases for laboratory gas chromatography, gas chromatography mass spectrometry, inductively coupled plasma or inductively coupled plasma mass spectrometer support gases as well as for use with Carbon Dioxide or Nitrogen for cell culture incubators. The proprietary software ensures optimal use and savings especially from cryogenic cylinders sources and can greatly reduce or eliminate venting and residual gas return.</p>	<ul style="list-style-type: none"> <li>• High purity non-corrosive non-flammable gas supply</li> <li>• Gas chromatography and mass spec carrier and support gases</li> <li>• Inductively coupled plasma mass spectrometer (ICP-mass spec) continuous gas supply</li> <li>• Incubator Carbon Dioxide and Nitrogen gas supply</li> <li>• Biotech, pharmaceutical and forensic gas systems</li> <li>• Microbulk changeover supply</li> <li>• Central gas supply system for laboratory, research or process plants</li> </ul>

Features	Materials	Specifications
<p><i>Microprocessor Control</i> Fully automatic priority assignment</p> <p><i>Field Adjustable Parameters</i> Enables process flexibility</p> <p><i>On-Site Source Selection</i> Liquid cylinder or high-pressure service</p> <p><i>Low Loss Technology</i> Reduces residual return</p> <p><i>Electronic Economizer</i> Eliminates vent loss from 230 PSIG (15 BAR), 350 PSIG (24 BAR), or 500 PSIG (34 BAR) relief liquid cylinders</p> <p><i>Process Gas or Air Actuated Pilot Valves</i> Simple installation</p> <p><i>RS 232 Communication</i> Provides remote monitoring of supply</p> <p><i>NEMA 12 Enclosure</i> Powder coated for indoor use only</p>	<p><i>Regulator and Valve Bodies</i> Brass barstock</p> <p><i>Valve Stems</i> 316L stainless steel</p> <p><i>Valve Seats</i> PTFE</p> <p><i>Seals</i> PTFE, PCTFE and Viton<sup>®</sup></p> <p><i>Enclosure</i> NEMA 12 powder-coated steel</p>	<p><i>Power Requirements</i> 110 or 220 VAC</p> <p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> 0°F to 140°F (-18°C to 60°C)</p> <p><i>Flow Capacity</i> Cv = 1.0</p> <p><i>Filter</i> 40-micron</p> <p><i>Inlet Connection</i> ½" FPT</p> <p><i>Outlet Connection</i> ½" FPT</p> <p><i>Weight</i> 67 lbs. (30.4 kg)</p>

## Installation Dimensions



## Ordering Information

539	A	B	C	D	-XX	-CON
<b>Series 539</b>	<b>Outlet Pressure</b>	<b>Right Side Connection</b>	<b>Left Side Connection</b>	<b>Assembly</b>	<b>Assembly</b>	<b>Hose</b>
	2: 0-50 PSIG (0-1 BAR)	0: 1/2" FPT	0: 1/2" FPT	2: 110 VAC	-01: Standard	Please specify inlet connection (if applicable)
	3: 0-100 PSIG (0-7 BAR)	1: Diaphragm valve with 36" (900mm) stainless flexible hose	1: Diaphragm valve with 36" (900mm) stainless flexible hose	3: 220 VAC	-0A: Tamper resistant option	CGA DIN 477 BS 341 and others available.
	4: 0-150 PSIG (0-10 BAR)	2: Diaphragm valve with 72" (1800mm) stainless flexible hose	2: Diaphragm valve with 72" (1800mm) stainless flexible hose			
	5: 0-200 PSIG (0-14 BAR)	3: Manifold connector*	3: Manifold connector*			
		*See pages 70-71 for manifold ordering information				

## Related Options

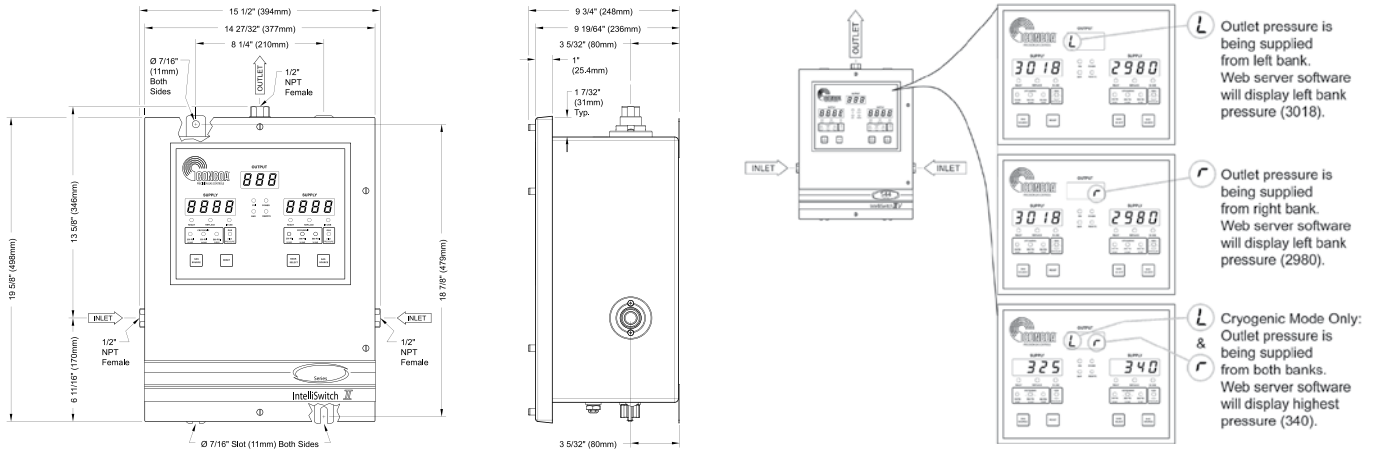
Option	Order Number	Description
Remote alarm	Advantium Series	Provides audible and visible notification of a depleted supply bank to a remote location
Vent manifold kit	52L Series	Wall-mounted manifold designed to equalize liquid cylinder head pressure
Switchover station	518 1625	Safely mount and secure any switchover and 2 cylinders
AutoSwitch floor stand	830 7439	Support IntelliSwitch enclosure
Manifold floor stand	830 7437	Supports two standard length 12"(304.8mm) manifold extensions installed consecutively



Description	Typical Applications
<p>The fully automatic 544 IntelliSwitch IIv switches between two gas sources based on a user settable pressure up to 2000 PSIG (137 BAR). The IntelliSwitch IIv features a proprietary onboard I-link webserver technology allowing remote monitoring and secure system configuration and email notification of real time system status and events. It is ideally suited for high delivery pressure requirements over 400 PSIG (27 BAR) or where the pressure control is separate from the switchover system. The 544 series offers full source pressure from the side selected down to whatever switching pressure is desired from 2000 PSIG (137 BAR) down to 100 PSIG (7 BAR), where the system will automatically switch to the reserve supply and supply that inlet pressure to the outlet requirement. The user can select from any model of delivery liquid cylinders to high pressure cylinders. The end user selects the ideal mode of supply by the simple push of a button. Where pressure is controlled by other devices or where pressure control is not required, the 544 provides a reliable and continuous gas supply.</p>	<ul style="list-style-type: none"> <li>• High delivery pressure gas systems</li> <li>• Aerospace cycle testing</li> <li>• Component Helium Leak testing</li> <li>• Synthetic fuel research and process plants</li> <li>• High pressure air systems</li> <li>• Plant pneumatic valve supply</li> </ul>

Features	Materials	Specifications
<p><i>Microprocessor Control</i> Fully automatic priority assignment</p> <p><i>Remote and Field- Field Adjustable Software</i> Enables process flexibility and remote monitoring</p> <p><i>On-Site or Remote Source Selection</i> Liquid cylinder or high-pressure service</p> <p><i>On Board Web Server and Remote Software</i> Enables monitoring and control functions</p> <p><i>Low Loss Technology</i> Reduces residual return</p> <p><i>Electronic Economizer</i> Eliminates liquid cylinder vent loss</p> <p><i>Process Gas Pilot Valves</i> Simple installation</p> <p><i>NEMA 4 Enclosure Standard</i> Install anywhere</p> <p><i>CE Marked</i> Conforms to EU directives</p>	<p><i>Regulator and Valve Bodies</i> Brass barstock</p> <p><i>Valve Stems</i> 316L stainless steel</p> <p><i>Valve Seats</i> PTFE</p> <p><i>Seals</i> PTFE, PCTFE and Viton<sup>®</sup></p> <p><i>Enclosure</i> NEMA 4 powder-coated steel</p>	<p><i>Power Requirements</i> 100-240 VAC (terminal block provided with 1/2" conduit hole)</p> <p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR)*</p> <p><i>Temperature Range</i> 0°F to 140°F (-18°C to 60°C)</p> <p><i>Flow Capacity</i> Cv = 1.0</p> <p><i>Filter</i> 40-micron</p> <p><i>Inlet Connection</i> 1/2" FPT</p> <p><i>Outlet Connection</i> 1/2" FPT</p> <p><i>Weight</i> 67 lbs. (30.4 kg)</p> <p><i>*Requires external pilot gas</i></p>

## Installation Dimensions



## Ordering Information

544	A: Maximum Inlet Pressure/Assembly	B: Right Side Connection	C: Left Side Connection	D: Factory Preset Switchover Pressure (field adjustable)	-CON	
<b>Series 544</b>	<b>B:</b> Internal Pilot 3000 PSIG (210 BAR)	(see below)	(see below)	<b>1:</b> 100 PSIG (7 BAR)	<b>B:</b> 1100 PSIG (75 BAR)	<b>Hose</b>
	<b>J:</b> External pilot required; no pilot kit included 4500 PSIG (310 BAR)			<b>2:</b> 200 PSIG (14 BAR)	<b>C:</b> 1200 PSIG (82 BAR)	Please specify inlet connection (if applicable)
	<b>R:</b> External pilot required; pilot kit pre-installed on right side MicroManifold 4500 PSIG (310 BAR)*			<b>3:</b> 300 PSIG (21 BAR)	<b>D:</b> 1300 PSIG (89 BAR)	
	<b>L:</b> External pilot required; pilot kit pre-installed on left side MicroManifold 4500 PSIG (310 BAR)†			<b>4:</b> 400 PSIG (27 BAR)	<b>E:</b> 1400 PSIG (96 BAR)	CGA DIN 477 BS 341 and others available.
	*Not valid with B = 0, 1, 2 or 3 †Not valid with C = 0, 1, 2 or 3			<b>5:</b> 500 PSIG (34 BAR)	<b>F:</b> 1500 PSIG (100 BAR)	
			<b>6:</b> 600 PSIG (42 BAR)	<b>G:</b> 1600 PSIG (110 BAR)		
<b>Inlet Connection Options (B and C)</b>						
<b>0:</b> 1/2" FPT port						
<b>1:</b> Diaphragm valve with 36" (900 mm) stainless steel flexible hose*						
<b>2:</b> Diaphragm valve with 72" (1800 mm) stainless steel flexible hose*						
<b>3:</b> Manifold connector						
<b>C:</b> MicroManifold no hoses						
<b>D:</b> MicroManifold with one 36"(900 mm) stainless steel flexible hose						
<b>E:</b> MicroManifold with two 36"(900 mm) stainless steel flexible hoses						
<b>F:</b> MicroManifold with three 36"(900 mm) stainless steel flexible hoses						
<b>G:</b> MicroManifold four 36"(900 mm) stainless steel flexible hoses						
<b>H:</b> MicroManifold with one 72"(1800 mm) stainless steel flexible hose						
<b>J:</b> MicroManifold with two 72" (1800 mm) stainless steel flexible hoses						
<b>L:</b> MicroManifold with three 72"(1800 mm) stainless steel flexible hoses						
<b>M:</b> MicroManifold with four 72"(1800 mm) stainless steel flexible hoses						
*Not valid with A = J, R or L						
				<b>7:</b> 700 PSIG (48 BAR)	<b>H:</b> 1700 PSIG (117 BAR)	
				<b>8:</b> 800 PSIG (55 BAR)	<b>J:</b> 1800 PSIG (124 BAR)	
				<b>9:</b> 900 PSIG (62 BAR)	<b>K:</b> 1900 PSIG (131 BAR)	

## Related Options

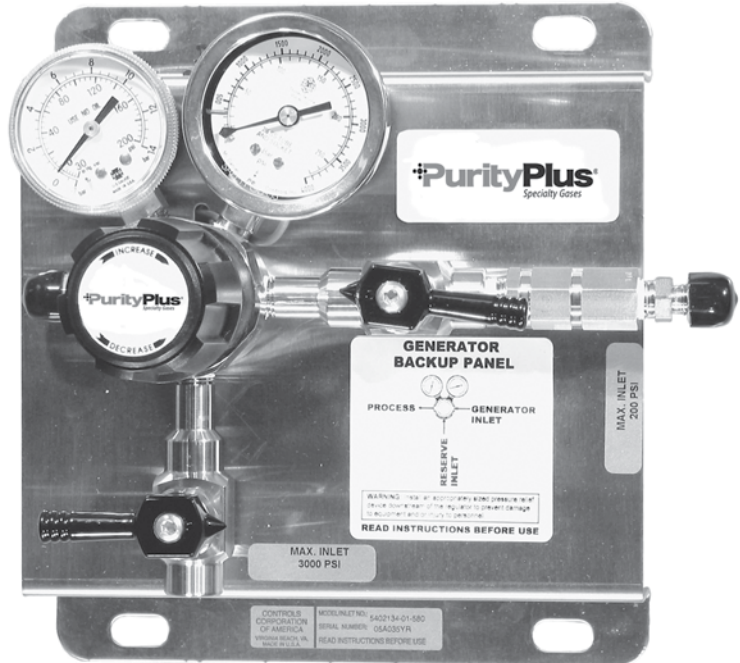
Option	Order Number	Description
Remote alarm	Advantium Series	Provides audible and visible notification of a depleted supply bank to a remote location
Vent manifold kit	52L Series	Wall-mounted manifold designed to equalize liquid cylinder head pressure
Switchover station	518 1625	Safely mount and secure any switchover and 2 cylinders
AutoSwitch floor stand	830 7439	Support IntelliSwitch enclosure
Manifold floor stand	830 7437	Supports two standard length 12"(304.8mm) manifold extensions installed consecutively

**Description**

The 540 Series Back-Up Panel is designed to provide a reserve supply to any continuous supply system such as a generator, switchover, or bulk source. If supply is interrupted for any reason, the reserve supply will automatically activate and supply gas without interruption. When the primary source is capable of supplying the system, the reserve shuts down. Back-up panels are available in brass or 316 stainless steel construction. With the available remote alarm package, the system can signal when the reserve supply is active or running low.

**Typical Applications**

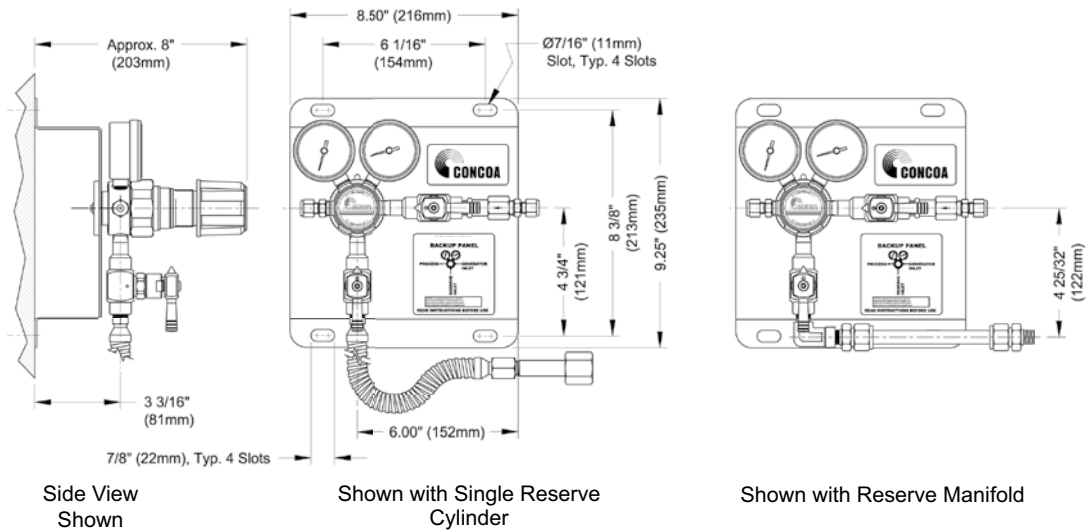
- Generator backup supply
- Gas chromatography, flame ionization detector, and mass spec backup
- Microbulk and bulk backup or reserve
- Critical laboratory gas reserve
- Incubator Carbon Dioxide backup supply



Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Adjustable pressure</i> User determines the pressure at which the reserve supplies system</li> <li>• <i>Check valves on both generator and reserve</i> Prevents back flow to the generator or reserve cylinder</li> <li>• <i>Shut-off valves on both generator and reserve</i> Allows isolation and disconnection of either line</li> </ul>	<p><i>Regulator body</i> Brass or 316L stainless steel barstock</p> <p><i>Bonnet</i> Brass or chrome-plated brass barstock</p> <p><i>Seats</i> PTFE (line regulator) PCTFE (inlet regulators)</p> <p><i>Filter</i> 10 micron sintered bronze mesh or patented 316L stainless steel mesh</p> <p><i>Diaphragm and Hose</i> 316L stainless steel</p> <p><i>Cylinder Connections</i> Brass or 316L stainless steel with check valve</p> <p><i>Check Valve Seat</i> Viton®</p> <p><i>Panel</i> 304 stainless steel</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter brass or 316L stainless steel</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-9</sup> scc/sec</p> <p><i>Two Adjustable Pressure Ranges</i> 0 to 150 PSIG (0 to 10 BAR) 150-500 PSIG (10-34 BAR)</p> <p><i>Cv</i> 0.1</p> <p><i>Weight</i> Brass - 6.5 lbs. (2.95 kg) Stainless steel - 7.25 lbs (3.29 kg)</p>



## Installation Dimensions



## Ordering Information

540	A	B	C	D	-CON
Series 540	Material	Number of Reserve Cylinders	Hose Style	Assembly/Gauges	Hose
	1: Brass 150 PSIG (10 BAR) maximum outlet	1: 1 cylinder with diaphragm valve	0: No hoses	1: 0-4000 PSIG/28,000 kPa gauge, no alarm capability	CGA DIN 477 BS 341 and others available
	2: 316L stainless steel available 150 PSIG (10 BAR) maximum outlet	2: 2 cylinder manifold	2: 24" (600mm) flexible 316 stainless steel with check valve	2: 0-275 BAR/0-4000 PSIG gauge, no alarm capability	
	3: Brass 500 PSIG (34 BAR) maximum outlet	3: 3 cylinder manifold	3: 36" (900mm) flexible 316 stainless steel with check valve	4: 0-275 BAR/0-4000 PSIG gauge with pressure switch and 110/220 VAC remote alarm	
	4: 316L stainless steel 500 PSIG (34 BAR) maximum outlet	4: 4 cylinder manifold	6: 72" (1800mm) flexible 316 stainless steel with check valve	9: 0-275 BAR/0-4000 PSIG gauge with pressure switch without remote alarm	
		5: 5 cylinder manifold			
		6: 6 cylinder manifold			
		7: 7 cylinder manifold			
		8: 8 cylinder manifold			
		9: 9 cylinder manifold			
		0: 10 cylinder manifold			
		A: 11 cylinder manifold			
		B: 12 cylinder manifold			
		C: 13 cylinder manifold			
		D: 14 cylinder manifold			
		E: 15 cylinder manifold			
		W: Diaphragm valve with 1/4" FPT port			
		Y: Diaphragm valve with manifold connection			

**SilcoNert™ 1020 Switchover** **515 Series**

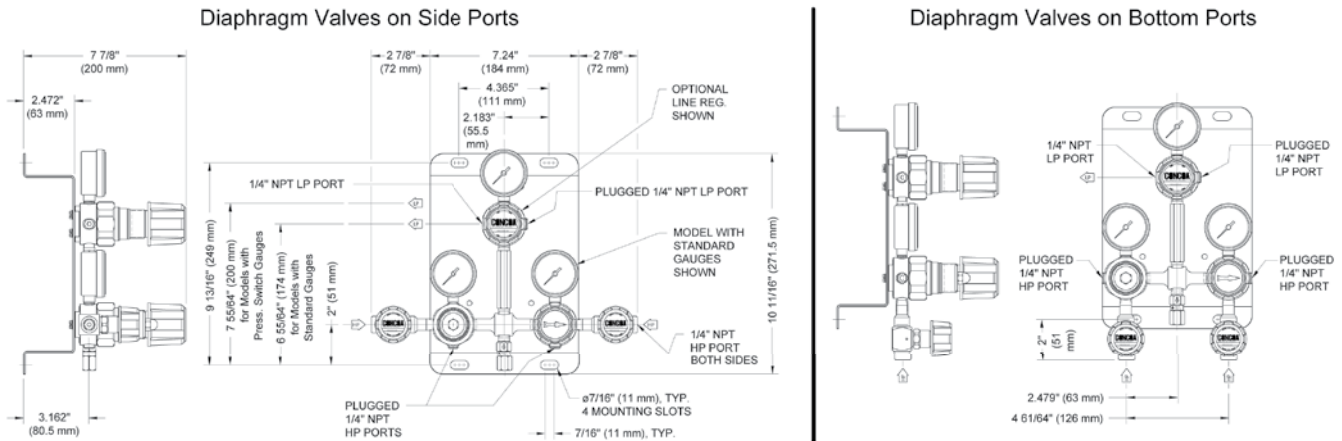
4

<b>Description</b>
The 515 Series SilcoNert 1020 is an automatic switchover system designed to deliver a continuous supply of reactive, corrosive, or high purity gases for calibration, instrument support, or process control. The proprietary amorphous Silicon surface finish provides extreme inertness and corrosion resistance over 316L stainless steel. To maintain constant downstream pressure, an integral line regulator option is available.
<b>Typical Applications</b>
<ul style="list-style-type: none"> <li>• Reactive calibration standard</li> <li>• Emissions monitoring</li> <li>• Hydrogen Sulfide and reduced sulfur calibration standards</li> <li>• Mercury calibration standards</li> <li>• Low level sulfur in hydrocarbon gas control</li> <li>• Corrosive gases</li> <li>• Ultra high purity instrument pure gases</li> </ul>



Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>400 Series Stainless Steel Regulators</i> CAPSULE® seat</li> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>User-Friendly Priority Valve</i> One knob switches cylinder priority</li> <li>• <i>Check Valves in Inlet Gland</i> Prevents contamination and back flow.</li> <li>• <i>Optional Line Regulator</i> Stable line pressure during change over</li> <li>• <i>Optional Remote Alarm</i> Easy integration with Advantium system CE-marked universal voltage alarm</li> </ul>	<p><i>Bodies</i> SilcoNert 1020</p> <p><i>Bonnet</i> Chrome-plated brass barstock</p> <p><i>Diaphragms</i> SilcoNert 1020</p> <p><i>Seats</i> PTFE (line regulator) PCTFE (inlet regulators)</p> <p><i>Filters</i> 10 micron SilcoNert 1020 mesh</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 4500 PSIG (310 BAR) limited by peripherals and cylinder standard</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel (bourdon tube not treated)</p> <p><i>Outlet Connection</i> 1/4" MPT (without line regulator) 1/4" FPT (with line regulator)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Two Adjustable Pressure Ranges</i> 0 to 150 PSIG (0 to 10 BAR) 150-500 PSIG (10-34 BAR)</p> <p><i>Cv</i> 0.1</p> <p><i>Weight</i> 8.25 lbs. (3.71 kg)</p>

## Installation Dimensions



## Ordering Information

515	A	B	C	D	-CON
<b>Series 515</b>	<b>Switching Pressure (Priority R/L)</b>	<b>Inlet Connection</b>	<b>Line Regulator</b>	<b>Assembly</b>	<b>Installed Options</b>
	<b>4:</b> 200/170 PSIG (13.5/11.5 BAR)	<b>0:</b> 1/4" FPT ports	<b>0:</b> None	<b>1:</b> 0-4000 PSIG/0-28,000 kPa gauges no alarm capability	Please specify inlet connection (if applicable)  CGA DIN 477 BS 341 and others available
	<b>5:</b> 500/470 PSIG (33.8/31.8 BAR)	<b>1:</b> 36" (900mm) stainless steel flexible hoses	<b>1:</b> 0-15 PSIG (0-1 BAR)	<b>2:</b> 0-280 BAR/4000 PSIG gauges no alarm capability	
	<b>8:</b> 300/270 PSIG (21/18 BAR)	<b>3:</b> 24" (600mm) stainless steel flexible hoses	<b>2:</b> 0-50 PSIG (0-3.5 BAR)	<b>4:</b> 0-280 BAR/4000 PSIG gauges with pressure switches† and remote alarm (110/220 VAC)	
		<b>4:</b> Diaphragm valves with 1/4" FPT port	<b>3:</b> 0-100 PSIG (0-7 BAR)	<b>8:</b> 0-280 BAR/4000 PSIG gauges with pressure switches† and without remote alarm	
		<b>5:</b> Diaphragm valves with 36" (900mm) hoses	<b>4:</b> 0-250 PSIG (0-17 BAR)	† Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.	
		<b>7:</b> Diaphragm valves with 24" (600mm) hoses	<b>5:</b> 0-400 PSIG (0-27 BAR)		
		<b>A:</b> 24" (600mm) stainless steel flexible hoses with diaphragm valve	<b>7:</b> 0-150 PSIG (0-10 BAR)		

corrosion resistant, semiautomatic changeover

**526 Series**

**Description**

The 526 Series Switchover is an automatic switchover system designed to supply a continuous supply of high purity, non-corrosive gas. The system comes with either flexible hoses for use with two cylinders or manifold connectors for use with the Maniflex Modular Manifold System. Due to pressure differential considerations, an integral line regulator is available to maintain constant downstream pressure.

**Typical Applications**

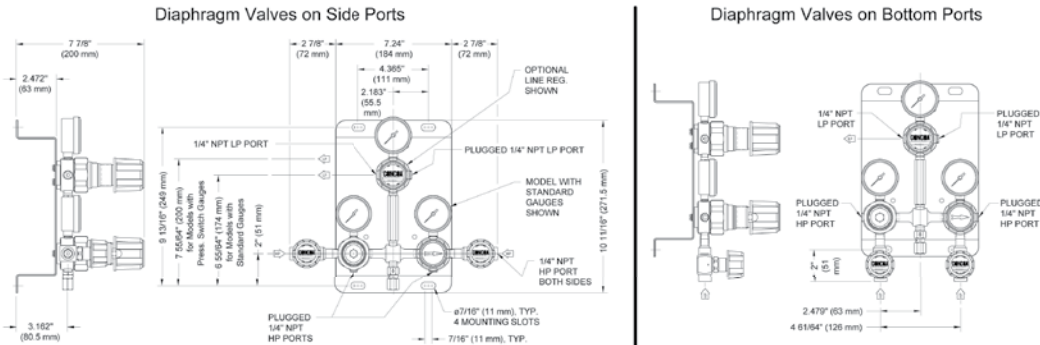
- Ultra-high purity gases
- Gas chromatograph carrier and support gases
- AA grade acetylene
- Cell culture incubator Carbon Dioxide and Nitrogen
- Pure and mixed process gases
- Central gas supply system for laboratory, research or process plants



4

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>400 Series Brass Barstock Regulators</i> CAPSULE<sup>®</sup> seat</li> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>User-Friendly</i> One knob switches cylinder priority</li> <li>• <i>Check Valves in Hose Inlet Glands</i> Prevents contamination and back flow</li> <li>• <i>Compatible with Maniflex Manifolds</i> Multiple cylinders per side</li> <li>• <i>Optional Line Regulator</i> Stable line pressure during change over</li> <li>• <i>Optional Remote Alarm</i> Easy integration with Advantium system CE marked universal voltage alarm</li> <li>• <i>Optional Purge Valves</i> Allows purging after cylinder change over</li> <li>• <i>Optional Outlet Valve</i> Allows isolation of pipeline</li> </ul>	<p><i>Bodies</i> Brass barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Seats</i> PTFE (line regulators) PCTFE (inlet regulators)</p> <p><i>Filters</i> 10 micron sintered bronze</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter brass</p> <p><i>Outlet Connection</i> ¼" MPT (without line regulator) ¼" FPT (with line regulator)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight</i> 8.25 lbs. (3.71 kg)</p>

## Installation Information



## Ordering Information

526	A	B	C	D	-CON	Optional
<b>Series 526</b>	<b>Switching Pressure (Priority R/L)</b>	<b>Inlet Connection</b>	<b>Line Regulator</b>	<b>Assembly</b>	<b>Hose</b>	
	1: 125/105 PSIG* (8.4/7.1 BAR)	0: 1/4" FPT ports	0: None	1: 0-4000 PSIG/0-28,000 kPa gauges no alarm capability*	Please specify inlet connection (if applicable)	A: Outlet valve
	2: 70/50 PSIG* (4.8/3.5 BAR)	1: 36" (900mm) stainless steel flexible hoses	1: 0-15 PSIG (0-1 BAR)	2: 0-275 BAR/0-4000 PSIG gauges no alarm capability		B: Outlet valve and purge valve
	3: 100/75 PSIG (6.8/5.1 BAR)	2: Manifold connectors*	2: 0-50 PSIG (0-3.5 BAR)	4: 0-275 BAR/0-4000 PSIG with pressure switches and remote alarm (110/220 VAC)†*	CGA DIN 477 BS 341 and others available	V: Purge valves
	4: 200/170 PSIG (13.5/11.5 BAR)	3: 24" (600mm) stainless steel flexible hoses	3: 0-100 PSIG (0-7 BAR)	5: 0-40 BAR/0-600 PSIG gauges no alarm capability		
	5: 500/470 PSIG (33.8/31.8 BAR)	4: Diaphragm valves with 1/4" FPT port	4: 0-250 PSIG (0-17 BAR)	7: 0-40 BAR/0-600 PSIG with pressure switches and remote alarm (110/220 VAC)†		
	7: 150/130 PSIG (10.1/8.8 BAR)	5: Diaphragm valves with 36" (900mm) hoses	5: 0-400 PSIG (0-27 BAR)	8: 0-275 BAR/0-4000 PSIG* with pressure switches and without remote alarm†		
	8: 300/270 PSIG (20.3/22.3 BAR)	6: Diaphragm valves with manifold connectors*	7: 0-150 PSIG (0-10 BAR)	9: 0-40 BAR/0-600 PSIG with pressure switches and without remote alarm		
	*Not available with 4500 PSIG (310 BAR) inlet Note: switching pressure must be higher than line regulator pressure selected in column C.	7: Diaphragm valves with 24" (600mm) hoses	A: 0-15 PSIG (0-1 BAR) redline for acetylene	*0-6000 PSIG/415 BAR gauges with 4500 PSIG (310 BAR) maximum inlet option †Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.		
		8: 36" (900mm) stainless steel flexible hoses and 4500 PSIG (310 BAR) maximum inlet pressure				
		9: 1/4" FPT ports and 4500 PSIG (310 BAR) maximum inlet pressure				
		A: 36" (900mm) stainless steel flexible hoses with flashback arrestor for acetylene				
		B: 36" (900mm) stainless steel flexible hoses with flashback arrestor for acetylene and with diaphragm valve				
		C: Compact manifold connector*				
		D: Diaphragm valves with compact manifold connectors*				

automatic changeover

**526 LC Series**

4

**Description**

The 526 LC Series is an automatic switchover system designed to continuously supply high purity gas from a primary cryogenic source and backup high pressure cylinders. The system comes with options for flexible hoses or manifold connectors for the high pressure side for multiple cylinders. Due to flow and pressure limitations from a cryogenic sources the system has only three switching options that are matched to the three relief valve settings for cryogenic liquid cylinders.

**Typical Applications**

- Low flow purging
- Single inductively coupled plasma mass spectrometer (ICP-mass spec) argon installation
- Cell culture incubators

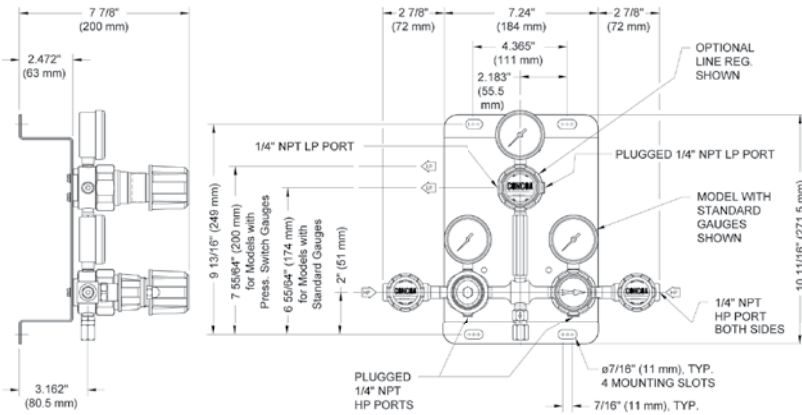


Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Three Matched Switching Pressures</i> 120 PSIG (8 BAR) for 230, 350, or 500 PSIG (15, 24, or 34 BAR) relief liquid cylinders 200 PSIG (14 BAR) for 350 or 500 PSIG (24 or 34 BAR) relief liquid cylinders 300 PSIG (21 BAR) for 500 PSIG (34 BAR) relief liquid cylinders</li> <li>• <i>400 Series Brass Barstock Regulators</i> CAPSULE<sup>®</sup> seat</li> <li>• <i>Metal-to-Metal Diaphragm Seal</i> No possibility of gas contamination</li> <li>• <i>Check Valves in Hose Inlet Glands</i> Prevents contamination and back flow</li> <li>• <i>Optional Line Regulator</i> Stable line pressure during change over</li> <li>• <i>Optional Remote Alarm</i> Easy integration with Advantium system</li> <li>• <i>Optional Purge Valves</i> Allows purging after cylinder change over</li> </ul>	<p><i>Bodies</i> Brass barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Seats</i> PTFE (line regulators) PCTFE (inlet regulators)</p> <p><i>Filters</i> 10 micron sintered bronze</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Right Side Liquid Cylinder</i> 500 PSIG (34.5 BAR) maximum inlet pressure</p> <p><i>Left Side High Pressure Cylinder</i> 3000 PSIG (210 BAR) maximum inlet pressure</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter brass</p> <p><i>Outlet Connection</i> ¼" MPT (without line regulator) ¼" FPT (with line regulator)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight</i> 8.25 lbs. (3.71 kg)</p> <p><i>Maximum Flow (Single Cryogenic Liquid Nitrogen Cylinder)</i> 250 SCFH (118 SLPM) at 120 PSIG (8 BAR) inlet 300 SCFH (141 SLPM) at 200 PSIG (14 BAR) inlet 300 SCFH (141 SLPM) at 300 PSIG (21 BAR) inlet</p> <p><i>Flow can be significantly less depending on liquid cylinder condition and duty cycle.</i></p>

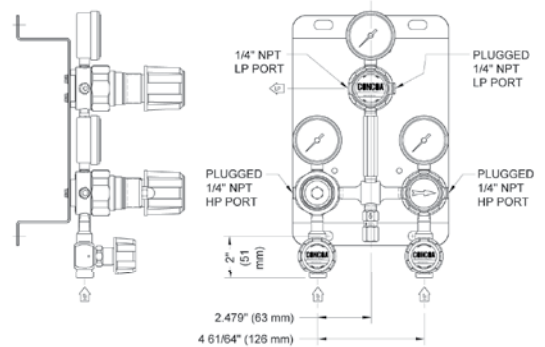
## Installation Information

4

Diaphragm Valves on Side Ports



Diaphragm Valves on Bottom Ports



## Ordering Information

526	A	B	C	D	-CON	Optional	
<b>Series 526</b>	<b>Switching Pressure</b>	<b>Inlet Connection</b>	<b>Line Regulator</b>	<b>Assembly</b>	<b>Hose</b>		
	<b>A:</b> 120 PSIG (8 BAR)	<b>0:</b> 1/4" FPT ports	<b>0:</b> None	<b>A:</b> 0-600 PSIG/0-4200 kPa right side gauge 0-4000 PSI/0-28,000 kPa left side gauge No alarm capability	Please specify inlet connection (if applicable)  CGA DIN 477 BS 341 and others available	<b>A:</b> Outlet valve	
	<b>B:</b> 200 PSIG (14 BAR)	<b>1:</b> 36" (900mm) stainless steel flexible hoses	<b>1:</b> 0-15 PSIG (0-1 BAR)	<b>B:</b> 0-42 BAR/0-600 PSIG right side pressure switch gauge 0-275 BAR/0-4000 PSIG left side pressure switch gauge and remote alarm (110/220 VAC)		<b>B:</b> Outlet valve and purge valve	
	<b>C:</b> 300 PSIG (21 BAR)	<b>2:</b> Manifold connectors*	<b>2:</b> 0-50 PSIG (0-3.5 BAR)	<b>C:</b> 0-42 BAR/0-600 PSIG right sde pressure switch gauge 0-275 BAR/0-4000 PSIG left side pressure switch gauge and no alarm		<b>V:</b> Purge valves	
	Note: switching pressure must be higher than line regulator pressure selected in column C .	<b>3:</b> 24" (600mm) stainless steel flexible hoses		<b>3:</b> 0-100 PSIG (0-7 BAR)			
		<b>4:</b> Diaphragm valves with 1/4" FPT port		<b>4:</b> 0-250 PSIG (0-17 BAR)			
		<b>5:</b> Diaphragm valves with 36" (900mm) hoses		<b>7:</b> 0-150 PSIG (0-10 BAR)			
		<b>6:</b> Diaphragm valves with manifold connectors*					
		<b>7:</b> Diaphragm valves with 24" (600mm) hoses					
		<b>C:</b> Compact manifold connector*					
	<b>D:</b> Diaphragm valves with compact manifold connectors*						

switchover **547 Series**

**Description**

The 547 Series Switchover is an automatic switchover system ideal for use in fuel cell or combustion research, aerospace parts cycle testing, or process and pilot plant pneumatic control where an uninterrupted supply of high purity, non-oxidizing gas is required at high pressure. The system comes with options for multiple inlet configurations and can deliver substantial flow with stable line pressure up to 3500 PSIG (240 BAR). It is ideal for use with nitrogen, helium, argon, hydrogen, carbon monoxide, air, or methane where cylinder fill pressures can be as high as 6000 PSIG (415 BAR). The 547 Series features a unique "Switch Shift" adjustment knob on the lower outlet pressure range that allows the unit to be switched from delivering up to 800 PSIG line pressure to as low as 150 PSIG of line pressure to economize cylinder gas consumption.

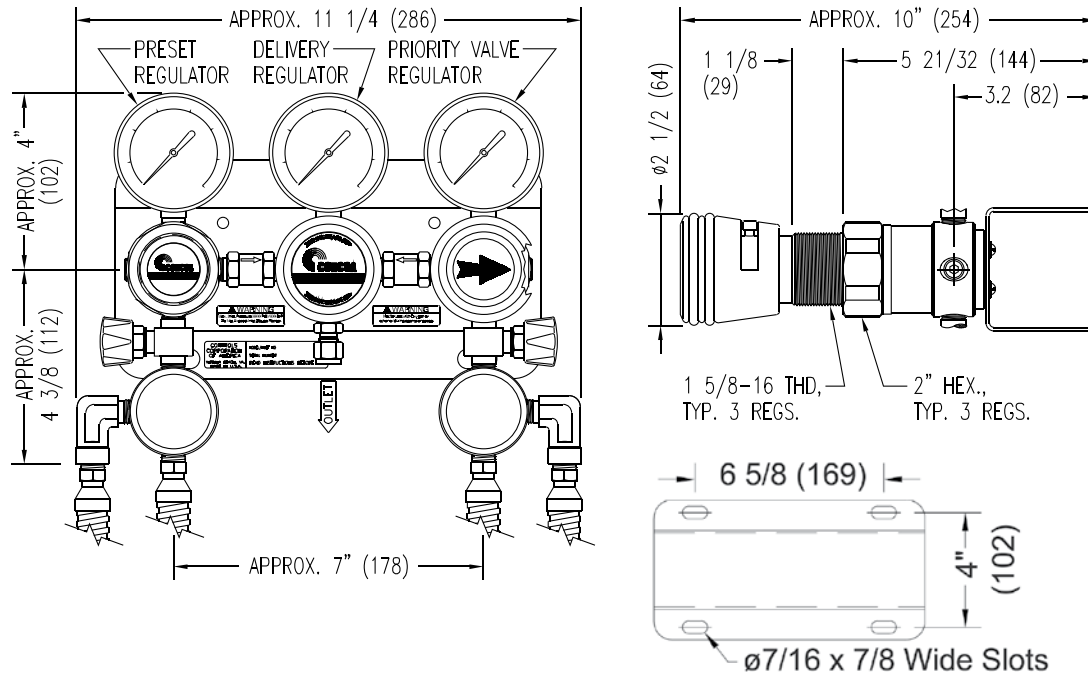


- Typical Applications**
- High delivery pressure gas systems
  - Aerospace cycle testing
  - Component helium leak testing
  - Combustion research laboratories
  - Synthetic fuel research and process plants
  - High pressure hydrogen
  - High pressure air systems
  - Plant pneumatic valve supply

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>493 Series Stainless Steel Regulators</i> Safely controls inlet pressures to 6000 PSIG (415 BAR)</li> <li>• <i>Switch Shift Delivery Pressure Adjustment</i> Economizes cylinder gas use</li> <li>• <i>Check Valves in Hose Inlet Glands</i> Prevents contamination and back flow</li> <li>• <i>Line Regulator</i> Stable line pressure up to 3500 PSIG (240 BAR) during change over</li> <li>• <i>CAPSULE<sup>®</sup> Seat</i> Increased serviceability and life</li> <li>• <i>Optional Remote Alarm</i> Easy integration with Advantium alarm systems</li> </ul>	<p><i>Bodies</i> 316L stainless steel barstock</p> <p><i>Cartridges</i> 316L Stainless steel barstock</p> <p><i>Seats</i> PCTFE Arlon<sup>®</sup> (PEEK) and PCTFE with 6000 PSIG (415 BAR) inlet option</p> <p><i>Filters</i> Patented 10 micron 316 mesh</p> <p><i>Internal Seals</i> Viton<sup>®</sup></p> <p><i>Weight</i> 22.5 lbs. (10.2 kg)</p>	<p><i>Inlet Pressures Available</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) 6000 PSIG (415 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2 1/2" (68mm) diameter stainless steel</p> <p><i>Outlet Connection</i> 1/4" 1/4" stainless steel compression tube fitting</p> <p><i>Cv</i> 0.1</p>



## Installation Information



## Ordering Information

547	A	B		C	D	-CON
Series 547	Delivery Pressure	Max Inlet Pressure	Inlet Gauges	Inlet Connection	Assembly/Gauges	Hose
	1: 800 PSIG/150 PSIG (55 BAR/10 BAR) field selectable	1: 3000 PSIG(210 BAR)	4000 PSIG (275 BAR)	0: 1/4" FPT port	1: PSIG/kPa gauges with no alarm capability	Please specify inlet connection (if applicable)
	2: 1500 PSIG (100 BAR)	2: 4500 PSIG (310 BAR)	6000 PSIG/ (415 BAR)	1: Two needle valves with two 36" † (900mm) flexible hoses (one station per side)	2: PSIG/BAR gauges with no alarm capability	CGA DIN 477 BS 341 and others available
	3: 2500 PSIG (170 BAR)	3: 6000 PSIG* (415 BAR)	10,000 PSIG/ (700 BAR)	2: Two needle valves with four 36" † (900mm) flexible hoses (two stations per side)	4: PSIG/BAR gauges with pressure switches† and remote alarm (110/220 VAC)	3000 PSIG (210 BAR) inlet option suitable for Oxygen service.
	4: 3500 PSIG (240 BAR)	*Not for oxygen service		3: Manifold connectors 3000 PSIG (210 BAR) inlet only	8: PSIG/BAR gauges with pressure switches† and without remote alarm	
				†Diaphragm valves 3000 PSIG	†Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.	

automatic changeover **527 Series**

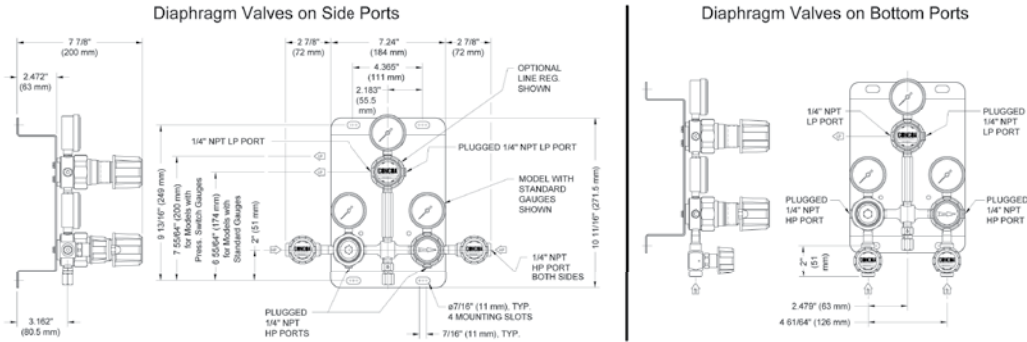
4

<b>Description</b>
<p>The 527 Series Switchover is an automatic switchover system designed to supply a continuous supply of high purity or corrosive gas. The system comes with either flexible hoses for use with two cylinders or manifold connectors for use with the Maniflex Modular Manifold System. Due to pressure differential considerations, an integral line regulator is available to maintain constant downstream pressure.</p>
<b>Typical Applications</b>
<ul style="list-style-type: none"> <li>• Ultra high purity gases</li> <li>• Research grade pure gases</li> <li>• Gas chromatograph carrier and support gases</li> <li>• Pure and mixed process gases</li> <li>• Corrosive gases</li> <li>• Ammonia</li> <li>• Hydrogen Sulfide</li> </ul>



Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>400 Series stainless steel regulators</i> Capsule<sup>®</sup> seat</li> <li>• <i>Metal-to-metal diaphragm seal</i> No possibility of gas contamination</li> <li>• <i>User-Friendly Priority Valve</i> One knob switches cylinder priority</li> <li>• <i>Check valves in inlet gland</i> Prevents contamination and back flow.</li> <li>• <i>Compatible with Maniflex Manifolds</i> Multiple cylinders per side</li> <li>• <i>Optional Line Regulator</i> Stable line pressure during change over</li> <li>• <i>Optional Remote Alarm</i> Easy integration with Advantium system CE marked universal voltage alarm</li> <li>• <i>Optional Purge Valves</i> Allows purging after cylinder change over</li> <li>• <i>Optional Outlet Valve</i> Allows isolation of pipeline</li> </ul>	<p><i>Bodies</i> 316L stainless steel barstock</p> <p><i>Diaphragms</i> 316L stainless steel</p> <p><i>Seats</i> PTFE(line regulators) PCTFE (inlet regulators)</p> <p><i>Filters</i> Patented 10 micron 316 mesh</p> <p><i>Internal Seals</i> PTFE</p>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) optional</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Gauges</i> 2" (53mm) diameter stainless steel</p> <p><i>Outlet Connection</i> ¼" MPT (without line regulator) ¼" FPT (with line regulator)</p> <p><i>Helium Leak Integrity</i> 1 x 10<sup>-8</sup> scc/sec</p> <p><i>Cv</i> 0.1</p> <p><i>Weight</i> 8.25 lbs. (3.71 kg)</p>

## Installation Information



## Ordering Information

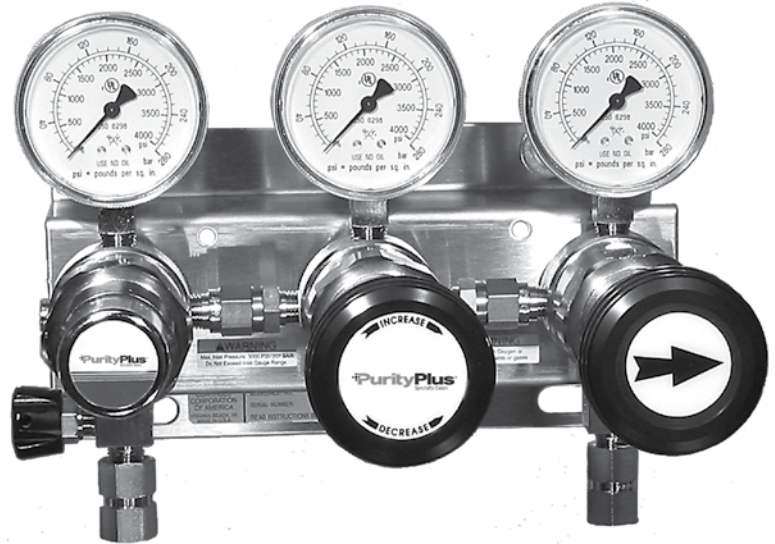
527	A	B	C	D	-CON	Optional
<b>Series 527</b>	<b>Switching Pressure (Priority Right/Left)</b>	<b>Inlet Connection</b>	<b>Line Regulator</b>	<b>Assembly</b>	<b>Hose</b>	
1: 125/105 PSIG (8.4/7.1 BAR)*	0: 1/4" FPT ports	0: None	1: 0-4000 PSIG/0-28,000 kPa gauges* no alarm capability	Please specify inlet connection (if applicable)	<b>A:</b> Outlet valve	
2: 70/50 PSIG (4.8/3.5 BAR)*	1: 36" (900mm) stainless steel flexible hoses	1: 0-15 PSIG (0-1 BAR)	2: 0-275 BAR/0-4000 PSIG gauges* no alarm capability	CGA DIN 477 BS 341 and others available	<b>B:</b> Outlet valve and purge valve	
3: 100/75 PSIG (6.8/5.1 BAR)	2: Manifold connectors*	2: 0-50 PSIG (0-3.5 BAR)	4: 0-275 BAR/0-4000 PSIG* with pressure switches† and remote alarm (110/220 VAC)		<b>C:</b> Outlet valve and stainless steel bonnets	
4: 200/170 PSIG (13.5/11.5 BAR)	3: 24" (600mm) stainless steel flexible hoses	3: 0-100 PSIG (0-7 BAR)	5: 0-42 BAR/0-600 PSIG gauges no alarm capability		<b>D:</b> Outlet valve purge valve and stainless steel bonnets	
5: 500/470 PSIG (33.8/31.8 BAR)	4: Diaphragm valves with 1/4" FPT port	4: 0-250 PSIG (0-17 BAR)	7: 0-42 BAR/0-600 PSIG with pressure switches† and remote alarm (110/220 VAC)		<b>S:</b> Stainless steel bonnets	
7: 150/130 PSIG (10.1/130 BAR)	5: Diaphragm valves with 36" (900mm) hoses	5: 0-400 PSIG (0-27 BAR)	8: 0-275 BAR/0-4000 PSIG* with pressure switches† and without remote alarm		<b>V:</b> Purge valves	
8: 300/270 PSIG (20.3/22.3 BAR)	6: Diaphragm valves with manifold connectors*	7: 0-150 PSIG (0-10 BAR)	9: 0-42 BAR/0-4000 PSIG with pressure switches and without remote alarm		<b>W:</b> Stainless steel bonnets and purge valve	
*Not available with 4500 PSIG (310 BAR) inlet NOTE: Switching pressure must be higher than line regulator pressure selected in column C .	7: Diaphragm valves with 24" (600mm) hoses		*0-6000 PSIG/415 BAR gauges with 4500 PSIG (310 BAR) maximum inlet option †Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.			
	8: 36" (900mm) stainless steel flexible hoses and 4500 PSIG (310 BAR) maximum inlet pressure					
	9: 1/4" FPT ports and 4500 PSIG (310 BAR) maximum inlet pressure					
	<b>C:</b> Compact manifold connectors					
	<b>D:</b> Diaphragm valves with compact manifold connectors					

**Description**

The 530 Series Switchover is an automatic switchover system ideal for use in aerospace, parts cycle testing, or process and pilot plant pneumatic control where an uninterrupted supply of non-corrosive, non-oxidizing gas is required at high pressure. The system comes with options for multiple inlet configurations and can deliver substantial flow with stable line pressure up to 3500 PSIG (240 BAR). It is ideal for use with Nitrogen, Helium, Argon, or Hydrogen where cylinder fill pressures can be as high as 6000 PSIG (415 BAR).

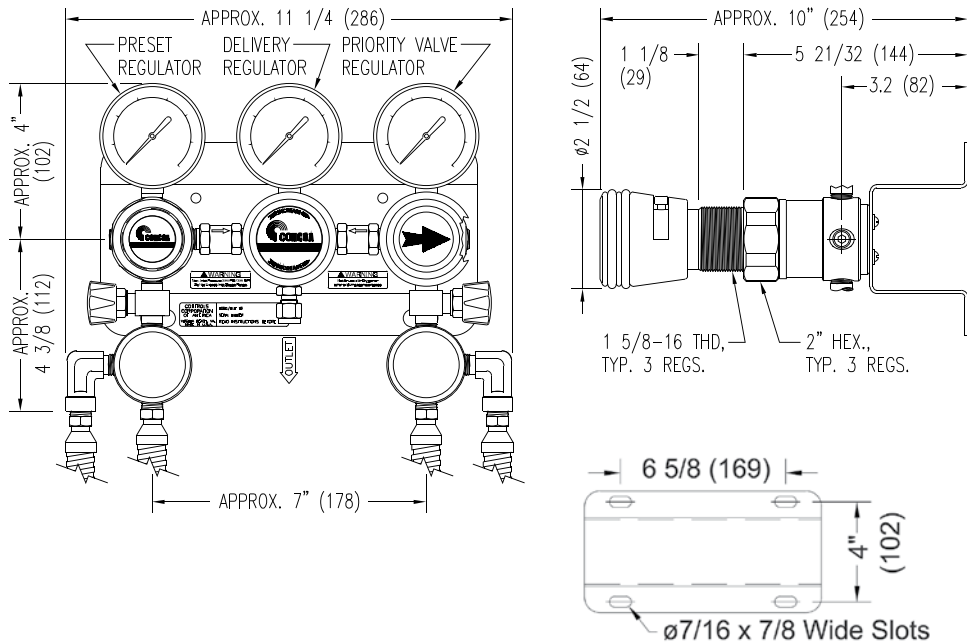
**Typical Applications**

- High delivery pressure gas systems
- Aerospace cycle testing
- Component Helium Leak testing
- Combustion research laboratories
- Synthetic fuel research and process plants
- High pressure Hydrogen
- High pressure air systems
- Plant pneumatic valve supply



Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <b>492 Series brass barstock regulators</b> Safely controls pressures to 6000 PSIG (415 BAR)</li> <li>• <b>User-Friendly</b> One knob switches cylinder priority</li> <li>• <b>Check valves in hose inlet glands</b> Prevents contamination and back flow</li> <li>• <b>Line Regulator</b> Stable line pressure up to 3500 PSIG (240 BAR) during change over</li> <li>• <b>Capsule® Seat</b> Increased serviceability and life</li> <li>• <b>Optional Remote Alarm</b> Easy integration with Advantium system CE marked universal voltage alarm</li> </ul>	<p><b>Bodies</b> Chrome-plated brass barstock</p> <p><b>Cartridges</b> Brass Barstock</p> <p><b>Seats</b> Arlon® (PEEK) switchover regulator PTFE line regulator</p> <p><b>Filters</b> 10 micron sintered bronze</p> <p><b>Internal Seals</b> Viton®</p> <p><b>Weight</b> 22.5lbs. (10.2 kg)</p> <p>Not for O<sub>2</sub></p>	<p><b>Inlet Pressure Available</b> 3000 PSIG (207 BAR) 4500 PSIG (310 BAR) 6000 PSIG (414 BAR)</p> <p><b>Temperature Range</b> -40°F to 140°F (-40°C to 60°C)</p> <p><b>Gauges</b> 2 1/2" (68mm) diameter chrome-plated brass (non-pressure switch models) 2 1/2" (68mm) diameter stainless steel (pressure switch models)</p> <p><b>Outlet Connection</b> 1/4" compression tube fitting</p> <p><b>Cv</b> 0.1</p>

## Installation Information



## Ordering Information

530	A	B		C	D	-CON
Series 530	Delivery Pressure	Max Inlet Pressure	Inlet Gauges	Inlet Connection	Assembly/Gauges	Hose
	1: 1000 PSIG (70 BAR)	1: 3000 PSIG (210 BAR)	4000 PSIG (275 BAR)	0: 1/4" FPT port	2: PSIG/BAR gauges with no alarm capability	Please specify inlet connection (if applicable)
	2: 1500 PSIG (100 BAR)	2: 4500 PSIG (310 BAR)	6000 PSIG/ (415 BAR)	1: Two needle valves with two 36" (900mm) flexible hoses (one station per side)	4: PSIG/BAR gauges with pressure switches† and remote alarm (110/220 VAC)	CGA DIN 477 BS 341 and others available
	3: 2500 PSIG (170 BAR)	3: 6000 PSIG (415 BAR)	10,000 PSIG/ (700 BAR)	2: Two needle valves with four 36" (900mm) flexible hoses (two stations per side)	†Intrinsic safety barriers are required for flammable gas service or for use in hazardous environments.	Not for use in Oxygen service.
	4: 3500 PSIG (240 BAR)			3: Manifold connectors 3000 PSIG (210 BAR) inlet only		

2 input remote manifold alarm

**Advantium 2 Remote Alarm**

**Features**

- High profile visible and audible notification
- Audible alarm silence function
- Two input channels and one output channel
- One general dry contact relay output
- NO or NC switch compatibility
- Auto-reset when cylinders are replenished



**Specifications**

- **Audio**  
93 db audible alarm
- **Power**  
120 VAC or 220 VAC
- **Relay Contact**  
Single pole, double throw (SPDT)
- **Relay Contact Rating**  
1A@24 VDC or .5A@120 VAC
- **Dimensions**  
3 1/4" x 6" x 2"
- **System Fuses**  
Internal resettable poly-fuse
- **Connections**  
Input connector (6-pin circular)  
Relay output connector (4-pin circular)
- **Intrinsic Safety Barriers**  
Required for flammable gas service or for use in hazardous environments

**Ordering Information**

Part Number	Description
529-5106-120	Single-System Remote Alarm (120V)
529-5106-220	Single-System Remote Alarm (220V)
529-5312	Intrinsic Safety Barriers for 526 or 527 Series Switchover Systems
529-5296	Intrinsic Safety Barriers for 522, 523, 536 or 537 AutoSwitch Systems

1 input remote manifold alarm

**Advantium 1 Remote Alarm**

**Features**

- High profile visible and audible notification
- Audible alarm silence function
- One input channel and one output channel
- One general dry contact relay output
- NO or NC switch compatibility
- Auto-reset when cylinders are replenished



**Specifications**

- **Audio**  
93 db audible alarm
- **Power**  
120 VAC or 220 VAC
- **Relay Contact**  
Single pole, double throw (SPDT)
- **Relay Contact Rating**  
1A@24 VDC or .5A@120 VAC
- **Dimensions**  
3 1/4" x 6" x 2"
- **System Fuses**  
Internal resettable poly-fuse
- **Connections**  
Input connector (6-pin circular)  
Relay output connector (4-pin circular)
- **Intrinsic Safety Barriers**  
Required for flammable gas service or for use in hazardous environments

**Ordering Information**

Part Number	Description
529-5135-120	Protocol Station Remote Alarm (120V)
529-5135-220	Protocol Station Remote Alarm (220V)
529-5313	Intrinsic Safety Barriers for Protocol Alarm Stations
	Contact CONCOA for pre-made patch cables

## Advantium 16 System Monitor

alarms

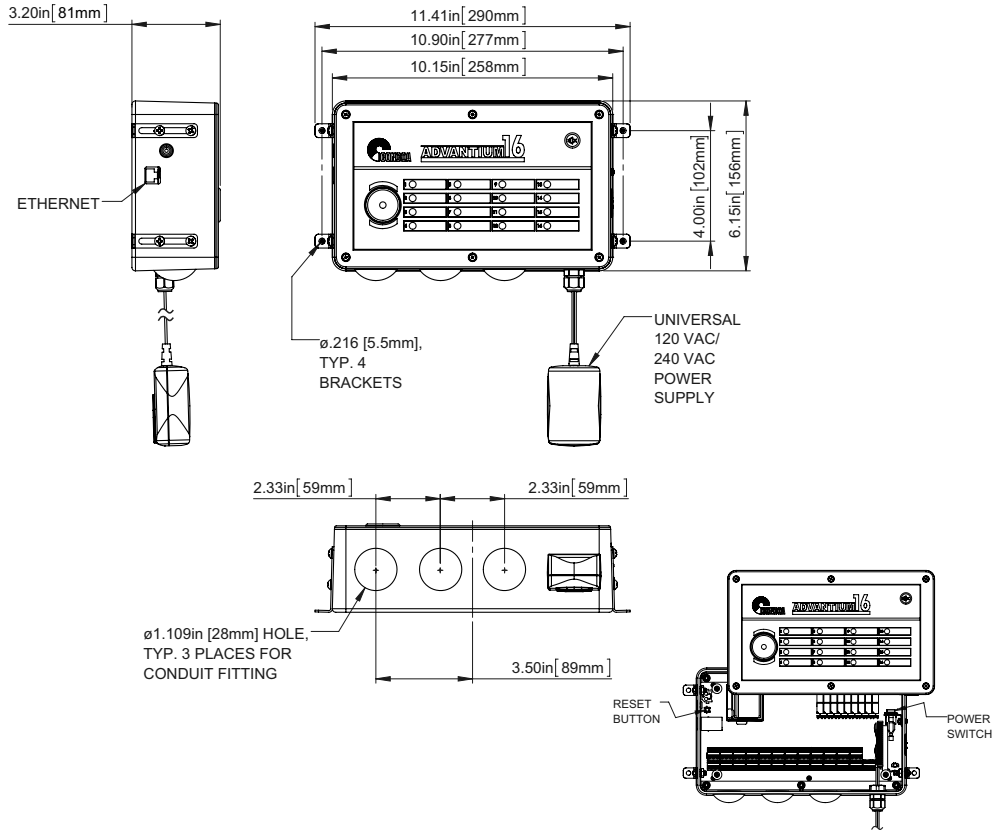
### Description

The CONCOA 575 Series system monitor reports and records the status of up to 16 individual points of observation. Ideal for monitoring automatic switchovers and other fail-safe gas delivery installations, inputs to the Advantium 16 may be grouped by sub-system for display and notification. The status of all inputs are displayed locally with high visibility, multicolor LEDs, turning red when an input exits its normal condition and blinking when all inputs in a user-defined system exit. Additionally, status may be accessed through user-programmable dry contact outputs, an integral web server, or e-mails sent by an on-board mail server based on user-defined triggers. Though capable of supporting any device with contact closure output relays, the highly configurable Advantium 16 is specifically designed for complex gas systems.



Features	Materials	Specifications
<ul style="list-style-type: none"> <li><i>Highly Programmable Monitor</i> Customize for specific installations</li> <li><i>User-Definable Input Groups</i> Support switchovers and third-leg reserves</li> <li><i>Reversible Mounting Brackets</i> Mount flush with or on surfaces</li> <li><i>Onboard Web and Mail Server</i> Enables remote monitoring and notification</li> <li><i>Eighteen Output Relays</i> Flexible system integration</li> <li><i>Event Log</i> Auditable trail of uptime and failure</li> </ul>	<p><i>Enclosure</i> Polycarbonate resin (flame retardant and UV stabilized)</p> <p><i>Cover Assembly</i> Screw closure</p> <p><i>Mounting Assembly</i> Steel flange</p> <p><i>Weight</i> 4.5 lbs. (2.04 kg)</p>	<p><i>Sound</i> 93 dB audible alarm</p> <p><i>Power Input</i> 90-264 VAC external power supply (US, UK, European, Australian, and Chinese adapters included)</p> <p><i>Dry Contact Outputs (18)</i> NO or NC (field adjustable)</p> <p><i>Relay Inputs (16)</i> NO or NC (field adjustable)</p> <p><i>Relay contact rating</i> .5 A@24V</p> <p><i>Ethernet</i> RJ-45</p>

Installation Dimensions



Ordering Information

Order No.	Description
575 0164	Advantium 16 system monitor

Options

Order No.	Description
575 9901	Flush mount kit for Advantium 16 including trim and hardware
529 5340-XX	Input cable assembly for all switchovers except AutoSwitch available in 3', 10', 25', 50' and 100' lengths. "XX" in order number denotes length.
529 5341-XX	Input cable assembly for regulators and backup panels available in 3', 10', 25', 50' and 100' lengths. "XX" in order number denotes length.
529 5342-XX	Input cable assembly for AutoSwitch systems available in 3', 10', 25', 50' and 100' lengths. "XX" in order number denotes length.
529 5343-XX	4-wire cables for intrinsic safety barriers available in 3', 10', 25', 50' and 100' lengths. "XX" in order number denotes length.
529 5344-XX	6-wire cables for intrinsic safety barriers available in 3', 10', 25', 50' and 100' lengths. "XX" in order number denotes length.
529 5312	Intrinsic safety barriers for all switchovers, regulators, and backup panels except AutoSwitch. 529 5296 Intrinsic safety barriers for AutoSwitch systems.



## Model 22660

mass spec distribution panel

4

### Description

This panel provides mass spec users with all the necessary gas handling equipment to properly install and operate their new mass spectrometer. The gas distribution panel provides all of the necessary controls to feed both air and nitrogen to the mass spec at the proper pressures for optimum operation. The valve arrangement provides the user with the option of using nitrogen for all the functions instead of air for the exhaust gas, Gas 1 and Gas 2 functions in the event that compressed air is not available. The panel is compact and easy to install. Simply mount the panel at a convenient location and connect your gas lines using the compression fittings provided.

### Features

- Total high purity gas construction.
- Brass high purity line regulators.
- HL3300-125-580 regulator included for LN2 container.
- Diaphragm valves.
- Valved for use with air and nitrogen or nitrogen only.
- 1/4" OD compression fitting outlet connections.
- 50 feet of 1/4" polyethylene tubing.
- System is mounted on a 23" high x 12" wide x 1/2" thick HDPE panel.



## Model 22687

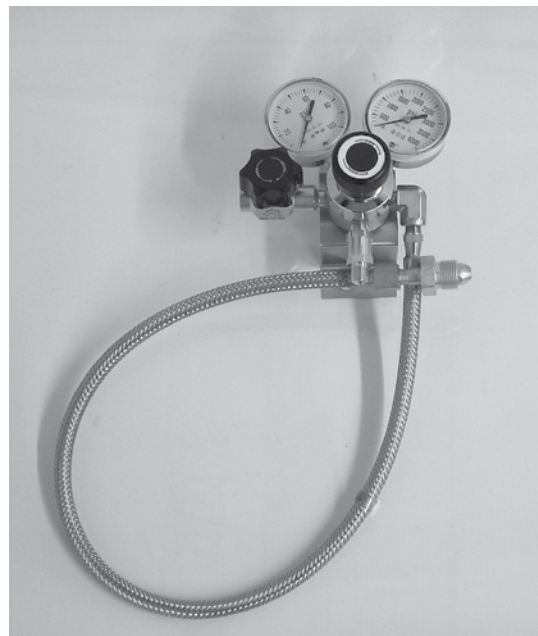
generator backup panel

### Description

This panel is designed to automatically provide a reserve supply to a gas generator in the event of a power loss, or the generator cannot provide sufficient gas to the system. The system may be used with air, hydrogen, or nitrogen generators and are available constructed of brass or stainless steel. An alarm option is available.

### Features

- High purity two stage regulator to ensure constant delivery pressure as required.
- Stainless steel inner core flexible 3' pigtails with cylinder connections having integral check valves.
- Protocol station mounting assembly.



multiple source panels

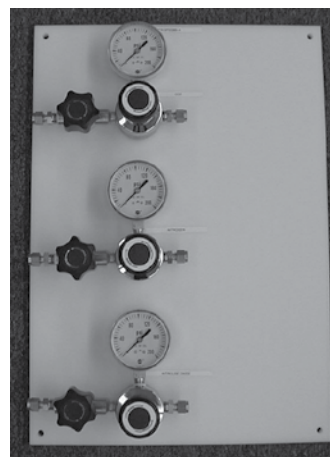
**Series 223**

4

Description
Point of use panels provide a convenient organized method to deliver gas to your laboratory instruments or systems whether from a single source or multiple sources while providing individual pressure control for each application.
Features
<ul style="list-style-type: none"> <li>• High purity brass or stainless steel line regulators.</li> <li>• Individual inlets and outlets for each regulator.</li> <li>• Horizontal or vertical configuration.</li> <li>• HDPE panel.</li> <li>• Inlet and outlet connections 1/4" stainless steel compression fittings.</li> </ul>



single regulator panel



three-regulator vertical panel configuration

Ordering Information	
223M-X- PPP	
M	= 1 for brass 4 for stainless steel
X	= H for horizontal configuration V for vertical configuration
Y	= number of regulators
C	= center inlet
PPP	= delivery pressure of each regulator on the panel. Show the range code for each regulator in order from top to bottom or left to right. 25 for 0-25 psig 50 for 0-50 psig 100 for 0-100 psig 150 for 0-150 psig

**Example:**  
2231-H-25-25-50-100 describes a brass four-regulator panel in the horizontal orientation with the first regulator on the left having a 0-25 psig delivery pressure range followed in order by three others: 0-25 psig, 0-50 psig, and 0-100 psig.



four-regulator horizontal panel configuration

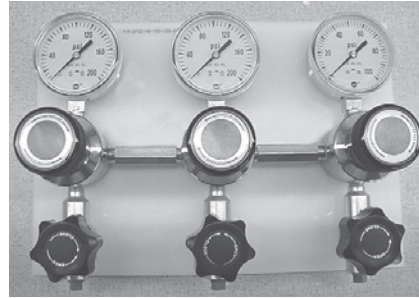
## Series 233

single source panels

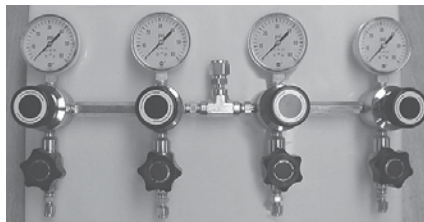
4

### Features

- High purity brass or stainless steel line regulators.
- One inlet with individual outlets for each regulator.
- Horizontal or vertical configuration.
- HDPE panel.
- Inlet and outlet connections 1/4" stainless steel compression fittings.



three-regulator panel - inlet may be from the left or right



four-regulator panel with center inlet

### Ordering Information

233M-X-PPP-C

M = 1 for brass  
4 for stainless steel

X = H for horizontal configuration  
V for vertical configuration

Y = number of regulators

C = center inlet

PPP = delivery pressure of each regulator on the panel.  
Show the range code for each regulator in order  
from top to bottom or left to right.  
25 for 0-25 psig  
50 for 0-50 psig  
100 for 0-100 psig  
150 for 0-150 psig

#### Example:

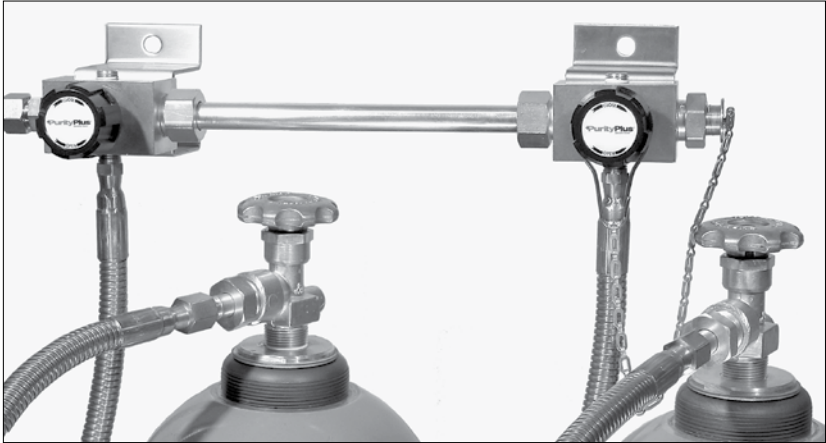
2331-H-25-25-50-100-C describes a center inlet brass four-regulator panel in the horizontal orientation, with the first regulator on the left having a 0-25 psig delivery pressure range followed in order by three others: 0-25 psig, 0-50 psig, and 0-100 psig.

maniflex, modular manifolds **52 Series**

4

**Description**

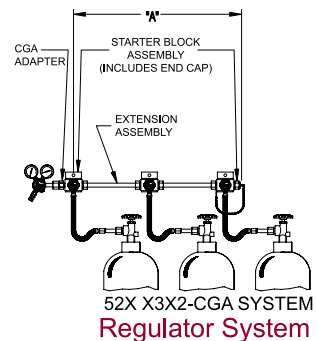
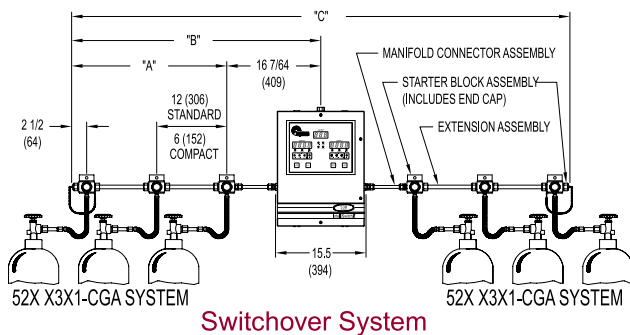
The 52B, 52C and 52S Series Maniflex are modular gasdistribution systems that may be connected to regulators, dual regulator switchovers, IntelliSwitch and AutoSwitch systems. A modular gas distribution system allows the user to size the inlet capacity of a system so that cylinder changes will not be as frequent. The Maniflex system provides the user with the capability of purchasing an unlimited number of manifold stations connected to a single header. The Maniflex headers themselves may be purchased as a complete system (unassembled) or as individual components



Features	Materials	Specifications
<p><i>Modular Design</i> Flexible field installation</p> <p><i>Integral Diaphragm Valves</i> Leak-tight integrity Independent shut-off capability</p> <p><i>Expandable System</i> Future growth capability</p> <p><i>Brass, Chrome-Plated Brass or Stainless Steel</i> Compatible with most gases</p> <p><i>Metal-to-Metal Field-Assembled Joints</i> Easy leak-tight field assembly Ease of transportation</p> <p><i>Silver-Brazed or TIG-Welded</i></p> <p><i>Connectors</i> Contamination-free installation</p>	<ul style="list-style-type: none"> <li>Diaphragm Valve Body: Brass or stainless steel barstock Seat: PCTFE Stems: 303/304 stainless steel Diaphragms: Elgiloy<sup>®</sup></li> <li>Flexible Hoses 316L stainless steel Monel<sup>®</sup> inner core for oxygen service</li> </ul>	<p><i>Maximum Inlet Pressure</i> 3500 PSIG (240 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40OC to 60OC)</p> <p><i>Header</i> 0.625 OD x 0.188 wall (Brass) 0.625 OD x 0.095 wall (Stainless steel)</p>

Dimensions ("A", "B", and "C" refer to the lengths specified on the diagram below.)

Cylinders per Side	1	2	3	4	5	6	7	8	9	10
"A" Standard (Single Row)	2.5"	14.5"	26.5"	38.5"	50.5"	62.5"	74.5"	86.5"	98.5"	110.5"
"B" Standard (Single Row)	18.6"	29.6"	42.6"	54.6"	66.6"	78.6"	90.6"	102.6"	114.6"	126.6"
"C" Standard (Single Row)	37.3"	59.3"	85.3"	109.3"	133.3"	157.3"	181.3"	205.3"	229.3"	253.3"
Weight Standard (Brass Single Row)	3.45 lbs	7.07 lbs	10.69 lbs	14.31 lbs	17.93 lbs	21.55 lbs	25.17 lbs	28.79 lbs	32.41 lbs	36.03 lbs
Weight Standard (SS Single Row)	3.33 lbs	6.45 lbs	9.57 lbs	12.69 lbs	15.81 lbs	18.93 lbs	22.05 lbs	25.17 lbs	28.29 lbs	31.41 lbs
"A" Compact (Single Row)	2.5"	8.5"	14.5"	20.5"	26.5"	32.5"	38.5"	44.5"	50.5"	56.5"
"B" Compact (Single Row)	18.6"	24.6"	29.6"	36.6"	42.6"	48.6"	54.6"	60.6"	66.6"	72.6"
"C" Compact (Single Row)	37.3"	49.3"	59.3"	73.3"	85.3"	97.3"	109.3"	121.3"	133.3"	145.3"
Weight Compact (Brass Single Row)	3.45 lbs	6.62 lbs	9.79 lbs	12.96 lbs	16.13 lbs	19.3 lbs	22.47 lbs	25.64 lbs	28.81 lbs	31.98 lbs
Weight Standard (SS Single Row)	3.33 lbs	6.27 lbs	9.21 lbs	12.15 lbs	15.09 lbs	18.03 lbs	20.97 lbs	23.91 lbs	26.85 lbs	29.79 lbs



## Ordering Information

52X	A	B	C	D	-CON
<b>Series</b>	<b>Orientation</b>	<b>Stations</b>	<b>Hose Style</b>	<b>Outlet Connection</b>	<b>Hose Connection</b>
52B Brass	1: Standard Single Row (right or left) (one cylinder/station)	0: 10 stations 1: 1 stations	0: None	1: 1/4" FPT Connection	CGA
52C Chrome-Plated Brass	2: Standard Double Row (right or left) (two cylinders/stations)	2: 2 stations 3: 3 stations	2: 24" Flexible 316 Stainless Steel with Check Valve	2: Cylinder Connection Adapter	DIN 477 BS 341 and others available
52S Stainless Steel	3: Standard Single Duplex (right and left) (one cylinder/station)	4: 4 stations 5: 5 stations	3: 36" Flexible 316 Stainless Steel with Check Valve		
	4: Compact Single Row (right or left) (one cylinder/station)	6: 6 stations 7: 7 stations	6: 72" Flexible 316 Stainless Steel with Check Valve		
	5: Compact Double Row (right or left) (two cylinders/stations)	8: 8 stations 9: 9 stations			
	6: Compact Single Duplex (right and left) (one cylinder/station)	A: 11 stations B: 12 stations C: 13 stations D: 14 stations E: 15 stations			

micromanifold **52L Series**

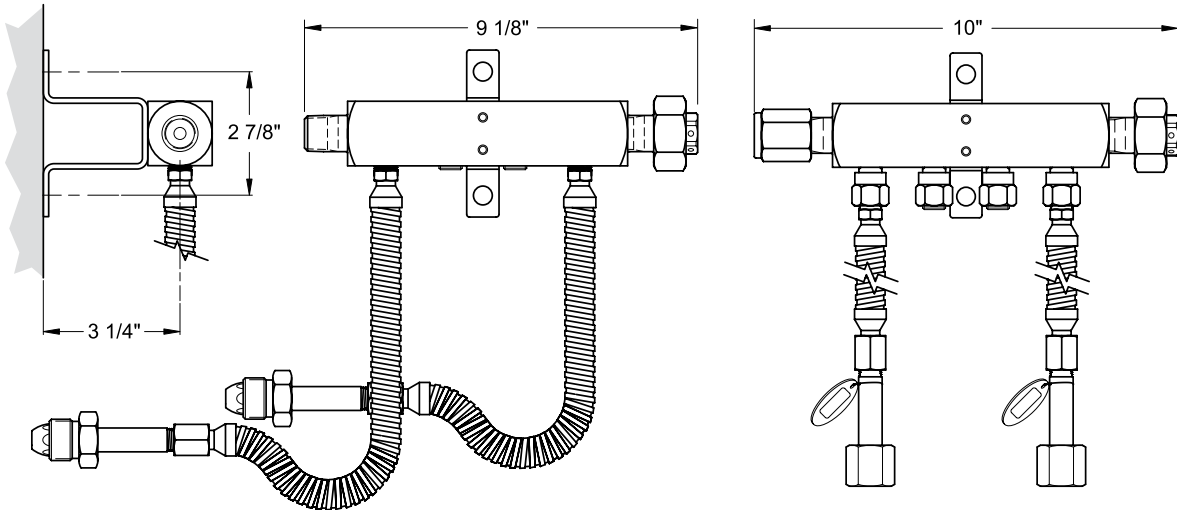
Description
<p>The 52L Series MicroManifold is a flexible non-corrosive gas distribution system that can be configured as a gas or vent manifold. Configured as a gas manifold, the 52L offers excellent gaseous flow capacity from either liquid cans or high-pressure cylinders to a CONCOA pressure control device. Configured as a vent manifold, the 52L equalizes the head space pressure of each liquid cylinder manifolded together. This allows each cylinder to withdraw equally and operate at maximum flow capacity with minimal losses.</p>
Advanced Features
<ul style="list-style-type: none"> <li>• Vent manifold excess flow orifices prevent hoses from whipping</li> <li>• Safety disk protects manifold from over-pressurization</li> <li>• Compact modular design provides simple field expandability</li> <li>• Multiple cylinder hose options with universal gas compatibility</li> <li>• Integrated 1/2" MPT connector that reduces potential leak sites</li> <li>• A flexible design that can be used with 538, 539, 542, and 544 series switchovers or as a vent kit for 577 cryogenic system.</li> </ul>



52L 1053-580 Shown

Features	Materials	Specifications
<p><i>Gas Delivery and Vent Manifold from Liquid Cylinder Supply</i> Argon, Carbon Dioxide, Nitrogen, and Oxygen</p> <p><i>Gas Delivery from High Pressure Cylinder Supply</i> Air, Argon, Carbon Dioxide, Helium, and Oxygen</p> <p><i>Expandable System</i> Future growth capability</p> <p><i>High Flow Gas Installations</i> Laboratory building main supply Large incubator installations High flow purge gas supply Bioreactor supply</p>	<ul style="list-style-type: none"> <li>• Body Brass or stainless steel barstock</li> <li>• Flexible Hoses 316L stainless steel Monel<sup>®</sup> inner core for oxygen service</li> </ul>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR) 4500 PSIG (310 BAR) Optional</p> <p><i>Temperature Range</i> 0°F to 140°F (-18OC to 60OC)</p> <p><i>Inlet Connection</i> Four 1/4" FPT One 1/2" FPT</p> <p><i>Outlet Connection</i> 1/2" MPT</p> <p><i>Weight (manifold and mounting bracket)</i> 4.20 lbs. (1.91 kg)</p>

## Dimensions



52L-1152-580 MicroManifold

52L-21A2-295 Vent MicroManifold

## Ordering Information

52L	A	B	C	D	Inlet
Series 52L	Manifold Type (Gauge)	Orientation	Hoses Style	Cylinder side	Connection
	1: Gas MicroManifold (No gauges)	0: Simplex right bank	0: No hose	1: One	Please specify inlet connection Use -001 for hoses option 0. CGA DIN 477 BS 341 and others available Use CGA 295, 440, or 622 for hose style A
	2: Vent MicroManifold (No gauges)	1: Simplex left bank	3: 72" (1800mm) flexible stainless steel core and armor cased	2: Two	
	3: Gas MicroManifold (0-400 PSIG/0-2500 kPa gauges)	2: Duplex right and left bank	5: 36" (900mm) flexible stainless steel core and armor cased**	3: Three	
	4: Gas MicroManifold (0-600 PSIG/0-40 BAR gauges)	3: Simplex right bank with pressure switch gauge*	7: 24" (600mm) flexible stainless steel core and armor cased**	4: Four	
	5: Gas MicroManifold (0-4000 PSIG/0-2500 kPa gauges)	4: Simplex left bank with pressure switch gauge	A: 72" (1800mm) flexible PTFE-lined, stainless steel braided for liquid cylinder vent use†	5: Five	
	6: Gas MicroManifold (0-4000 PSIG/0-280 BAR gauges)	5: Duplex right and left bank with pressure switch gauge*	K: 72" (1800mm) stainless steel core and armor cased††	6: Six	
	7: Gas MicroManifold (0-6000 PSIG/0-40,000 kPa gauges)	*Valid with A = 4, 6, and 8	L: 36" (900mm) stainless steel core and armor cased††	7: Seven	
	8: Gas MicroManifold (0-6000 PSIG/0-420 BAR)		**Valid with A = 1, 3, 4, 5, and 6 †Valid with A = 2 ††Valid with A = 1, 7, and 8	8: Eight	
				0: Zero	

## Options and Hoses

Option	Order Number	Description
Burst Disk Kit	829-9960	1/2" MPT replacement burst disk kit
Floor Stand	830-7437	Single manifold floor stand provides support for up to two consecutive manifold extensions

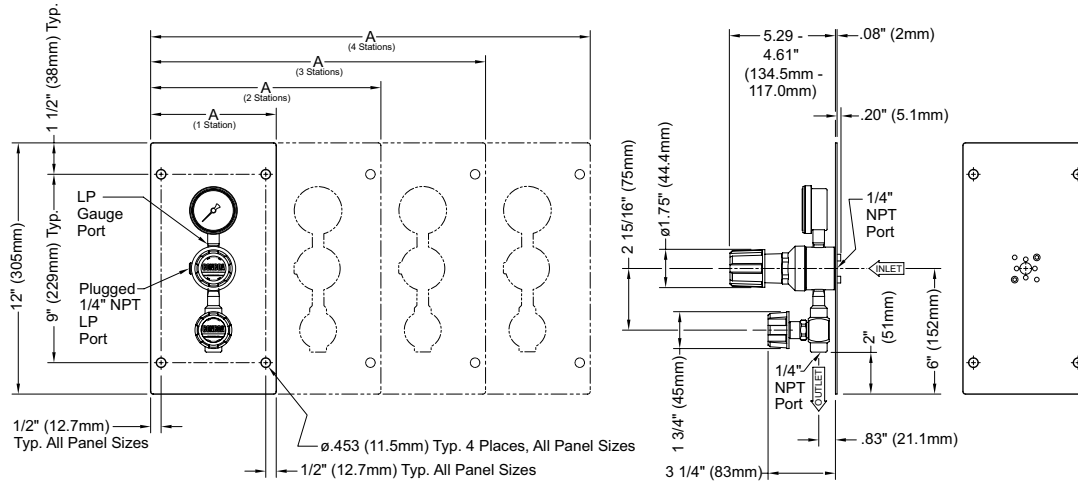
Description
<p>The 53 Series Point-of-Use Panels provide a modular design to mount and locate 300 Series regulators at the point of use for high purity instrumentation or process gases. They are intended to provide final pressure control in gas distribution systems and are ideal for laboratory applications. The 53 Series are supplied with up to four high-purity regulators with rear entry inlet ports and diaphragm outlet valves. Five standard delivery pressure ranges can be individually selected for each regulator station 0-15 PSIG (0-1 BAR) to 0-200 PSIG (0-14 BAR).</p>
Typical Applications
<ul style="list-style-type: none"> <li>• Bulk gas distribution systems</li> <li>• Gas and liquid chromatography</li> <li>• High purity carrier gases</li> <li>• Zero, span, and calibration gases</li> <li>• High purity chamber pressurization</li> <li>• Liquefied hydrocarbon gas control</li> <li>• Control of cryogenic gases</li> <li>• EPA protocol standards</li> </ul>



Features	Materials	Specifications
<p><i>307 or 327 Series Regulators</i> High gas purity</p> <p><i>Modular Design</i> Flexible installation</p> <p><i>Rear Entry Regulator Inlet Ports</i> Piping behind panel</p> <p><i>Five Individually Selectable Pressure Ranges</i> 0-15 to 0-200 PSIG (0-1 to 0-14 BAR)</p> <p><i>14 Gauge Stainless Steel Pane</i> Clean corrosion resistant installation</p> <p><i>Stainless Steel Diaphragm</i> No inboard diffusion</p> <p><i>High-Purity Diaphragm Outlet Valve</i> Gas flow control and positive shut-off</p>	<ul style="list-style-type: none"> <li>• Regulator and Valve Body 316L stainless steel or chrome-plated brass barstock</li> <li>• Bonnet Chrome-plated brass barstock</li> <li>• Seats PTFE on regulator PCTFE on valve</li> <li>• Filter Patented 10 micron 316 mesh or sintered bronze</li> <li>• Diaphragm 316L stainless steel</li> <li>• Internal Seals PTFE</li> </ul>	<p><i>Maximum Inlet Pressure</i> 3000 PSIG (210 BAR)</p> <p><i>Temperature Range</i> -40°F to 140°F (-40°C to 60°C)</p> <p><i>Cv</i> 0.1</p> <p><i>Inlet/Outlet Connection</i> 1/4" NPT female</p> <p><i>Gauges</i></p> <p>53C Chrome-plated stem Phosphor bronze tube 2" (53mm) brass case</p> <p>53S Stainless steel stem Stainless steel tube 2" (53mm) stainless steel case</p> <p><i>Panel</i> 14-gauge 304 stainless steel</p>



## Installation Dimensions



## Ordering Information

53	Material	Station 1		Station 2		Station 3		Station 4	
Series 53		Outlet Pressure	Outlet Gauge	Outlet Pressure	Outlet Gauge	Outlet Pressure	Outlet Gauge	Outlet Pressure	Outlet Gauge
	<b>C:</b> Chrome-plated brass barstock 307 Series regulators	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/0-200 kPa	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/0-200 kPa	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/0-200 kPa	1: 0-15 PSIG (0-1 BAR)	0-30 PSIG/0-200 kPa
	<b>S:</b> 316L stainless steel 327 Series regulators	A: 0-15 PSIG (0-1 BAR)	0-2 BAR/0-30 PSIG	A: 0-15 PSIG (0-1 BAR)	0-2 BAR/0-30 PSIG	A: 0-15 PSIG (0-1 BAR)	0-2 BAR/0-30 PSIG	A: 0-15 PSIG (0-1 BAR)	0-2 BAR/0-30 PSIG
		2: 0-30 PSIG (0-2 BAR)	0-60 PSIG/0-400 kPa	2: 0-30 PSIG (0-2 BAR)	0-60 PSIG/0-400 kPa	2: 0-30 PSIG (0-2 BAR)	0-60 PSIG/0-400 kPa	2: 0-30 PSIG (0-2 BAR)	0-60 PSIG/0-400 kPa
		B: 0-30 PSIG (0-2 BAR)	0-4 BAR/0-60 PSIG	B: 0-30 PSIG (0-2 BAR)	0-4 BAR/0-60 PSIG	B: 0-30 PSIG (0-2 BAR)	0-4 BAR/0-60 PSIG	B: 0-30 PSIG (0-2 BAR)	0-4 BAR/0-60 PSIG
		3: 0-50 PSIG (0-3.5 BAR)	0-100 PSIG/0-700 kPa	3: 0-50 PSIG (0-3.5 BAR)	0-100 PSIG/0-700 kPa	3: 0-50 PSIG (0-3.5 BAR)	0-100 PSIG/0-700 kPa	3: 0-50 PSIG (0-3.5 BAR)	0-100 PSIG/0-700 kPa
		C: 0-50 PSIG (0-3.5 BAR)	0-7 BAR/0-100 PSIG	C: 0-50 PSIG (0-3.5 BAR)	0-7 BAR/0-100 PSIG	C: 0-50 PSIG (0-3.5 BAR)	0-7 BAR/0-100 PSIG	C: 0-50 PSIG (0-3.5 BAR)	0-7 BAR/0-100 PSIG
		4: 0-150 PSIG (0-10 BAR)	0-200 PSIG/0-1400 kPa	4: 0-150 PSIG (0-10 BAR)	0-200 PSIG/0-1400 kPa	4: 0-150 PSIG (0-10 BAR)	0-200 PSIG/0-1400 kPa	4: 0-150 PSIG (0-10 BAR)	0-200 PSIG/0-1400 kPa
		D: 0-150 PSIG (0-10 BAR)	0-14 BAR/0-200 PSIG	D: 0-150 PSIG (0-10 BAR)	0-14 BAR/0-200 PSIG	D: 0-150 PSIG (0-10 BAR)	0-14 BAR/0-200 PSIG	D: 0-150 PSIG (0-10 BAR)	0-14 BAR/0-200 PSIG
		5: 0-100 PSIG (0-7 BAR)	0-200 PSIG/0-1400 kPa	5: 0-100 PSIG (0-7 BAR)	0-200 PSIG/0-1400 kPa	5: 0-100 PSIG (0-7 BAR)	0-200 PSIG/0-1400 kPa	5: 0-100 PSIG (0-7 BAR)	0-200 PSIG/0-1400 kPa
		E: 0-100 PSIG (7 BAR)	0-14 BAR/0-200 PSIG	E: 0-100 PSIG (7 BAR)	0-14 BAR/0-200 PSIG	E: 0-100 PSIG (7 BAR)	0-14 BAR/0-200 PSIG	E: 0-100 PSIG (7 BAR)	0-14 BAR/0-200 PSIG
		6: 0-200 PSIG (0-14 BAR)	0-400 PSIG/0-2800 kPa	6: 0-200 PSIG (0-14 BAR)	0-400 PSIG/0-2800 kPa	6: 0-200 PSIG (0-14 BAR)	0-400 PSIG/0-2800 kPa	6: 0-200 PSIG (0-14 BAR)	0-400 PSIG/0-2800 kPa
		F: 0-200 PSIG (0-14 BAR)	0-28 BAR/0-400 PSIG	F: 0-200 PSIG (0-14 BAR)	0-28 BAR/0-400 PSIG	F: 0-200 PSIG (0-14 BAR)	0-28 BAR/0-400 PSIG	F: 0-200 PSIG (0-14 BAR)	0-28 BAR/0-400 PSIG

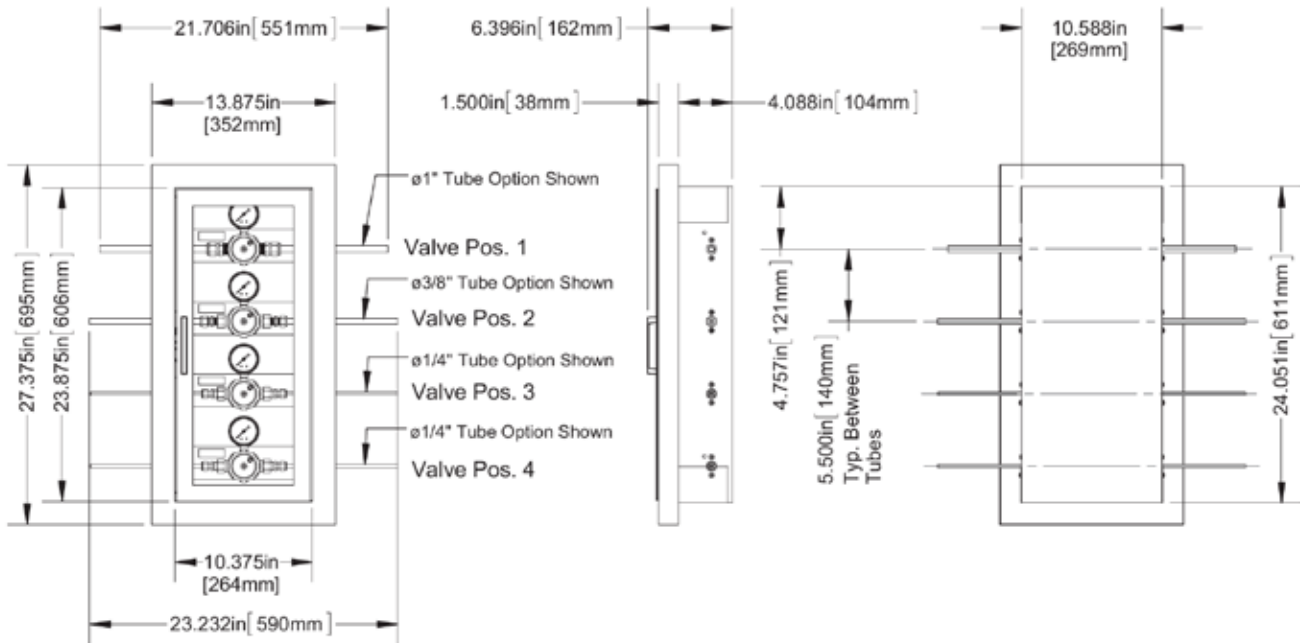
panels **5ZV Series**

4

Description
<p>The 5ZV Series high purity zone valve box provides branch control for large distribution systems in laboratories and other facilities that require high purity gases. Each high flow, stainless steel valve uses a metal-to-metal diaphragm seal to achieve leak rate suitable for up to grade 6.0 gases. The large window provides high visibility to the flow and pressure status of each gas pipeline. Valves may be in either position with the door closed, accommodating changes in laboratory gas requirements without disruption. Each unit is shipped with tubes to facilitate permanent joints outside the box; compression tube fitting connections at each valve allow easy maintenance in the unlikely event of a failure. Available in a vented configuration suitable for intermediate control of high purity, flammable gases, the 5ZV Series zone valve box provides flexible and convenient control for larger university and hospital laboratory environments.</p>



Materials	Features	Specifications
<p><b>Enclosure</b> Cold rolled steel with powder-coated finish</p> <p><b>Window</b> Transparent polycarbonate (3/32")</p> <p><b>Indicating Handle</b> Acrylonite butadiene styrene (ABS)</p> <p><b>Valve Body</b> 316 stainless steel barstock</p> <p><b>Valve Bonnet</b> 303 stainless steel barstock</p> <p><b>Valve Diaphragm</b> 316L stainless steel</p> <p><b>Valve Seat</b> PCTFE</p>	<p><b>Metal-to-Metal Diaphragm Seal</b> No possibility of gas contamination</p> <p><b>Stainless Steel Barstock Construction</b> Compatible with most high purity gases</p> <p><b>Large Transparent Window</b> High visibility of pressure and flow status</p> <p><b>Reversible Hinged Door</b> Quick access and flexible installation</p> <p><b>Compression Tube Fitting Connections</b> Easy maintenance</p> <p><b>Vented Enclosure Option</b> Suitable for use with flammable gases</p>	<p><b>Maximum Inlet Pressure</b> 500 PSIG (34 BAR)</p> <p><b>Temperature Range</b> -15°F to 125°F (-25°C to 50°C)</p> <p><b>Valve Ports</b> 1/2" FPT (process) 1/4" FPT (gauge)</p> <p><b>Cv</b> 1.2</p> <p><b>Helium Leak Integrity</b> 1 x 10<sup>-8</sup> scc/sec</p>



## Ordering Information and Configuration Options

5ZV	A	B	C	D	E	F	G	H	I
Series 5ZV	Assembly	Valve 1 options	Valve 1 gauge options	Valve 2 options	Valve 2 gauge options	Valve 3 options	Valve 3 gauge options	Valve 4 options	Valve 4 gauge options
	1: Right inlet Left outlet Non-vent enclosure Right hinge	A: Right inlet Left outlet Non-vent enclosure Left hinge	(See below)	(See below)	(See below)	(See below)	(See below)	(See below)	(See below)
	2: Left inlet Right outlet Non-vent enclosure Right hinge	B: Left inlet Right outlet Non-vent enclosure Left hinge	<b>Valve Options</b>			<b>Gauge Options</b>			
	6: Right inlet Left outlet Vented enclosure Right hinge	F: Right inlet Left outlet Vented enclosure Left hinge	0: No valve	1: 1/4" stainless compression tube fittings with stainless tubes	2: 3/8" stainless compression tube fittings with stainless tubes	3: 1/2" stainless compression tube fittings with stainless tubes	A: 0-2 BAR/0-30 PSIG	B: VAC-0-7 BAR/0-100 PSIG	C: VAC-0-14 BAR/0-1 PSIG
	7: Left inlet Right outlet Vented enclosure Right hinge	G: Left inlet Right outlet Vented enclosure Left hinge	A: 1/4" brass compression tube fittings with copper tubes	B: 3/8" brass compression tube fittings with copper tubes	C: 1/2" brass compression tube fittings with copper tubes	0: No gauge in valve	D: 0-21 BAR/0-300 PSIG	E: 0-28 BAR/0-400 PSIG	F: 0-70 BAR/0-1000 PSIG
						1: VAC-0-30 PSIG/0-200 kPa	G: 0-600 PSIG/0-40 BAR		
						2: VAC-0-100 PSIG/0-700 kPa			
						3: VAC-0-200 PSIG/0-1400 kPa			
						4: 0-300 PSIG/0-2000 kPa			
						5: 0-400 PSIG/0-2800 kPa			
						6: 0-1000 PSIG/0-7000 kPa			

**Leak-Tector™ Testing Solution**

4



Description	Specifications
<p>Leak-Tector is specially formulated for testing lines, cylinders, and systems carrying oxygen and other compressed gases for leaks. The formulation contains no oil, grease fatty acids, ammonias, or any other ingredient that could combine with pure oxygen to form either a flammable or explosive mixture.</p> <p>Leak-Tector is simple to use. Apply the solution to a connection or surface suspected of leaking and watch for bubble clusters. Large leaks form large bubble clusters. Very fine leaks form white foam that builds up for several minutes, making detection easy and certain. Solution dries clean with no greasy residue and does not need to be removed after testing. Tests have shown that Leak-Tector clearly detects leaks as small as one pound of gas in 100 years, a leak rate of <math>1.16 \times 10^{-4}</math>cc/sec of nitrogen.</p>	<p><i>Temperature range</i> +35° to +160°F</p> <p><i>Meets Air Force Spec.</i> MIL-L-25567</p>

Ordering Information	
Model Number	Description
LT-8	8 oz squeeze bottle of Leak-Tector
LT-8X12	case of 12 8 oz bottles of Leak-Tector
LT-1G	one gallon bottle of Leak-Tector
LT-1GX4	case of four one gallon bottle of Leak-Tector

## Flowmeter Tutorial

4

Flowmeters are used to measure the rate of flow of liquids or gases. They do not control the rate of flow unless they are equipped with a control valve or flow controller. There are two basic types of flowmeters; rotameters and electronic mass flowmeters.

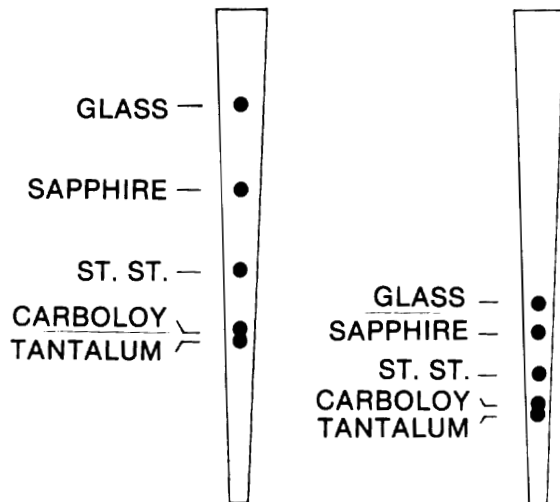
### ROTAMETERS

Rotameters are a simple, precise and economical way to measure flow rates. They consist of a precision tapered glass tube containing one or more spherical floats. A measuring scale is etched on the glass tube. The diameter of the tube at the bottom, or inlet is approximately equal to the diameter of the float.

As fluid enters the tube, the float rises to a point where the area between the float and the tube wall is large enough to permit unrestricted flow, and the float is stationary. This position corresponds to a point on the tube scale and thus permits a reading of the rate of flow.

The capacity, or flow range of a tube can be varied by changing the float material. Materials of a lower density such as pyrex glass or sapphire give a lower flow capacity than materials of a higher density like tantalum or stainless steel (see Figure 1).

Rotameters, unlike mass flowmeters, are affected by temperature and pressure variation (see Figure 2.) When equipped with a control valve on the inlet, readings are correct as long as the outlet pressure is equal to the pressure at which the tube was calibrated. When a valve is installed on the outlet, the tube calibration pressure must match the inlet pressure to the flowmeter unit.



**Figure 1**  
Relative positions of floats of various densities for the same rate of flow with 1 atmosphere outlet pressure.

**Figure 2**  
Effect of float position for the same rate of flow in Figure 1, but with increased pressure at the flowmeter outlet.

high resolution flowmeter

**Series 7920**

4

**Description**

The 7920 flowmeters provide the most accurate indication and precise control of fluids available for a wide range of applications. This versatile meter is functionally and dimensionally interchangeable with other current designs while incorporating many innovative features.

All 7920 glass metering tubes have integral float guides to assure the accuracy of  $\pm 5\%$  of full scale. Glass and stainless steel floats are standard. The meters are available in a wide range of flows.

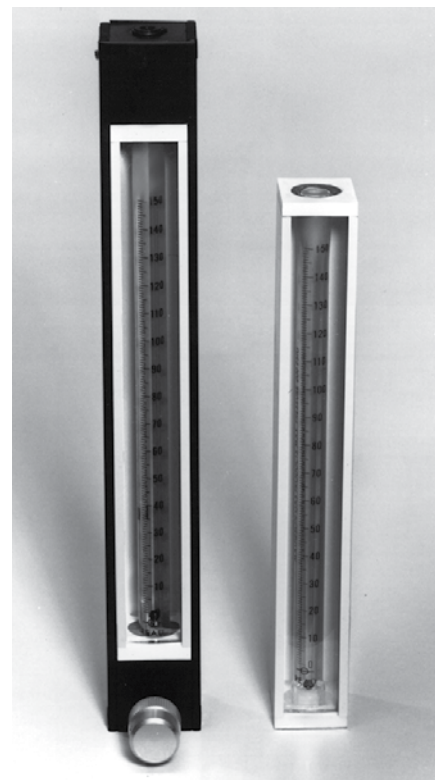
Standard with this series is the TUBE-CUBE™, a unique, design concept. The “cube”, a unitized tube holder, aligns the tube quickly and easily for a simple tube installation or replacement, reduces chipped tube ends, broken tubes, and misalignment. The TUBE-CUBE™ also provides tube protection during handling and storage and affords a 1.5 X scale magnification factor for more accurate tube reading. End seals in the design are direct-acting and non-rotating for fast alignment and convenient service access.

**Design Features**

- High resolution 150mm scale length
- Many standard direct reading scales available
- Precision taper, fluted metering tube
- Lowest available pressure drop via maximum flow path area increases available flow rates at low feed pressures
- Standard front panel mounting requires minimum hardware - easy installation, quick access.
- Available utility and high precision metering valves do not require special fittings
- Simplified; direct acting non-rotating compression seal

**Applications**

- Carrier and fuel gas chromatography
- Atomic absorption
- Semiconductor manufacture
- Chemical processing
- General research and industrial uses



**Materials**

*End Blocks*  
Chrome plated brass, 316 stainless, or Monel®

*“O” Rings & packing*  
Viton® - standard  
Buna-N, EPR rubber and Teflon are available options

*Side Plates*  
Anodized Aluminum

**Specifications**

*Maximum Pressure*  
250 psig

*Temperature Range*  
-20°F to +250°F  
-30°C to 120°C

*Accuracy*  
 $\pm 5\%$  of full scale

*Repeatability*  
 $\pm 0.25\%$  of scale reading

## Series 7920 (cont.)

Model	Material	Valve Type
B7920*	Brass	None
B7920V*	Brass	Standard
B7920HA*	Brass	High Accuracy
S7920	316 Stainless Steel	None
S7920V*	316 Stainless Steel	Standard
S7920HA*	316 Stainless Steel	High Accuracy
M7920*	Monel®	None
M7920V*	Monel®	Standard

\* Each model includes one tube from the table below; specify your choice when ordering.

Ordering Information	
Model - X - Y	
X=tube required Y=optional fittings	1, 2, 3, 4, 5, 6, 7, 8, 10 HB=hose barbs P4FF=1/4" NPT female T4FF=1/4" compression T2FF=1/8" compression
Example:	B7920V-2-T4FF is a brass unit with a 7920-2 flow tube and 1/4" compression fittings on inlet and outlet.

Options	P/N Suffix
· 1/4" NPT female inlet & outlet	P4FF
· 1/4" hose barbs inlet and outlet - add suffix "HB"	HB
· 1/4" compression tube fittings inlet and outlet	T4FF
· 1/8" compression tube fittings inlet and outlet	T2FF
<b>Bench stand - Model 7920B</b>	
<b>Eagle Eye Alarm - Model 7926-AVA**</b> (Requires special modified unit - add prefix "EE" to model number)	

## Flowmeter Tubes in TUBE-CUBE®

Model	Typical Flow Range*		
	Float	Air scc/min.	Water cc./min.
7920-1	Glass	3 - 56	0.04 - 0.66
	St. Steel	11 - 158	0.12 - 3.18
7920-2	Glass	6 - 91	0.08 - 1.0
	St. Steel	16 - 271	0.17 - 5.5
7920-3	Glass	22 - 388	0.24 - 7.8
	St. Steel	63 - 845	0.68 - 17
7920-4	Glass	64 - 847	1 - 17
	St. Steel	217 - 1707	2 - 46
7920-5	Glass	550 - 2560	6 - 54
	St. Steel	1070 - 5080	21 - 135
7920-6	Glass	610 - 3830	9 - 89
	St. Steel	1330 - 7670	30 - 217
7920-7	Glass	820 - 8610	14 - 200
	St. Steel	2090 - 16580	53 - 482
7920-8	Glass	2220 - 24920	47 - 568
	St. Steel	4190 - 45940	102 - 1319
7920-10	Glass	1.0 - 100	

\*Actual flow rates will vary from one manufacturing lot to another. Calibration data is supplied for each tube shipped.

Selected Correction Factors	
flow = air flow x correction factor	
Gas	Correction Factors
air	1.00
acetylene	1.054
ammonia	1.304
argon	0.851
n-butane	0.706
carbon dioxide	0.811
carbon monoxide	1.017
ethane	0.981
ethylene	1.016
helium	2.689
hydrogen	3.810
methane	1.343
nitrogen	1.017
nitrous oxide	0.811
oxygen	0.951
propane	0.810

**Description**

The gas proportioner meters the flow of each of two gases and mixes them thoroughly in a special mixing tube to produce homogeneous two-component mixtures.

Concentration accuracies of 10% of component value are maintained with a standard unit using typical calibration curves. (In a desired mixture of 1% gas A and 99% of gas B, a concentration between .9% and 1.1% is maintained.) Individual units can be calibrated for non-corrosive gases to attain an accuracy of 5% of the component value. Individual calibration curves are supplied with these specially calibrated units.

The control valves are installed at the outlets making these gas proportioners back pressure compensated. The readings on the tubes are accurate regardless of the down-stream pressure, so long as the inlet pressures are maintained at the levels for which the tubes were calibrated.

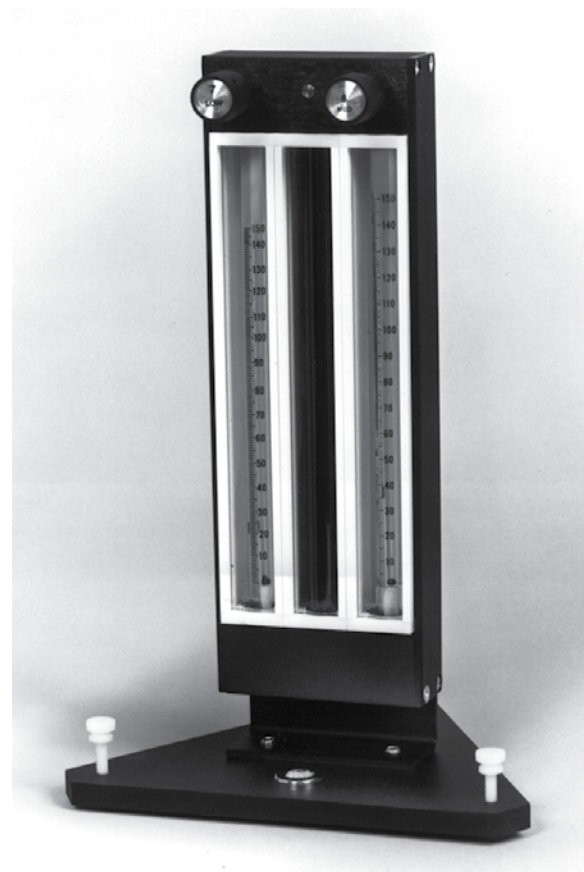
The unit is recommended for 50 psig pressure but can be used at any pressure between 10 and 200 psi.\*

These proportioners are available in both aluminum and stainless steel construction. When ordering a gas proportioner, specify the composition of the desired mixture, the gases, the discharge rate, and inlet pressure in addition to the model number.

\*For best performance, it is recommended that tubes have only one float.

**How to order**

All models include baseplate, mixing tube and two flowmeter tubes of your choice. If unsure of correct tubes, provide the composition range of intended mixtures, total outlet flow and operating inlet pressure. We will select the tubes.



Model	Material	Valve	Connections
7951	Aluminum	Standard	1/8" NPT female
7951H	Aluminum	Standard	1/4" hose barb
7951T	Aluminum	Standard	1/4" compression
7952	Aluminum	High Accuracy	1/8" NPT female
7952H	Aluminum	High Accuracy	1/4" hose barb
7952T	Aluminum	High Accuracy	1/4" compression
7953	Stainless Steel	Standard	1/8" NPT female
7953H	Stainless Steel	Standard	1/4" hose barb
7953T	Stainless Steel	Standard	1/4" compression
7954	Stainless Steel	High Accuracy	1/8" NPT female
7954H	Stainless Steel	High Accuracy	1/4" hose barb
7954T	Stainless Steel	High Accuracy	1/4" compression



## Series 7974 & 7975

large flow acrylic flowmeters

4

### Description

The Series 7974 and 7975 acrylic flowmeters are useful in a wide variety of applications involving non-corrosive gases where flow rates exceed those of traditional laboratory models. All units have direct reading scales in either liters/minute or cubic feet/minute of air. Correction factors for other gases can be provided.



Series 7974



Series 7975

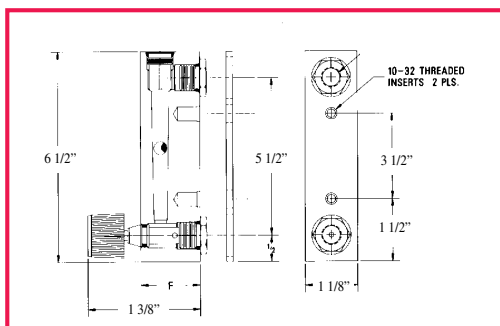
Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• Easy to read scales.</li> <li>• Air ranges from 14 lpm to 3400 lpm (0.5 to 100 scfm)</li> <li>• Durable one-piece clear acrylic construction</li> <li>• Optional built-in cartridge type valve available</li> </ul>	<p><b>Body</b> clear acrylic</p> <p><b>Fittings</b> 7974 series - brass 7975 series - PVC</p> <p><b>Valve</b> brass</p> <p><b>Seals</b> Buna-N</p>	<p><b>Max. Operating Pressure</b> 100 psig</p> <p><b>Operating Temperature Range</b> 0° to +150°F</p> <p><b>Body Inlet and Outlet</b> 7974 - 1/4" NPT female 7975 - 1" NPT female</p> <p><b>Accuracy</b> 7974 Series - +3% of full scale 7975 Series - +2% of full scale</p>

### Ordering Information

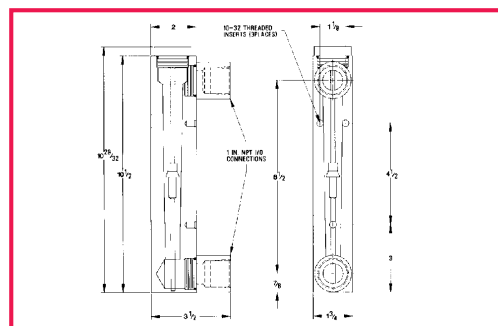
Model Number	Flow Range	Model Number	Flow Range
B7974-1	0.5 - 5.0 SCFM	7975-1	3 - 25 SCFM
B7974-2	1 - 10 SCFM	7975-2	4 - 50 SCFM
B7974-3	2 - 20 SCFM	7975-3	10 - 100 SCFM
B7974-4	14 - 140 lpm	7975-4	100 - 700 lpm
B7974-5	30 - 280 lpm	7975-5	100 - 1400 lpm
B7974-6	60 - 560 lpm	7975-6	400 - 3400 lpm

Option: Inlet needle valve - add suffix "V" to model number, i.e. 7974V-1

Option: Inlet needle valve - add suffix "V" to model number, i.e. 7975V-1



Series 7974



Series 7975

economic acrylic flowmeter

**Series 7923**

**Description**

The Series 7923 acrylic flowmeters are an ideal low cost tool for measuring flow rates of inert and non-reactive gases. The 1/8" female standard inlet and outlet connections are contained in brass inserts to ensure a secure leak-free connection to prevent cracking of the acrylic body. A needle valve to control the flow rate is included.

**Specifications**

*Maximum inlet pressure*  
100 psig

*Maximum operating temperature*  
150°F

*Dimensions*  
1" wide x 4" high x 2 1/8" deep

*Accuracy*  
+5% full scale

*Repeatability*  
+1% of scale reading

*Inlet and Outlet*  
1/8" NPT female standard on 3" centers

*Seals*  
Buna-N



**Options**

- 1/4" hose barbs inlet and outlet - add suffix "HB"
- 1/4" compression tube fittings inlet and outlet - add suffix "T4FF"
- 1/8" compression tube fittings inlet and outlet - add suffix "T2FF"
- 7923-AVA alarm

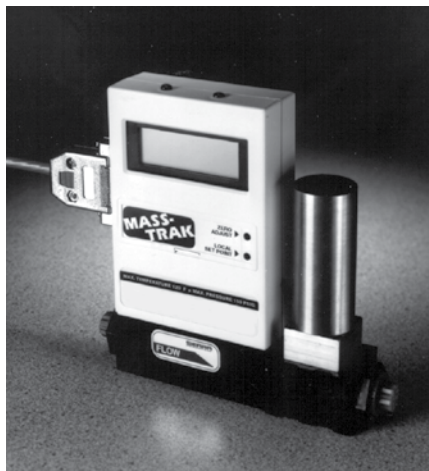
Model	Flow Range (SCFH Air)	Float
7923-2A00	0.1 - 1 SCFH	glass
7923-2A01	0.2 - 2 SCFH	SS
7923-2A02	0.5 - 5 SCFH	glass
7923-2A03	0.5 - 10 SCFH	glass
7923-2A04	2 - 20 SCFH	SS
7923-2A05	3 - 30 SCFH	SS
7923-2A06	4 - 50 SCFH	glass
7923-2A07	10 - 100 SCFH	SS
7923-2A08	20 - 200 SCFH	SS
7923-2A12	0.04 - 0.5 slpm	glass
7923-2A13	0.1 - 1.0 slpm	SS
7923-2A29	0.2 - 2.5 slpm	glass
7923-2A14	0.4 - 5.0 slpm	glass
7923-2A15	1 - 10.0 slpm	SS
7923-2A16	2 - 25 slpm	glass
7923-2A17	4 - 50 slpm	SS
7923-2A18	10 - 100 slpm	SS

4

## Series 810C Mass-Trak

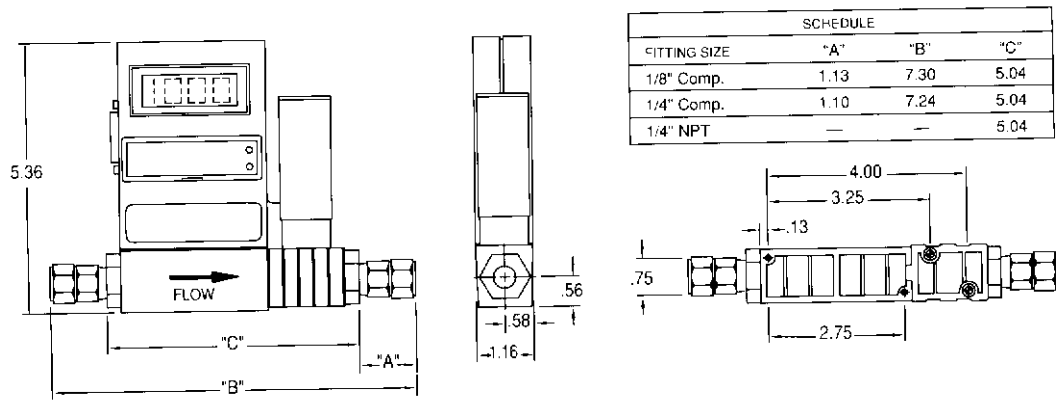
mass flow controllers

4



Description	How It Works
<p>Thermal mass flow controllers like the Series 810C Mass-Trak are more reliable than volumetric flow devices like rotameters because they are relatively immune to changes in gas temperature and pressure. Because these instruments measure molecular flow, they provide the most reliable, repeatable and accurate method of delivering gas to your system.</p> <p>The 810C 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.</p> <p>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.</p>	<p>Gas enters the Mass-Trak and divides into two flow paths. Most of the flow goes through the laminar-flow bypass. This creates a pressure drop that forces a known fraction of the flow through the sensor tube. Two resistance temperature detector coils around the sensor tube direct a constant amount of heat into the gas stream. Heat transfer between these elements results in the interaction with the molecules of the flowing gas, independent of temperature and pressure fluctuations. The sensor signal is amplified, linearized and calibrated to achieve a direct reading of gas mass flow rate.</p> <p>As the gas leaves the sensor and bypass, it flows through the servo-control valve. This valve is similar to an on-off solenoid valve, except that the current to the valve is modulated so that the valve plug assumes the exact height above the valve orifice necessary to maintain the valve's commanded flow. Built-in electronics allow Mass-Trak to maintain continuous proportional control by comparing the measured sensor signal to the command valve flow rate.</p>

Materials	Specifications	
<p><i>Wetted materials are</i></p> <ul style="list-style-type: none"> <li>10% glass-filled nylon 6/6</li> <li>316 stainless steel</li> <li>430F stainless steel</li> <li>nickel plating</li> <li>Viton o-rings</li> </ul>	<p><i>Accuracy</i> +1.5% of full scale</p> <p><i>Repeatability</i> +0.25% of full scale</p> <p><i>Gas and ambient temperature</i> 32 to 120°F</p> <p><i>Gas pressure</i> 20 psig optimum, 150 psig max.</p> <p><i>Leak integrity</i> 1 x 10<sup>-4</sup> ATM cc/sec of helium</p>	<p><i>Control range</i> calibrated for 10 to 100% of full scale</p> <p><i>Output signal</i> linear 0-5 VDC into 2000 ohm minimum load resistance and linear 4-20 mA into 1000 ohm maximum load resistance (500 ohm-watt/15 VDC supply)</p> <p><i>Response time</i> 1 second</p>



Series 810C Dimensional Drawing

Ordering Information	
<b>P/N 810C-DR-W-X-Y-Z</b> (Select X, Y, and Z parameters from table below)	
W = Inlet and outlet connections:	P4FF = 1/4" NPT female T2FF = 1/8" compression fittings (up to 15 slpm) T4FF = 1/4" compression fittings
X = inlet and outlet pressure calibration:	NF = normal pressure (up to 40 psig) MP = 40-150 psig
Y = flow range:	0-10 sccm = 00010 0-20 sccm = 00020 0-50 sccm = 00050 0-100 sccm = 00100 0-500 sccm = 00500 0-1 slpm = 01000 0-2 slpm = 02000 0-5 slpm = 05000 0-10 slpm = 10000 0-20 slpm = 20000 0-30 slpm = 30000 0-40 slpm = 40000 0-50 slpm = 50000
Z = factory set output option:	V = 0-5 VDC A = 4-20 mA

All flows are based on standard conditions of 70°F and 1 ATM unless otherwise specified when ordering.

## Series A820

electronic mass flowmeters

4

### Description

The Series A820 electronic mass flowmeters are compact, self-contained units designed to indicate the flow rate of gases. Unlike variable area meters, flow rates are unaffected by variations in temperature and pressure within specified limits. The mechanical layout of the design includes an LCD readout built into the top of the transducer. This readout module is tiltable over 90 degrees to provide optimum reading comfort. The readout is connected by a standard modular plug, and is readily removable and extended for remote reading installations. Units are available in aluminum or stainless steel.



### Features

- Rigid metal construction.
- Maximum operating pressure – 1000 psig.
- NIST traceable calibration certification.
- Leak integrity 1 X 10<sup>-7</sup> sccm helium.
- 0-5 VDC or 4-20mA signals.
- Built-in tiltable readout display in engineering units.
- Circuit protection.
- Totalizer option available.

### 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

**Temperature coefficient**  
0.15% of full scale/°C

**Pressure coefficient**  
0.01% of full scale/psi

**Maximum pressure drop**  
0.04 to 3.23 psid depending on flow range

**Gas and ambient temperature**  
32 to 122°F

**Output signals**  
Linear 0-5 VDC (1000 ohms min load impedance) or 4-20 mA (0-250 ohms loop resistance)

**Transducer input power**  
12 VDC; 200 mA of maximum

**Time constant**  
800 ms

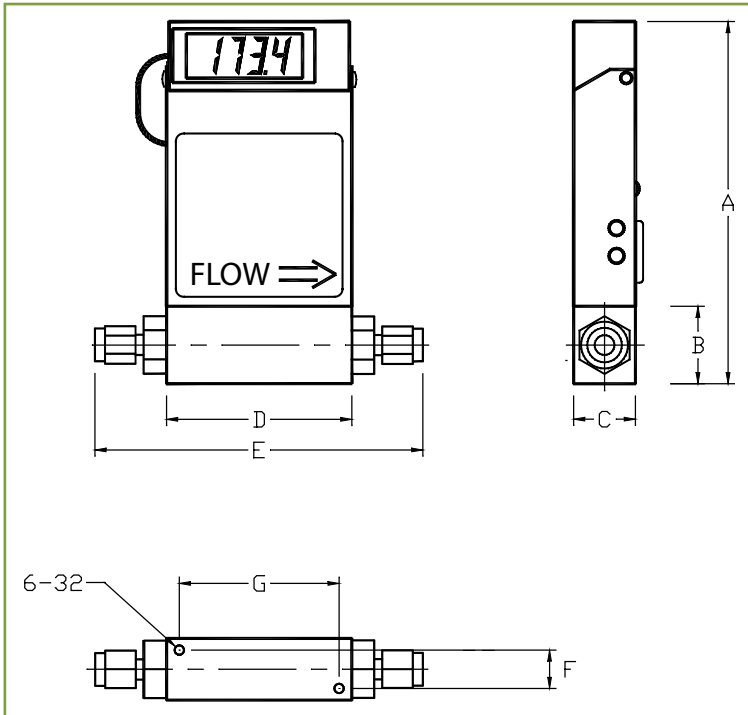
**Materials in fluid contact**  
Aluminum units: anodized aluminum, 316 SS, brass, Viton o-rings  
Stainless steel units: 316 SS and Viton o-rings

**Attitude sensitivity**  
No greater than + 15 degrees from horizontal to vertical:  
Standard calibration is in horizontal position.

**Connections**  
1/4" compression fittings

**Leak integrity**  
1 X 10<sup>-7</sup> sccm of helium maximum to the outside environment

**CE compliant**  
EN 55011 class, class B: EN50082-1  
SGD Catalog 2009:SGD-2903 Catal



Series 820 Dimensional Drawing

**A820 Dimensions**

	Up to 10 slpm	15 to 50 slpm
A	5.60	5.98
B	1.00	1.37
C	1.00	1.25
D	3.00	4.13
E	5.02	6.15
F	0.69	0.69
G	2.69	2.63
H	4.50	4.88

**Ordering Information**

**A820T-W-X-Y-Z**

(Select W, X, Y, and Z parameters from the table below. Also when ordering specify the gas, inlet pressure and operating temperature for the calibration.)

T = Totalizer	(omit T if no totalizer is required)	
W = material:	A = aluminum S = stainless steel	
X = Seals:	V = Viton® B = Buna E = EPR T = Teflon®	
Y = flow range:	0-10 sccm = 00010 0-20 sccm = 00020 0-50 sccm = 00050 0-100 sccm = 00100 0-200 sccm = 00200 0-500 sccm = 00500 0-1 slpm = 01000 0-2 slpm = 02000 0-5 slpm = 05000 0-10 slpm = 10000 0-15 slpm = 15000 0-20 slpm = 20000 0-30 slpm = 30000 0-40 slpm = 40000 0-50 slpm = 50000	
Z = Output signal:	V = 0-5 VDC A = 4-20 mA	

## Series 6200

indicating oxygen trap

4

### Description

This unit is a step above other indicating oxygen traps. The unit comes to you completely assembled and ready for installation. It is ideal for use in-line directly after our Series 6300 oxygen removing trap to determine when to replace the larger unit. Used in this way the 6200 unit will last a considerable time if it is monitored regularly. A centimeter scale on the tube helps you to monitor the condition of the reactants.

The 6200 Series actually removes oxygen rather than convert it to another form of contamination. Oxygen reacts with the activated bed material to form manganese oxide that has a deep brown color providing a dramatic and progressive color change. The presence of moisture does not affect the oxygen removing capacity of the unit.

### Features

- Reduces oxygen to less than 15 ppb.
- Reactive materials are contained in a glass tube protected by a clear plastic outer tube. The reactive materials are only in contact with glass and metal.
- Centimeter scale on reaction tube helps to monitor activity.
- The expended reactant material is non-hazardous, non-toxic, non-flammable, and non-reactive.
- Mounting clip available for convenient installation.
- Oxygen removing capacity: 6200 - 30 mg, 6250 - 150 mg
- Working pressure: 100 psig
- Dimensions: 6200 - 1.125" O.D. x 9.5" long,  
6250 - 1.5" O.D. x 10.25" long



### Ordering Information

Model	Connections
6200-2*	1/8" tubing compression
6200-4*	1/4" tubing compression
6250-2*	1/8" tubing compression
6250-4*	1/4" tubing compression
6200C	mounting clip for 6200
8012C	mounting clip for 6250

\* Available with stainless steel compression fittings - add "SS" to part number.

Gas traps should be mounted in a vertical position to ensure proper contact of the gas with the adsorbent. Use model 6200C mounting clip with 6200 Series hydrocarbon trap.



6200C Mounting Clip

oxygen removing purifier for hydrogen

**Series 6210**

4



### Description

The Series 6210 Purifiers remove oxygen from hydrogen by catalytic action. They are capable of removing up to 1% oxygen from a hydrogen stream down to a level of less than 1 ppm. This reaction is normally accomplished at room temperature. At higher oxygen impurity concentrations, some-what elevated temperatures may be experienced depending on operating conditions.

The purification is carried out by the formation of water from the oxygen impurity and the hydrogen background. If water presents a problem in your system it is suggested that a Model 8010 or 8000 purifier be installed in the system after the Series 6210 unit.

The catalytic materials do not require regeneration and will function indefinitely providing that they are not contaminated. Sulfur and halogens are the primary contaminants of concern.

### Ordering Information

Model	Max. Flow SCFH	Max. Oper. Press. psig	Connections female	Dimensions inches
6210-10	10	2000	1/4" compression	1.05" dia. x 9.5" long
6210-25	25	2200	1/4" compression	1.32" dia. x 14.5" long
6210-50	50	1200	1/4" compression	1.66" dia. x 15" long
6210-100	100	1400	1/4" compression	2.38" dia. x 15.5" long
6210-200	200	1300	1/4" compression	2.88" dia x 19.5" long
6210-500	500	900	1/2" compression	4.0" dia. x 23" long



## Series 6300

oxygen traps

4

### Description

These Series 6300 oxygen traps contain a highly active, metal-containing, inert supported reagent filled into a one-piece aluminum container. The trap is capable of reducing the oxygen content of a gas stream down to 99.99998% of its original concentration. Each unit is filled under a heated flow of ultra high purity helium to eliminate the need for extensive purging prior to GC or GC/MS operation.

The Series 6300 units are ideal for use with hydrogen and inert carrier gases commonly used with TC and FID gas chromatographs as well as argon-methane mixtures used with electron capture gas chromatographs. The all metal housing virtually eliminates contamination and resultant signal noise that often occur with traps constructed of other materials. These units can also be used to treat carbon monoxide, carbon dioxide, alkanes, alkenes, aliphatic hydrocarbon gases and low boiling point aromatics, like benzene and toluene.

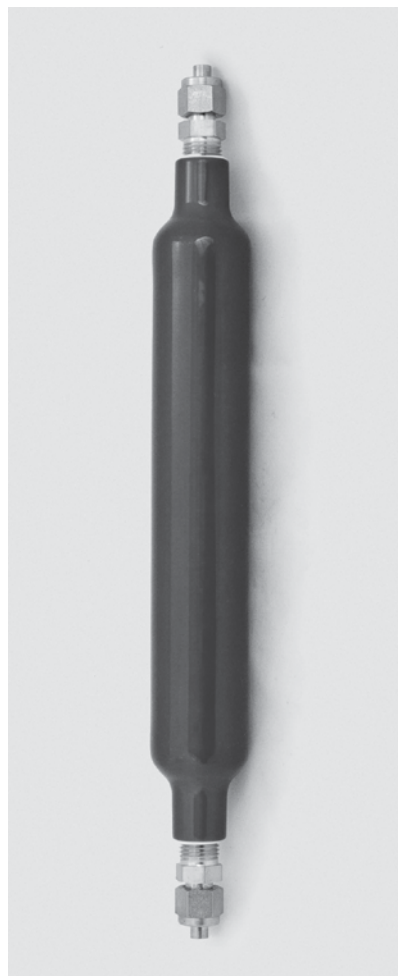
### Features

- Reduces oxygen levels to less than 15ppb.
- Scrubbing agent sphere size optimized to achieve maximum surface area and capacity to provide twice the surface area and capacity of “look-alike” units.
- Filter design and aspect ratio prevents channeling and promotes even flow and efficient scrubbing.
- Inlet and outlet fitted with 40 micron stainless steel frits.
- All metal construction.
- Bed material treated with ultra high purity helium.
- Operating pressure: 250 psig
- Oxygen removal capacity: 6300 525 mg  
6350 4200 mg
- Dimensions: 6300 1.25” O.D. x 11.25” long

### Ordering Information

Model	Connections
6300-2*	1/8” tubing compression
6300-4*	1/4” tubing compression
6350-8*	1/2” tubing compression
8012C	mounting clip
8050C	mounting clip for 6350

\*Available with stainless steel compression fittings - add “SS” to part number.



Gas traps should be mounted in a vertical position to ensure proper contact of the gas with the adsorbent. Use model 8012C mounting clip with 6300 Series oxygen trap.



8012C Mounting Clip

Description					
<p>The 6400 Series carbon dioxide trap is designed to remove CO<sub>2</sub> gas from air, argon, helium, hydrogen, or nitrogen. The trap body is constructed of borosilicate glass with nickel plated end fittings with stainless steel sintered frits.* The absorption media is a formulation of sodium hydroxide and calcium hydroxide with an high absorptive capacity and indicating properties. Typically, this material will absorb 15-20% of its weight in carbon dioxide before the material is saturated and needs to be replaced. Replacement is indicated when the normally white color of the material turns violet. If moisture is detrimental to your system, a moisture trap should be installed down stream from this unit to absorb water evolved from the absorption of the carbon dioxide.</p>					
Features					
<ul style="list-style-type: none"> <li>Removes carbon dioxide to less than 0.5 ppm</li> <li>Inlet and outlet fitted with 40 micron stainless steel frits.</li> <li>Reaction with carbon dioxide indicated by color change from white to violet.</li> <li>Inlet and outlet connections are 1/4" or 1/8" stainless steel compression fittings.</li> </ul>					
<ul style="list-style-type: none"> <li>CO<sub>2</sub> removing capacity:</li> </ul>	<table> <tr> <td>6410</td> <td>45 grams CO<sub>2</sub></td> </tr> <tr> <td>6425</td> <td>90 grams CO<sub>2</sub></td> </tr> </table>	6410	45 grams CO <sub>2</sub>	6425	90 grams CO <sub>2</sub>
6410	45 grams CO <sub>2</sub>				
6425	90 grams CO <sub>2</sub>				
<ul style="list-style-type: none"> <li>Dimensions:</li> </ul>	<table> <tr> <td>6410</td> <td>1.5" O.D. x 12.5" long</td> </tr> <tr> <td>6425</td> <td>1.75" O.D. x 16.5" long</td> </tr> </table>	6410	1.5" O.D. x 12.5" long	6425	1.75" O.D. x 16.5" long
6410	1.5" O.D. x 12.5" long				
6425	1.75" O.D. x 16.5" long				



Gas traps should be mounted in a vertical position to ensure proper contact of the gas with the adsorbent. Use model 6400C or 8040C mounting clip with 6400 Series carbon dioxide trap.

Ordering Information		
Model	Connections	End fittings
6410-2	carbon dioxide trap - 100 cc	1/8" compression
6410-4	carbon dioxide trap - 100 cc	1/4" compression
8012C	mounting clip for 6410 trap	
6425-2	carbon dioxide trap - 250 cc	1/8" compression
6425-4	carbon dioxide trap - 250 cc	1/4" compression
8040C	mounting clip for 6425 trap	



8040C Mounting Clip

## Series 8000

high capacity units

4

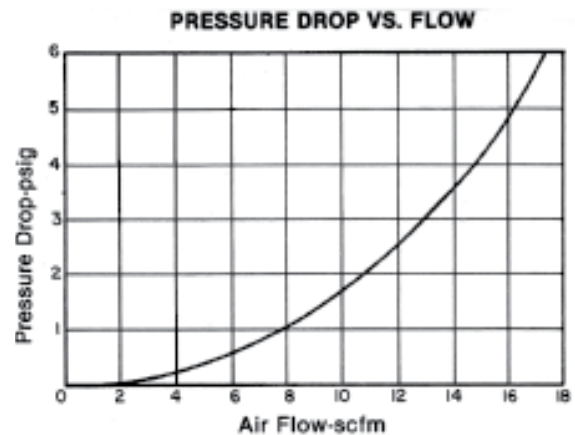
### Description

The model 8000 replaceable cartridge gas purifier is similar to the Model 8010 but is designed for higher capacities and a lower working pressure. The Model 8000 is constructed of a machined aluminum shell that accepts a large capacity cartridge. This shell may be permanently mounted when installed in the gas line and can be serviced without disturbing the line connections. Spring pressure holds the replaceable cartridge tightly against the bottom gasket to prevent the gas to be purified from bypassing the cartridge. The side inlet is located at the bottom of the unit oriented 90° from the outlet located at the top of the unit.

The model 8000 purifier shell must be used in conjunction with specially designed replaceable cartridges (Model 8000-1, 8000-2, or 8000-3 )filled with various adsorbents. These are described below. These cartridges are shipped in hermetically sealed cans with convenient pull-tab ends for easy opening. This improved packaging ensures full retention of capacity in storage until the time of use.



Materials	Specifications
Shell body: anodized aluminum Gaskets: buna-N Cartridges: 8000-1 Molecular Sieve 13x 8000-2 Molecular Sieve 4A 8000-3 Activated Charcoal 8010-5 Molecular Sieve 3A 8010-6 Molecular Sieve 5A	<i>Max. Operating Pressure</i> 1500 psig  <i>Operating Temperature</i> -40° to +200°F  <i>Inlet and Outlet Ports</i> 1/4" NPT female  <i>Dimensions</i> 4 1/2" dia. x 15 9/16" long  <i>Weight with Cartridge</i> 12.6 lbs  <i>Dew Point Achievable</i> -100° F



### Ordering Information

Model	Description	Absorption Capacity	General Application
8000	Purifier Shell Only		
8000-1	Molecular Sieve 13x	126 grams water	Removal of oil and water from inert gases and saturated hydrocarbons
8000-2	Molecular Sieve 4A	134 grams water	Removal of water
8000-3	Activated Charcoal (Warning: Do not use with oxygen concentrations in excess of 21%)		Removal of heavy hydrocarbons acetone level control in acetylene used for atomic absorption
8000-5	Molecular Sieve 3A		Removal of water from unsaturated hydrocarbons such as acetylene
8000-6	Molecular Sieve 5A		

for pressure applications up to 3000 psig

**Series 8010**

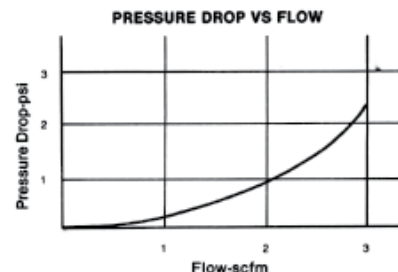
**Description**

The model 8010 replaceable cartridge gas purifier is useful in many laboratory and industrial applications where the introduction of oil and/or water can result in poor performance or equipment shut-down. It is not uncommon to find varying levels of these impurities in some industrial gases and occasionally even in specialty carrier gases. The small daily operating costs are easily justified by the prevention of a system shut-down and the subsequent cleaning and/or repair costs.

The units are especially useful in GC carrier gas lines to ensure that undesirable moisture does not enter the instrument. Water can contribute to inaccurate results and the rapid deterioration of expensive chromatography column separation phases.

The model 8010 purifier shell must be used in conjunction with specially designed replaceable cartridges.

Models 8010-1, 8010-2, or 8010-3 are filled with various adsorbents. Model 8010-4 contains a 5 micron sintered bronze filter element. These are described below. These cartridges are shipped in hermetically sealed cans in a dry nitrogen atmosphere with convenient screw caps for easy opening. This improved packaging ensures full retention of capacity in storage until the time of use.



**Materials**

Shell Body: anodized aluminum  
 Shell Head: nickel plated brass  
 O-ring seal: buna-N  
 Cartridges: 8010-1 Molecular Sieve 13x  
 8010-2 Molecular Sieve 4A  
 8010-3 Activated Charcoal  
 8010-4 Sintered Bronze  
 8010-5 Molecular Sieve 3A  
 8010-6 Molecular Sieve 5A

**Specifications**

*Max. Operating Pressure*  
3000 psig (500 psig for oxygen)

*Operating Temperature*  
-40° to +165°F

*Inlet and Outlet Ports*  
1/4" NPT female

*Dimensions*  
2" dia. x 5 3/4" long

*Weight with Cartridge*  
1.5 lbs

*Dew Point Achievable*  
-100° F

**Ordering Information**

Model	Description	Absorption Capacity	General Application
8010	Purifier Shell Only		
8010-1	Molecular Sieve 13x	6.5 grams water	Removal of oil & water
8010-2	Molecular Sieve 4A	7.2 grams water	Removal of water from inert gases and saturated hydrocarbons
8010-3	Activated Charcoal (Warning: Do not use with oxygen concentrations in excess of 21%)		Removal of heavy hydrocarbons acetone level control in acetylene used for atomic absorption
8010-4	5 micron sintered bronze element (other micron sizes available)		Particulate removal
8010-5	Molecular Sieve 3A		Removal of water from unsaturated hydrocarbons such as acetylene
8010-6	Molecular Sieve 5A		

## Series 8012, 8020, & 8040, 8050

indicating moisture traps

### Description

These units are designed to remove water, oil and organics from gases commonly used as gas chromatography carrier gases. They are constructed from Lexan® polycarbonate tubing with aluminum end caps sealed with Viton® o-rings, except for the 8050 which has a solid aluminum housing and is thus non-indicating. All units are filled with a mixture of molecular sieve 13X and indicating molecular sieve 4A. These are the highest capacity molecular sieves available and the preferred choice for gas drying. The blue indicating sieves turn buff color at 20% relative humidity.

### Features

- Reduces water to less than 20 ppb.
- Available in 3 sizes (120 cc, 200 cc, 400 cc, 1600 cc) that can easily be refilled.
- Inlet and outlet o-ring sealed connectors are equipped with 40 micron sintered stainless steel frits to prevent particulates from entering your system.
- Mixed spherically shaped 13X and 4A absorbents provides superior bed packing with less resistance to flow.
- Mounting clip available for convenient installation.
- Moisture removal capacity:
 

8012	21.6 grams
8020	36.0 grams
8040	72.0 grams
8050	132 grams
- Dimensions:
 

8012-2 or -4	1.5" O.D. x 9.0" long
8020-2 or -4	1.5" O.D. x 12.5" long
8040-2 or -4	1.75" O.D. x 17.5" long
8050-8	2 3/8" O.D. x 17" long
- Working Pressure:
 

8012, 8020, 8040	125 psig
8050	250 psig



8012C Mounting Clip

Gas traps should be mounted in a vertical position to ensure proper contact of the gas with the adsorbent. Use model 8012C, 8040C or 8050C mounting clip with 8012, 8020 and 8040 Series moisture traps.

### Ordering Information

Model	Capacity	Connections
8012-2*	120 cc	1/8" tubing compression fitting
8012-4*	120 cc	1/4" tubing compression fitting
8020-2*	200 cc	1/8" tubing compression fitting
8020-4*	200 cc	1/4" tubing compression fitting
8040-2*	400 cc	1/8" tubing compression fittings
8040-4*	400 cc	1/4" tubing compression fittings
8040R	400 cc	Provides enough for three 120 cc, two 200 cc, or one 400 cc refill
8050-8*+	735 cc	1/2" tubing compression fitting
8050R	1500 cc	provides enough for two refill
8012C		for mounting 8012 and 8020 units
8040C		for mounting 8040 units only
8050C		for mounting 8050 units only

+ 8050 is a non-indicating trap.

\* Available with stainless steel compression fittings - add "SS: to part number.

**Description**

These units are designed to remove organics, such as alcohols, aromatics, chlorinated hydrocarbons, esters, ethers, hydrocarbons, and ketones from air, hydrogen and inert carrier gases used in gas chromatography. They are constructed of aluminum and filled with extremely high surface area coconut shell based activated carbon.

The 8200 is a refillable purifier. Since impregnated carbons do not readily desorb all compounds, we recommend that the units be changed or refilled on a regular schedule using our 8200R refill kit that provides enough material for two charges of an 8200 or the 8250R which provides one charge of an 8250.

**Features**

- Removes organics from air, hydrogen, and inert carrier gases. Does not remove light hydrocarbons like methane.
- Highly active coconut shell based carbon efficiently removes many types of hydrocarbon compounds.
- All metal housing
- Refillable 200 cc or 1600 cc capacity
- 40 micron filters on the inlet and outlet
- Mounting clip available for convenient installation
- Working pressure: 250 psig
- Dimensions: 8200 1.5" O.D. x 12.5" overall length  
8250 2 3/8" O.D. x 17" overall length

**Ordering Information**

Model	Connections
8200-2*	1/8" tubing compression fittings
8200-4*	1/4" tubing compression fittings
8250-8*	1/2" tubing compression fittings
8250R	Refill kit - contains 3 charges
8200R	Refill kit - contains 2 charges
8012C	Mounting clip
8050C	Mounting clip for 8250

\* Available with stainless steel compression fittings - add "SS:" to part number.



8012C Mounting Clip

Gas traps should be mounted in a vertical position to ensure proper contact of the gas with the adsorbent. Use model 8012C mounting clip with 8200 Series hydrocarbon traps.

## Filter Applications

### Gas Chromatography

Particulates in an instrument carrier gas stream can reduce the overall performance of laboratory analytical work. Removing particles can reduce background noise levels and enhance instrument accuracy and precision.

### Pharmaceutical Manufacturing

The capability of these filters to remove bacteria and other particulate matter enables pharmaceutical manufacturers to install a filter in gas lines to those systems requiring process, purge or blanket gases, thus ensuring a virtually sterile gas atmosphere.

### Pneumatic Operated Devices

Because of the small orifices normally associated with these devices, they often malfunction and require frequent servicing. Installation of a particulate filter in the air or nitrogen feed lines helps to ensure longer trouble free operation, thus reducing down-time.

### Semiconductor Manufacturing

With increasing levels of device density the effect of particulate contamination becomes more damaging to potential yields. Semiconductor manufacturers install these filters in virtually all their gas lines to reduce the effects of particulates and improve their production yields.

## Series 5010

Teflon® membrane gas line filter 0.01 microns



Description	Features	Specifications
The Teflon® medium in this filter efficiently traps particles down to 0.01 microns. These units may be installed in gas lines supplied by cylinders or bulk sources. Both the materials and manner of construction render the Series 5010 units compatible with a wide variety of gases.	<ul style="list-style-type: none"> <li>• 100% efficient at 0.01 micron level</li> <li>• Filter medium - porous PTFE Teflon® membrane</li> <li>• All welded 316L stainless steel construction</li> <li>• Internal finish - less than 15 R<sub>a</sub></li> <li>• 0.5 sq. ft. filter area provides high particle retention capacity</li> <li>• Excellent compatibility with a wide variety of gases</li> </ul>	<p><i>Filtration</i> 100% @ 0.01 microns</p> <p><i>Max. Operating Pressure</i> 1000 psig @ 70°F</p> <p><i>Max. Operating Temperature</i> 100°F</p> <p><i>Max. Flow</i> 250 slpm @ 15 psi ΔP</p>

### Ordering Information

Type of End Connection	Model Number	Connection Size		Dimensions	
		Inlet**	Outlet**	Length	Diameter
				Inch	Inch
Standard Pipe	5010-P4FF	1/4" NPT female	1/4" NPT female	3.58	2.0
Tubing Compression	5010-T4FF	1/4" tubing compression	1/4" tubing compression	3.82	2.0
	5010-T8FF	1/2" tubing compression	1/4" tubing compression	5.17	2.0
VCR® Compatible Face Seal	5010-V4MM	1/4" face seal male	1/4" face seal male	3.73	2.0

\*\* Other end fitting configurations available on request.

depth gas filters - 0.01 microns **Series 7010**

4



Description	Features	Specifications
<p>The Series 7010 depth 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.</p> <p>The Series 7010 filters employ a microporous fiberglass media held in a 316 stainless steel all welded housing. They are available in two sizes that accommodate most flow requirements.</p>	<ul style="list-style-type: none"> <li>• 99.9999% filtration efficiency at 0.01 micron level.</li> <li>• All welded 316 stainless steel construction provides compatibility with a variety of gases.</li> <li>• Long service life - particles are collected in the filter matrix throughout the depth of the filter.</li> <li>• Helium leak tested to 1 x 10<sup>-9</sup> cc/sec.</li> </ul>	<p><i>Filtration</i> 99.9999% @ 0.01 microns</p> <p><i>Max. Operating Pressure</i> 250 psig @ 250°F</p> <p><i>Operating Temperature</i> 0° to 750°F.</p>

Ordering Information						
Type of End Connection	Model Number	Connection Size		Dimensions		Max. Flow@ 5 PSI ΔP Inlet SLPM
		Inlet**	Outlet**	Length	Diameter	
				Inch	Inch	
Standard Pipe	7010-P4FF	1/4" NPT female	1/4" NPT female	2.68	2.0	50
Tubing	7010-T4FF	1/4" tubing compression	1/4" tubing compression	3.125	2.0	50
VCR® Compatible Face Seal	7010-V4MM	1/4" face seal male	1/4" face seal male	3.125	2.0	50

\*\* Other end fitting configurations available on request.



## Electronic Cylinder Scales

### Description

The pressure of a liquefied gas remains constant as material is withdrawn as long as a liquid phase remains in the cylinder. When the liquid phase is exhausted the pressure drops very quickly and the cylinder empties without warning. This phenomenon renders a cylinder pressure gauge virtually useless. A similar situation arises when using cryogenic containers of liquid nitrogen, oxygen, and argon. The only way to monitor the contents of a cylinder of liquefied gas or a cryogenic container is by weight.

The Series 620 and 320 electronic scales are designed to give a positive indication of the amount of product remaining in the cylinder as material is being withdrawn. These units allow the user to electronically subtract the tare weight of the cylinder so that only the net contents can be read directly. The built-in alarm can be set for any weight value from 0-100% of the scales capacity. The units provide a red LED visual alarm and an audible alarm with silence function. An integral solid state relay is provided for the activation of external alarms or other equipment when the alarm set point is reached.

The scales are ruggedly constructed using one or more load cells in a sturdy stainless steel and/or aluminum diamond plate platform with mechanical stops at 150% of capacity to prevent damage.

The model 620G-300 with a capacity of 300 pounds has a 9.5" x 9.5" stainless steel platform that accommodates most compressed gas cylinders. For larger diameter cylinders, the 320DL-500 is available with a capacity of 500 pounds has a 36" x 36" diamond plate steel platform. The model 320ML-1000 has a 1000 pound capacity and accommodates cryogenic containers with its 36" x 36" aluminum diamond plate steel platform. A ramp is available for each model so that cylinders can easily be rolled on and off of the scale platform without lifting.



320 Series



620G-300

### Features

- Controller has large 1" high LCD digital display in water resistant housing
- Rugged load cell weighing technology with 300, 500, or 1000 pound capacity
- Weight resolution up to 0.1 pound
- Accuracy 0.1% of full scale
- Built-in visual alarm and audible alarm with silence function
- Built-in solid state relay
- 0-100% of full scale tare weight adjustment
- 0-100% of full scale alarm set point adjustment
- Both large and small platform sizes available
- Easy unit conversion from pounds to kilograms

### Applications

Recommended for use with all liquefied and cryogenic containers in applications where running out of gas will cause a serious disruption in operations or a loss of product.

### Ordering Information

Model	Total Capacity Pounds	Resolution pounds	Platform Dimensions
620G-300	300	0.1	9.25" w x 9.25" d x 1.5" h
320DL-500	500	0.1	20" w x 27" d x 1-7/8" h
320ML-1000	1000	0.2	20" w x 27" d x 1-7/8" h
620R	ramp for 620G		9" w x 5.5" d x 1.5" h
320RL	ramp for 320D & 320M		20" w x 18" d x 1-7/8" h

**cylinder scale for liquefied gases** **Model 900**

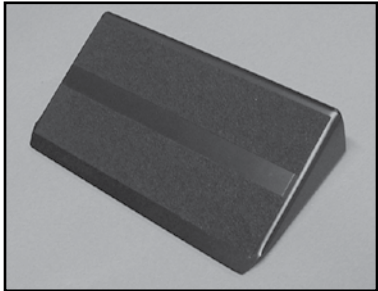
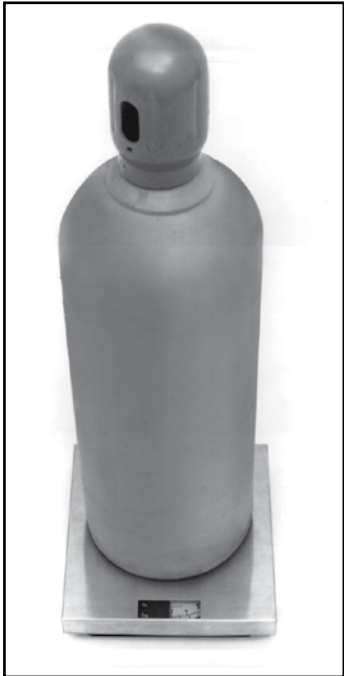
4

**Description**

The pressure of a liquefied gas remains constant as material is withdrawn as long as a liquid phase remains in the cylinder. When the liquid phase is exhausted the pressure drops very quickly and empties without warning. This phenomenon renders a cylinder pressure gauge virtually useless. The only way to monitor the contents of a cylinder containing a liquefied gas is by weight.

The Model 900 cylinder scale is 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. A color coded dial reads in pounds and kilograms. A nonskid ramp is available to make loading cylinders convenient and easy.

The scale is ruggedly constructed and features a stainless steel cover for durability.



900-6 Scale Ramp

Applications	Features	Specifications
Recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane and heavier hydrocarbon gases.	<ul style="list-style-type: none"> <li>• Heavy duty 16 gauge</li> <li>• Stainless steel cover</li> <li>• Dual dial scale - pounds and kilograms</li> <li>• Color-coded easy to read dial</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Tare weight range</i> 0-140 lbs. (0-68 kg.)</li> <li>• <i>Product weight range</i> 0-140 lbs. (0-68 kg.)</li> <li>• <i>Total capacity</i> 280 lbs (136 kg.) in 5 lb. (2 kg.) divisions</li> <li>• <i>Readability</i> 1 lb. (0.5 kg.) by estimation</li> <li>• <i>Dimensions</i> 10 3/4" x 10 1/4" x 2" high</li> </ul>

Ordering Information	
Model	Description
900	Scale with non-skid ramp
900-5	Scale only
900-6	Ramp only

## Series 8491

flash arrestor

4



Description	Features
<p>The new 8491 Series re-settable flashback arrestors offer four (4) safety devices in each unit. Safety features include protection against flashbacks with a wide range of mixtures of oxygen or air with flammable gases including hydrogen, acetylene, methane and LPG gases. The design includes a built-in non-return (check) valve to stop reverse flow and a thermal shut off which stops gas flow in the event of hose or pipe line fire. An easily re-settable pressure control stops gas flow in the event of reverse flow or a flashback that creates 10 psig back pressure. This feature alerts the user that a reverse flow or a flashback of greater than 10psig has occurred. These units are easily re-set by pulling up on the pressure control ring (shown above), no disassembly of the gas line or special tools are needed. The 8491 Series high flow capacity makes them suitable for a broad range of applications. Units are U/L listed and meet ISO 5175, EN 730, BS 6158, and AS 4603 standards.</p>	<ul style="list-style-type: none"> <li>• 100% flashback tested after assembly</li> <li>• U/L listed and meets strict international standards (see table)</li> <li>• Automatically re-sets for flashbacks and revers flow below 10 psig</li> <li>• Alerts user by shutting of gas flow in the event of a reverse flow or flashback exceeding 10 psig back pressure (captures back pressure in the housing, no flame or gas is exhausted to the atmosphere)</li> <li>• Stainless steel flame barrier positively extinguishes flame within the housing</li> <li>• Checks reverse flow and provides positive shut-off of revers flow over 10 psig</li> <li>• Thermal cut-off</li> <li>• Built-in 100 micron stainless steel sintered filter on inlet</li> <li>• High flow capacity (see table)</li> </ul>

Materials	
<p><i>Body</i> Alloy 360 brass</p>	<p><i>Flame barrier</i> stainless steel</p>
<p><i>Internals</i> brass</p>	<p><i>Elastomers</i> Neoprene</p>

Working Pressure (U/L)	
Gas	Pressure PSIG
Acetylene	15.0
Hydrogen/oxygen	50.0
Hydrogen/air	150.0
Methane/LPG	50.0
Oxygen	143.0

Ordering Information			
Model	Gas Service	Connections	
		Inlet	Outlet
8491-F	flammables	1/4" NPT female	1/4" NPT female
8491-O	oxidizers	1/4" NPT female	1/4" NPT female
8491-FL	flammables	9/16-18 LH female	9/16-18 LH male
8491-OR	oxidizers	9/16-18 RH female	9/16-18 RH male

Flow Performance	
Inlet Press. PSIG	Air Flow SCFH
7.3	231.0
14.5	465.0
21.8	725.0
36.3	1041.0
72.5	1933.0

stainless steel flash arrestor **Series 8492**



4

Description	Features
<p>The model 8492 is an ideal choice where stainless steel is desired as the material of construction. It may be used on flammable gases other than those approved by U/L providing the materials of construction are compatible. When installed in a line containing a flammable gas these units will prevent reverse flow, stop, and extinguish a flashback. The unit shuts off the flow of gas in the event of a flashback or reverse flow in excess of 7 psig. Re-setting is automatic when the downstream pressure is relieved. There is no need to open the gas line and no disassembly or special tools are required.</p>	<ul style="list-style-type: none"> <li>• U/L listed 23Y5 for: Acetylene @15.0 psig Hydrogen/air @ 50.0 psig LPG @50.0 psig Oxygen @143.0 psig.</li> <li>• May be used on compatible corrosive flammable gases.</li> <li>• Reusable – can be reused after a flashback without opening the system or removing from service.</li> <li>• Stainless steel flame barrier positively extinguishes flame within the housing.</li> <li>• Checks reverse flow and provides positive shut-off of reverse flow over 7 psig.</li> <li>• Thermal cut-off.</li> <li>• Built-in 100 micron</li> </ul>

Materials	Flashback Approvals
<p><i>Body</i> 316L stainless steel</p> <p><i>Internals</i> stainless steel</p> <p><i>Flame barrier</i> stainless steel</p> <p><i>Elastomers</i> Neoprene</p>	<p>U/L listed 23Y5 ISO 5175. BS 6158 EN 730 (BAM/DIN) AS 4603</p>

Working Pressure (U/L 23Y5)	
Gas	Pressure PSIG
Acetylene	15.0
Hydrogen/air	50.0
Methane/LPG	50.0
Oxygen	143.0

Ordering Information			
Model	Gas Service	Connections	
		Inlet	Outlet
8492-P4FM-F	flammables	1/4" NPT female	1/4" NPT male
8492-P4FM-O	oxidizers	1/4" NPT female	1/4" NPT male

Flow Performance	
Inlet Press. PSIG	Air Flow SCFH
7.3	231.0
14.5	465.0
21.8	725.0
36.3	1041.0
72.5	1933.0

## Series 8100

miniature forged needle valves

### Description

These valves are used in a wide variety of industrial and laboratory applications. They offer excellent flow control and both the brass and stainless steel models have Teflon® packing

### Specifications

*Max. Operating Pressure*  
3000 psig

*Operating Temperature range*  
-65° to 165°F

*Flow coefficient (C<sub>v</sub>)*  
0.35



### Ordering Information

Brass	Model 316 SS	Monel	Pattern	Connections
8111	8121	—	Straight	1/8" NPT male
8112	8122	8152	Straight	1/4" NPT male
8112A	—	8122A	Angle	1/4" NPT female
8113	8123	—	Straight	1/4" compression

## Series 8400

check valves

### Description

Check valves prevent the return flow of gas, thus keeping foreign substances out of lines, regulators and cylinders located upstream of the valve.

These valves are a spring loaded design with the spring on the high pressure side to protect it from foreign substances. The positive stop prevents over-stressing of the spring by sudden surges of gas pressure. An o-ring at the valve seat provides quick, efficient sealing.

The valves have a one piece body with 1/4" NPT female connections inlet and outlet. It is rated for 3000 psig with a cracking pressure of approximately 1 psig.



### Ordering Information

Model	Material of Construction	Cracking Pressure PSIG	End Connections	Operating Pressure PSIG
8410V	Brass body, Viton® o-ring, stainless steel spring	~ 1	1/4" NPT female	3000
8410V-5-P4MM	Brass body, Viton® o-ring, st. st. spring	~ 5	1/4" NPT male	3000
8420E	316 stainless steel, EPR o-ring, stainless steel spring	~ 1	1/4" NPT female	3000
8420V	316 stainless steel, Viton® o-ring, stainless steel spring	~ 1	1/4" NPT female	3000
8420V-5-P4MM	316 st. st., Viton® o-ring, st. st. spring	~ 5	1/4" NPT male	6000
8450V	Monel®, Viton® o-ring, stainless steel spring	~ 1	1/4" NPT female	3000

Note: Check valves with other o-ring materials are available.

high purity diaphragm packless valves

**Series 8300**



4

Description	Advanced Features	Typical Applications
<p>The multiple metal diaphragm design and Kel-F® seat are the key elements to the high purity success of these valves. They are available in a variety of styles and fitting configurations to meet virtually any application.</p> <p>The 90° lever operated option provides the inherent benefits of a diaphragm packless valve with the quick open/close action and easily identifiable operational status of a lever actuated valve.</p>	<ul style="list-style-type: none"> <li>• Metal diaphragm packless construction for diffusion resistant operation</li> <li>• Capable of passing a helium leak-rate test to 10<sup>-10</sup> cc/sec</li> <li>• Available in multiple turn and 90° lever operated designs.</li> </ul>	<p>The Series 8300 valves are recommended whenever the diffusion of atmospheric gases and moisture into a gas system is undesirable. They are a must in all ultrahigh purity gas transfer systems, particularly those used for gas chromatography carrier gases, samples and calibration standards.</p>

Materials				Specifications
<b>Series 8310</b>		<b>Series 8320</b>		<p><i>Operating pressure</i> brass - 3000 psig stainless steel - 3000 psig</p> <p><i>Operating temperature range</i> 40° to 140°F</p> <p><i>Flow coefficient (Cv)</i> 0.13</p>
<i>Body</i> Brass	<i>Diaphragm</i> Stainless Steel	<i>Body</i> 316 Stainless steel	<i>Diaphragm</i> Stainless steel	
<i>Seat</i> Kel-F®		<i>Seat</i> Kel-F®		

Ordering Information			
Model*	Actuation	Inlet	Outlet
8310-P4FF	Multi-turn	1/4" NPT female	1/4" NPT female
8310L-P4MF	Multi-turn	1/4" NPT male long	1/4" NPT female
8310-P4MM	Multi-turn	1/4" NPT male	1/4" NPT male
8310-T4FF	Multi-turn	1/4" compression	1/4" compression
8311-P4FF	90° lever	1/4" NPT female	1/4" NPT female
8311L-P4MF	90° lever	1/4" NPT male long	1/4" NPT female
8311-P4MM	90° lever	1/4" NPT male	1/4" NPT male
8311-T4FF	90° lever	1/4" compression	1/4" compression
8320-P4FF	Multi-turn	1/4" NPT female	1/4" NPT female
8320L-P4MF	Multi-turn	1/4" NPT male long	1/4" NPT female
8320-P4MM	Multi-turn	1/4" NPT male	1/4" NPT male
8320-T4FF	Multi-turn	1/4" compression	1/4" compression
8321-P4FF	90° lever	1/4" NPT female	1/4" NPT female
8321L-P4MF	90° lever	1/4" NPT male long	1/4" NPT female
8321-P4MM	90° lever	1/4" NPT male	1/4" NPT male

\* Other end connection configurations available upon request.

## 502 Series

straight purges

### Description

The 502 Series purges are designed for use with high purity gases to ensure system integrity during breakdown of components or during gas source changes. Purges provide safety by preventing the release of toxic or corrosive gases into the workplace when changing cylinders, corrosion resistance by preventing corrosive or halogen gases from coming into contact with atmospheric moisture, and purity by preventing air from infiltrating high purity systems at the time of cylinder change.

### Materials and Specifications

Seat	PCTFE
Diaphragm	Elgiloy®
Seals	Metal-to-Metal
Check Valve Seat	Viton®
Cv	0.17
Maximum Pressure	3000 PSIG (210 BAR)



### Ordering Information

Order No.	Body Material	Purge Type	Weight
502 1002	Brass	Straight purge	1.2 lbs. (0.54 kg)
502 1005	316L stainless steel	Straight purge	1.2 lbs. (0.54 kg)

## 533 Series

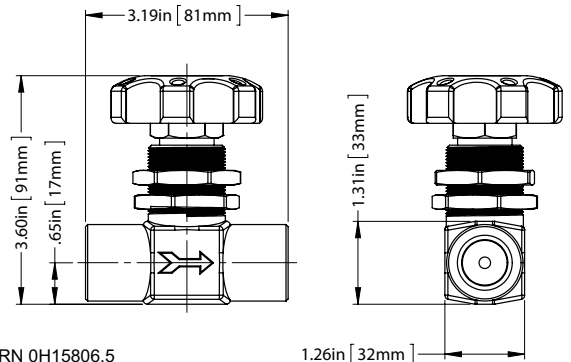
high flow diaphragm valves

### Description

The 533 Series high flow diaphragm valves are ideal for primary or pipe line control in high purity or corrosive gas services. The forged 316L stainless steel body and metal-to-metal diaphragm seal ensure leak tight integrity at higher pressures. The ergonomic round knob, special diaphragm material and spring design ensure easy operation at high pressure and a high cycle life over a broad temperature range. With a positive seat shutoff, panel mount as standard and a directional flow arrow signifying recommended primary flow, the 533 Series is ideal for integrating into high flow systems.

### Materials and Specifications

Maximum Inlet Pressure	3500 PSIG (240 BAR) @70oF
Maximum Differential Back Pressure	3000 PSIG (210 BAR)
Temperature Range	-65oF to 150oF (-54oC to 65oC)
Helium Leak Integrity	2x10 <sup>-8</sup> scc/sec
Body	Forged 316L stainless steel
Diaphragms	Elgiloy®
Seats	PCTFE
Seals	Metal-to-metal
Cv	0.30
Panel Mount Hole	1.25" (31.75 mm)



CRN 0H15806.5

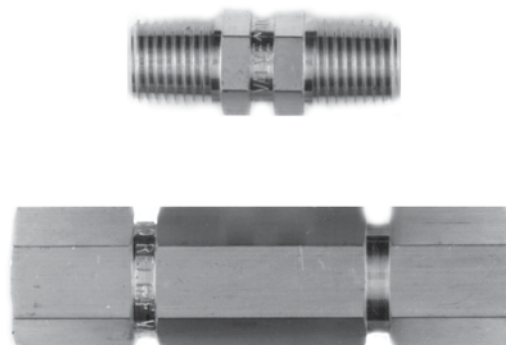
### Ordering Information

Order No.	Inlet Connection	Outlet Connection	Body
533 8002	1/2" MPT	1/2" FPT	316L stainless steel
533 8008	1/2" MPT	1/2" FPT	316L stainless steel

pressure relief valves

**Series 8600**

4



Description	Features	Specifications
These easily field adjustable relief valves provide for the protection of equipment components installed in systems where they may be exposed to over pressurization due to the failure of another component or an operator error.	<ul style="list-style-type: none"> <li>• Working pressure to 3000 psig</li> <li>• Wide range of pressure adjustment</li> <li>• 100% tested for crack and reseal performance</li> <li>• Available in brass and stainless steel</li> </ul>	<p><i>Maximum Working Pressure @ 70°F</i> 3000 psig</p> <p><i>Flow Coefficient (Cv)</i> 0.35</p> <p><i>Temperature Rating</i> with Buna-N o-ring -10 to 250°F with Viton® o-ring -10 to 375°F</p> <p><i>O-ring Material</i> brass Buna-N stainless steel Viton®</p>

Ordering Information			
Model	Material	Adjustable Range	Connections inlet x outlet
8614-3-P4MM	brass	3-20 psig	1/4" NPT male x 1/4" NPT male
8614-20-P4MM	brass	20-65 psig	1/4" NPT male x 1/4" NPT male
8614-65-P4MM	brass	65-175 psig	1/4" NPT male x 1/4" NPT male
8614-175-P4MM	brass	175-350 psig	1/4" NPT male x 1/4" NPT male
8614-350-P4MM	brass	350-600 psig	1/4" NPT male x 1/4" NPT male
8614-3-P4MM	brass	3-20 psig	1/4" NPT male x 1/4" NPT male
8614-20-P4MM	brass	20-65 psig	1/4" NPT male x 1/4" NPT male
8614-65-P4MM	brass	65-175 psig	1/4" NPT male x 1/4" NPT male
8614-175-P4MM	brass	175-350 psig	1/4" NPT male x 1/4" NPT male
8614-350-P4MM	brass	350-600 psig	1/4" NPT male x 1/4" NPT male
8614-3-P4FF	brass	3-20 psig	1/4" NPT female x 1/4" NPT female
8614-20-P4FF	brass	20-65 psig	1/4" NPT female x 1/4" NPT female
8614-65-P4FF	brass	65-175 psig	1/4" NPT female x 1/4" NPT female
8614-175-P4FF	brass	175-350 psig	1/4" NPT female x 1/4" NPT female
8614-350-P4FF	brass	350-600 psig	1/4" NPT female x 1/4" NPT female
8624-3-P4MM	stainless	3-20 psig	1/4" NPT male x 1/4" NPT male
8624-20-P4MM	stainless	20-65 psig	1/4" NPT male x 1/4" NPT male
8624-65-P4MM	stainless	65-175 psig	1/4" NPT male x 1/4" NPT male
8624-175-P4MM	stainless	175-350 psig	1/4" NPT male x 1/4" NPT male
8624-350-P4MM	stainless	350-600 psig	1/4" NPT male x 1/4" NPT male
8624-3-P4FF	stainless	3-20 psig	1/4" NPT female x 1/4" NPT female
8624-20-P4FF	stainless	20-65 psig	1/4" NPT female x 1/4" NPT female
8624-65-P4FF	stainless	65-175 psig	1/4" NPT female x 1/4" NPT female
8624-175-P4FF	stainless	175-350 psig	1/4" NPT female x 1/4" NPT female
8624-350-P4FF	stainless	350-600 psig	1/4" NPT female x 1/4" NPT female



## Series 8500

manual control valves

### Description

Manual controls are designed for direct connection to a compressed gas cylinder valve outlet. They provide a simple means of transferring the contents of a cylinder to another system or vessel. They **DO NOT** control pressure and should never be used without an operator in attendance at all times.

Four models are presented here with the following basic design features:

- Maximum inlet pressure - 3000 psig
- Teflon® packing for smooth leak-free operation
- Finger-tip control of flow from only a few cc per minute to very rapid withdrawal



### Ordering Information

Series 8520 - 303 Stainless steel		Series 8523 - 303 Stainless Steel with 0-3000 psig Cylinder pressure Gauge		Series 8550 - Monel®	
Model	Outlet Connection	Model	Outlet Connection	Model	Outlet Connection
8520H*	1/4" hose barb	8523H*	1/4" hose barb	8550H*	1/4" hose barb
8520T*	1/4" compression fitting	8523T*	1/4" compression fitting	8550T*	1/4" compression fitting
8520PF*	1/4" NPT female	8523PF*	1/4" NPT female	8550PF*	1/4" NPT female

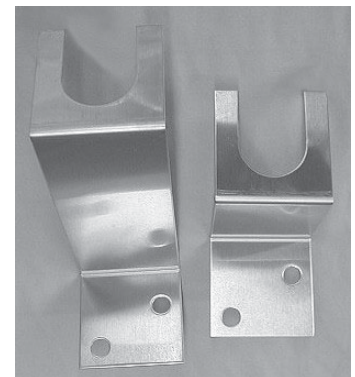
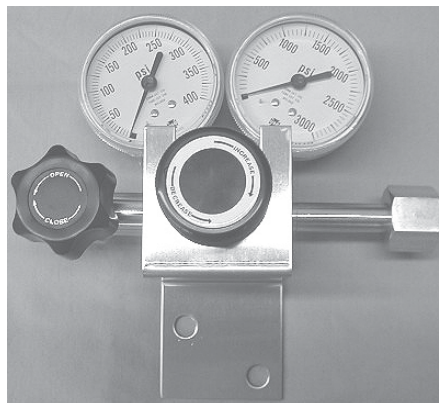
\*Specify CGA connection number when ordering

## Series EZ3000

Easy-Mount regulator bracket

### Description

This bracket allows either single stage or two stage regulators to be mounted or removed without removing the adjusting knob or resetting the delivery pressure provided the regulator is supplied by the factory with the panel mount nut installed.



### Ordering Information

Model	Description
EZ3100	For single stage regulators
EZ3200	For two stage regulators

emergency shut off valves

**586 Series**

4

**Description**

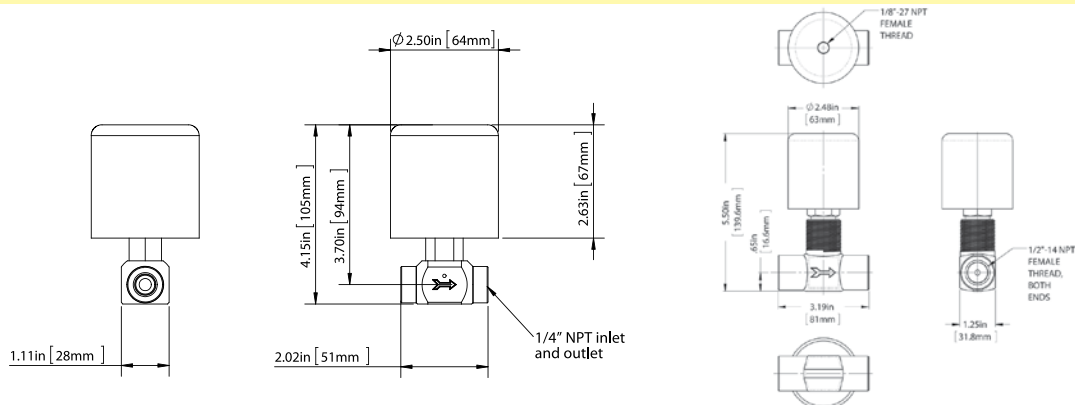
The 586 Series Emergency Shut Off Valve kits are ideal for use as safety devices in high purity, flammable, toxic, or corrosive gas systems where fail-safe shutdown of gas supply and flow is required. The pneumatically-actuated packless diaphragm valves feature long life Egiloy® diaphragms, metal to metal seals, and nickel-plated aluminum actuators. Designed for out of the box control by the CONCOA 585 Emergency Shut Off Controller, these normally closed valves can be integrated into any CONCOA gas delivery system to provide instantaneous shut off. The single valve kit comes with one valve, hose barb connections, and tubing to support a single gas source such as a regulator. The dual valve kit is supplied with two valves, hose barbs, hose barb tee, and tubing to control both headers on a switchover from a single pneumatic source.

**Materials and Specifications**



Maximum Inlet Pressure	3500 PSIG (240 BAR)
Temperature Range	-40°F to 140°F (-40°C to 60°C)
Helium Leak Integrity	1 x 10 <sup>-9</sup> scc/sec
Maximum Seat Leakage	2 x 10 <sup>-8</sup> scc/sec helium
Bodies and Fittings	316L stainless steel
Actuator Housing	Nickel-plated aluminum
Cv	0.17 or 0.30 (high flow)
Actuation Pressure	70 to 125 PSIG (5 to 8 BAR) air to open

**Installation Dimensions**



**Ordering Information**

Order No.	Description
586 1001	Single valve kit (1/4" FPT process ports)
586 1002	Dual valve kit (1/4" FPT process ports)
586 2001	High flow single valve kit (1/2" FPT process ports)
586 2002	High flow dual valve kit (1/2" FPT process ports)

## Model 3-033-R002

SF6 leak detector

4

### Description

The remarkable sensitivity of this hand held unit allows the user to detect sulfur hexafluoride to levels equivalent to 0.1 oz/year (3 grams/year). An advanced microprocessor is the heart of this unit. Its digital signal processing provides excellent management of the circuitry and sensing tip signal. The microprocessor monitors the sensing tip and battery voltage levels 4000 times per second, compensating for even the most minor fluctuations in signal. This translates into a stable and dependable tool in almost any environment.

Convenience features have been incorporated into the 3-033-R002 to enhance its operation. Seven levels of sensitivity provide and increase of 64 times from level 1 to level 7. Unique tri-color LEDs show a progressive and wide range of leak size indication, communicate the sensitivity level, and provide a true voltage indication of battery power level. A tactile keypad controls all functions. The housing design provides the user with a secure grip and control and places the visual indicators in direct sight during use.

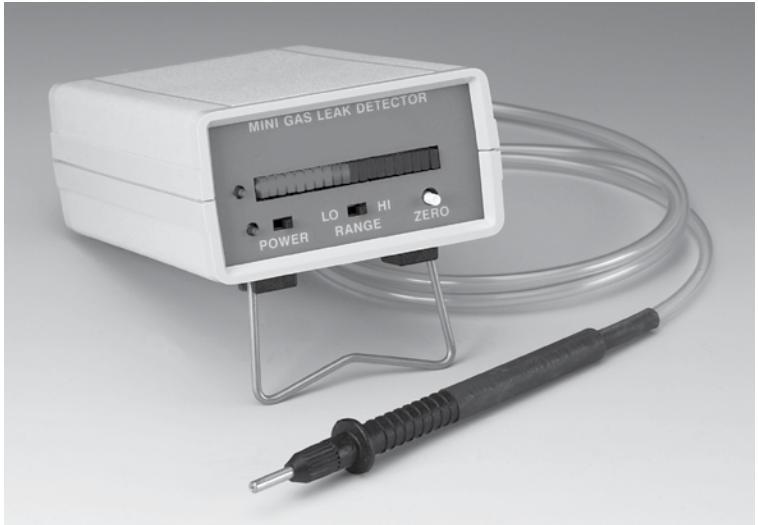


Features	Specifications
<ul style="list-style-type: none"> <li>• Microprocessor control with advanced signal processing.</li> <li>• Seven sensitivity levels.</li> <li>• Tactile keypad controls.</li> <li>• Real-time SF6 sensitivity adjustment.</li> <li>• Battery test function with battery voltage indication.</li> <li>• True mechanical pumping ensures positive air flow through the sensing tip.</li> <li>• Cordless and portable.</li> <li>• 14" flexible stainless steel probe.</li> <li>• Built-in mute feature.</li> </ul>	<p><i>Power Supply</i> 3V DC - two "C" cell alkaline batteries.</p> <p><i>Max Sensitivity</i> 0.1 oz/year (3 grams/year) SF6</p> <p><i>Operating Temperature</i> 30° to 125° F.</p> <p><i>Life</i> Approximately 30 hours normal use</p> <p><i>Response Time</i> Instantaneous</p> <p><i>Reset Time</i> one second</p> <p><i>Warm-up Time</i> Approximately 2 seconds</p> <p><i>Unit Weight</i> 1.2 pounds</p> <p><i>Dimensions</i> 9" x 2.5" x 2.5"</p>

mini gas leak detector **Model 21-070**

4

Description
<p>The model 21-070 gas leak detector easily and quickly pinpoints gas leaks emitting from pressurized systems. Using a thermal conductivity detector with signal amplification, the instrument is zeroed in ambient air and responds to any gas mixture with a thermal conductivity different from that of air. The instrument is highly sensitive, having an intrinsically high signal to noise ratio with amplification that provides a maximum usable sensitivity.*</p> <p>The model 21-070 can be operated with little or no training. Turn it on, zero, probe for leaks: its that simple. As the instrument probe passes over the leak, a sample is drawn into the conductivity cell. When a leak is discovered a signal is registered on the LED bar graph. No messy soap solution, so system contamination</p>



Specifications	*Sensitivity
<p><i>Detector</i> thermal conductivity w/thermistors</p> <p><i>Readout</i> LED bar graph with yellow and red segments</p> <p><i>Line Voltage</i> 115 V, 60 Hz</p> <p><i>Battery</i> Rechargeable NiCCd, 7.2 V/800 mAh</p> <p><i>Battery Life</i> 3.5 hours; may be recharged to 95% in 1 hour</p> <p><i>Dimensions</i> 3.25" W x 1.75" H x 5.25" L</p> <p><i>Weight</i> Instrument 1.05 lbs Charger 0.61 lbs</p>	<p>Helium 1.0 x 10<sup>-5</sup> cc/sec Argon 1.0 x 10<sup>-4</sup> cc/sec COO2 1.0 x 10<sup>-4</sup> cc/sec Refrigerant 1.0 x 10<sup>-4</sup> cc/sec</p>

Ordering Information	
Model	Description
21-070	mini gas leak detector
59-050	carrying case

**CAUTION**

This leak detector is NOT designed to be used to determine leaks of combustible gases. It is designed to determine low level leaks of any gas having a different thermal conductivity than air. Utilizing this property it is, therefore, not specific to any gas or vapor. A combustible gas leak detector should be used for determination of combustible gas leaks in possible hazardous conditions.

## Gas Detection Systems

fixed installation type – Beacon 110, Beacon 200, Beacon 410, and Beacon 800

### Description

Gas detection should not be complicated. The Beacon™ Series is gas detection simplified. The Beacon™ Series are powerful, low cost fixed system controllers for one, two, or up to eight points of gas detection. They are microprocessor controlled, versatile, simple to install and operate, and priced to be the industry's best value single and multiple gas detection controllers.

The wide variety of sensor heads available for the Beacon Series can provide protection for many of the gases commonly used in industry or laboratories today. A comprehensive list of available detectors is provided below.

Sensors can be mounted directly at the Beacon™ housing, or can be wired remote from the controller. The digital displays have backlighting and simultaneous readout of the gas type(s) and concentration(s). The bottom mounted wiring hubs make wiring easy. An external reset switch allows alarms to be silenced from outside the controller housing.

With 10 or 12 amp rated relays, the Beacon Series can be wired directly to a variety of devices like horns, buzzers, or lights eliminating the need for costly external relays from the controller to devices.

The Beacon™ Series is housed in a NEMA 4X rated case for a weather tight seal. This case design complies with the new lock out / tag out standard and can be fully secured. An external reset switch allows the alarm to be silenced from outside of the controller housing. The Beacon™ units ship complete with a wall mounting kit for easy installation.



### Features

- Low cost versatile solution!!
- Compact, weatherproof, NEMA 4X enclosure.
- 115 VAC or 12 VDC operation.
- Long life sensors (2+ years typical).
- Accepts LEL/O<sub>2</sub> /H<sub>2</sub> S/CO direct wire sensors (Beacon 110, 200, and 410).
- Accepts any 4-20 mA transmitter.
- Audible alarm with reset button.
- Three programmable alarm levels.
- Built-in trouble alarm with relay.
- Relay rating 10 or 12 amps, form C.
- Provides 4-20 mA output.

Industry Applications	About Sensors	Direct Wire Detectors
<ul style="list-style-type: none"> <li>• Laboratories</li> <li>• Semiconductor manufacturing facilities</li> <li>• Petrochemical plants &amp; refineries</li> <li>• Water &amp; wastewater treatment plants</li> <li>• Pulp &amp; paper mills</li> <li>• Gas, telephone, &amp; electric utilities</li> <li>• Parking garages</li> <li>• Manufacturing facilities</li> </ul>	<p>The sensor is the actual device that is sensing the gas. Three sensor types are available for use with the Beacon Series Controller: direct wire, gas diffusion, and sample draw. Sensors typically last 2 to 4 years, but can last for a longer or shorter time depending on the nature of the application.</p>	<p>Direct wire detectors are hard wired diffusion sensors to the controller and do not require a transmitter. They are, therefore, more economical than detectors requiring a transmitter. Direct wire detectors can only be used with the Beacon 110, 200, and 410 controllers. While the choice of gases is limited for hard wire detectors they can be an economical choice when available. In general, the use of a transmitter is preferred for distances over 300' to 500' to simplify calibration.</p>

fixed installation type – Beacon 110, Beacon 200, Beacon 410, and Beacon 800

## Gas Detection Systems

4

Ordering Information	
When ordering a Beacon system please specify the following components:	
1. Controller part number	
2. Detector assemblies required	
Model	Description
72-2110 RK	Beacon 100 single point controller
72-2102 RK	Beacon 200 two point controller
72-2104RK	Beacon 410 four point controller
72-2108 RK	Beacon 800 eight point controller



Diffusion Detectors	Sample Draw Detectors
Diffusion detectors rely on the natural flow of air to bring the sample to the detection head. These are an excellent choice for gas cabinets or other forced flow environments where the detector is situated in a constant air flow from the potential gas release to the detector. All diffusion type detectors used with the Beacon Series have transmitters.	Sample draw detectors have an integral pump, which draws the surrounding air to the detector. They are the preferred choice when used in larger areas where there is no specific point at which one can expect a gas leak. All sample draw detectors used with the Beacon Series have transmitters.
Transmitters	
Most sensors require a transmitter to amplify the sensor signal, and to convert the gas sensor signals into a standardized output, such as 4-20 mA, for transmitting the signal to a controller. The transmitter is usually in close proximity to the sensor, and zero and span adjustments must be done at the transmitter. Note that some sensors and controllers do not require the use of a transmitter for LEL or Oxygen detection (Beacon 110, 200, and Beacon 410), and also one is not needed for short distance wiring of H2S or CO sensors for the Beacon 110, 200, and Beacon 410. All transmitters used with the Beacon Series are operated from 24 VDC, and utilize either 2 or 3 wires. In general, even if a sensor can be used with out a transmitter, the use of a transmitter is often preferred for distances over 300' to 500' to simplify calibration.	



## Physical

<b>Enclosure</b>	Wall mounting gray polycarbonate with hinged cover		
<b>Dimensions</b>	<i>Beacon 110</i>	<i>Beacon 200</i>	<i>Beacon 800</i>
	Height: 8.5"	Height: 8.5"	Height: 12.5"
	Width 7.0"	Width: 7.0"	Width: 11.0"
	Depth 4.3"	Depth: 4.3"	Depth: 6.4"
<b>Conduit Connection</b> ½" NPT conduit hubs:	2	3	4
<b>Wiring Termination:</b>	Screw type terminal block 14 gauge max.		
<b>Environmental Operating Temp:</b>	-4°F to 122°F (-20°C to 50°C)		
<b>Storage Temp:</b>	-4°F to 158°F (-20°C to 70°C)		
<b>Relative Humidity:</b>	0 - 95% RH		
<b>Enclosure Rating:</b>	NEMA-4X enclosure, chemical, and weather resistant.		

## Inputs

*Direct Wired Sensors (Beacon 110, 200, and 410 only) Note: Beacon 800 requires 4-20mA sensors.*

*LEL / PPM Hydrocarbon*

*Oxygen*

*Carbon Monoxide*

*Hydrogen Sulfide*

*Remote amp not required for less than 500 feet.*

**4-20 mA Sensors:** Accepts any 4-20 mA transmitter (24VDC, 2 or 3 wire). A wide variety of sensors are available with 4-20 mA signals. (See list of detectable gases. Wiring distances up to 5000 feet.)

## Outputs

### Relays:

<b>Beacon 110:</b>	4 relays - 12 amp rating (at 115 VAC), SPDT isolated contacts. 3 relays for gas alarm levels 1 relay for malfunction
<b>Beacon 200:</b>	2 relays per channel – 10 amp rating (@115 VAC), SPDT isolated contacts. 1 set of common relays: 2 for gas alarm levels, 1 for malfunction
<b>Beacon 410:</b>	2 relays per channel – 10 amp rating (@115 VAC), SPDT isolated contacts. 1 set of common relays: 2 for gas alarm levels, 1 for malfunction
<b>Beacon 800:</b>	2 relays per channel - 10 amp rating (@115 VAC), SPDT isolated contacts. 1 set of common relays: 2 for gas alarm levels, 1 for malfunction

Relays fully programmable for: increasing or decreasing alarm, latching or self reset, normally energized or normally de-energized, time delay for alarm on and alarm off.

**4-20 mA** Signal output, 4-20 mA (into 500 ohms impedance maximum).

**24 VDC** 24 VDC output provided to operate sample drawing adapters or other accessories.

**Display:** Alphanumeric display with back-lighting.  
 Beacon 110: 1 display, 16 characters per line; 2 lines.  
 Beacon 200: 1 display, 20 characters per line; 4 lines  
 Beacon 410: 1 display, 20 characters per line; 4 lines  
 Beacon 800: 2 displays, 16 characters per line; 4 lines each. All 8 channels continuously displayed.

**Audible:** Built-in audible alarm, 94 dB, mounted on enclosure. Coded Output: pulsing = gas alarm steady = fail

**Visual:** Beacon 110: 5 visual alarm LED's on the front cover for status indication, pilot, and malfunction.  
 Beacon 200: 4 visual alarm LED's on the front cover for status indication, pilot, and malfunction.  
 Beacon 410: 4 visual alarm LED's on the front cover for status indication, pilot, and malfunction.  
 Beacon 800: 4 visual LED alarms on front cover for alarm indications, pilot, and malfunction.

## Power

*115 VAC or 12 VDC standard*

*Optional: 230 VAC*

Battery backup option available

## Warranty

*Two years materials and workmanship.*

Measurable Gases	Standard Range	Diffusion Detector Assembly	Sample Draw Detector Assembly	Sensors For			
				110	200	410	800
Ammonia NH3	0 - 75 ppm	GD-K8A-NH3	GD-K7D2 NH3	X	X	X	X
Arsine AsH3	0 - 0.2 ppm	-	GD-K7D2ASH3	X	X	X	X
Boron Trichloride BCl3	0 - 15 ppm	GD-K8A-BCL3	GD-K7D2 BCL3	X	X	X	X
Boron Trifluoride BF3	0 - 9 ppm	-	GD-K7D2 BF3	X	X	X	X
Carbon Dioxide CO2	0-5000 ppm	61-1007RK-02	----	X	X	X	-
Carbon Dioxide CO2	0-5000 ppm	65-2397RK-02	----	X	X	X	X
Carbon Monoxide (XP) CO	0 - 300 ppm	65-2432RK		X	X	X	X
Carbon Tetrachloride CCl4	0 - 30 ppm	-	GD-K8DT-CCL4	X	X	X	X
Chlorine Cl2	0 - 3 ppm	GD-K8A-CL2	GD-K7D2 Cl2	X	X	X	X
Chlorine Trifluoride ClF3	0 - 1 ppm	-	GD-K7D2 ClF3	X	X	X	X
Combustibles (XP) LEL	0 - 100%	61-1000RK		X	X	X	-
Combustibles (4-20mA) (XP) LEL	0 - 100%	65-2400RK	-	X	X	X	X
Diborane B2H6	0 - 0.3 ppm	GD-K8A-B2H6	GD-K7D2 B2H6	X	X	X	X
Dichlorosilane DCS	0 - 15 ppm	GD-K8A-DCS	GD-K7D2 DCS	X	X	X	X
Disilane Si2H6	0 - 15 ppm	GD-K8A-SI2H6	GD-K7D2 Si2H6	X	X	X	X
Fluorine F2	0 - 3 ppm	-	GD-K7D2 F2	X	X	X	X
Germane GeH4	0 - 2 ppm	-	GD-K35PN-GEH4	X	X	X	X
Hydrazine N2H4	0 - 10 ppm	-	GD-K34PN-N2H4	X	X	X	X
Hydrogen H2	0 - 2000 ppm	GD-A8V-H2	GD-D8V-H2	X	X	X	X
Hydrogen (Direct) H2	0 - 2000 ppm	61-1050RK		X	X	X	-
Hydrogen (Specific) H2LEL	0 - 100%	61-1001RK		X	X	X	-
Hydrogen (4-20mA) H2	0 - 2000 ppm	65-2440RK		X	X	X	X
Hydrogen Bromide HBr	0 - 9 ppm	-	GD-K7D2 HBr	X	X	X	X
Hydrogen Chloride HCl	0 - 15 ppm	-	GD-K7D2 HCl	X	X	X	X
Hydrogen Chloride HCl	0 - 15 ppm	GD-K8A-HCL		X	X	X	X
Hydrogen Cyanide HCN	0 - 30 ppm	-	GD-K35PN HCN	X	X	X	X
Hydrogen Cyanide HCN	0 - 40 ppm	GD-K8A-HCN	GD-K7D2 HCN	X	X	X	X
Hydrogen Fluoride HF	0 - 9 ppm	-	GD-K7D2 HF	X	X	X	X
Hydrogen Selenide H2Se	0 - 0.2 ppm	-	GD-K35 H2Se	X	X	X	X
Hydrogen Sulfide H2S	0 - 1 ppm	-	GD-K7D2 H2S	X	X	X	X
Hydrogen Sulfide H2S	0 - 100 ppm	65-2422RK	-	X	X	X	X
Nitric Oxide NO	0 - 100 ppm	-	GD-K7D2 NO	X	X	X	X
Nitrogen Dioxide NO2	0 - 15 ppm	GD-K8A	GD-K7D2 NO2	X	X	X	X
Nitrogen Trifluoride NF3	0 - 30 ppm	-	GD-K8D NF3	X	X	X	X
Nitrogen Tetraoxide N2O4	0 - 15 ppm	-	GD-K7D2 N2O4	X	X	X	X
Oxygen (4-20mA) O2	0 - 25%	65-2504RK	-	X	X	X	X
Oxygen (Direct) O2	0 - 25%	65-2512RK	-	X	X	X	-
Ozone O3	0 - 1 ppm	GD-K8A-O3	GD-K7D2 O3	X	X	X	X
Phosphine PH3	0 - 1 ppm	GD-K8A-PH3	GD-K7D2 PH3	X	X	X	X
Phosphorus Pentafluoride PF5	0 - 9 ppm	-	GD-K7D2 PF5	X	X	X	X
Phosphorus Trichloride PCI3	0 - 15 ppm	GD-K8A-PCL3	GD-K7D2 PCI3	X	X	X	X
Phosphorus Trifluoride PF3	0 - 9 ppm	-	GD-K7D2 PF3	X	X	X	X
Silane SiH4	0 - 15 ppm	GD-K8A-SIH4	GD-K7D2 SiH4	X	X	X	X
Silicon Tetrachloride SiCl4	0 - 15 ppm	GD-K8A-SICL4	GD-K7D2 SiCl4	X	X	X	X
Silicon Tetrafluoride SiF4	0 - 9 ppm	-	GD-K7D2 SiF4	X	X	X	X
Sulfur Dioxide SO2	0 - 30 ppm	GD-K8A-SO2	GD-K7D2 SO2	X	X	X	X
Sulfur Tetrafluoride SF4	0 - 9 ppm	-	GD-K7D2 SF4	X	X	X	X
Tetraethyl Orthosilicate TEOS	0 - 15 ppm	-	GD-S8DG-TEOS	X	X	X	X
Trichlorosilane TCS	0 - 15 ppm	GD-S8DG-TCS	GD-K7D2 TCS	X	X	X	X
Tungsten Hexafluoride WF6	0 - 9 ppm	-	GD-K7D2 WF6	X	X	X	X
1,1,1-Trichloroethane C2H3Cl3	0 - 2000 ppm	GD-A8V	-	X	X	X	X



## Eagle Portable Gas Detector

### Description

The EAGLE is a powerful instrument that does more than offer standard confined space protection. The EAGLE also provides detection combinations never before offered in a portable gas monitor featuring the industry's widest selection of high quality, long life and field proven sensors.

The EAGLE's ergonomic design offers easy access to controls such as auto-calibration, alarm silence, demand zero, peak hold and a wide variety of other features. Each channel has 2 alarm levels plus TWA and STEL alarms for toxic channels. Alarm levels are adjustable and can be latching or self resetting. Standard features on the EAGLE, such as PPM/LEL hydrocarbon detection (5 ppm resolution) and a methane elimination switch for environmental applications are not available on most other competitive units. For quick response and recovery, the EAGLE has a strong internal pump that can draw samples from over 125 feet. The EAGLE will continuously operate for over 30 hours on alkaline batteries or 18 hours on rechargeable Ni-Cads. Many accessories such as long hoses, special probes, data-logging, continuous operation adapters, remote alarms and strobes, dilution fittings, internal hydrophobic filter, etc. are available to help satisfy almost any application. Rugged, weatherproof, easy to operate and maintain, the EAGLE is the industry's answer to portable gas detection.



### Ordering Information

Measurable Gas**	Range	Model Number
Ammonia	0-75 ppm	72-5111RK
Arsine	0-0.20 ppm	72-5107RKS
Arsine	0-1.0 ppm	72-5107RK
Carbon Dioxide	0-5000 ppm	72-5115RK-5K
	0-10000 ppm	72-5115RK-10K
	0-5%	72-5115RK-05
	0-20%	72-5115RK-20
	0-50%	72-5115RK-50
Carbon Monoxide	0-500 ppm	72-5104RK
Fluorine	0-5 ppm	72-5119RK
Hydrocarbon	0-100% LEL &	72-5101RK
	0-50,000 ppm	
Hydrogen Chloride	0-5 ppm	72-5110RK
Hydrogen Sulfide	0-100 ppm	72-5103RK
Nitrogen Dioxide	0-15 ppm	72-5114RK
Oxygen	0-40%	72-5102RK
Phosphine	0-1.0 ppm	72-5108RK
Silane	0-15 ppm	72-5117RK
Sulfur Dioxide	0-30 ppm	72-5105RK

Confined Space Instrument	(4 detectors in one housing)	72-5401RK
	Hydrocarbons	0 - 100% LEL
	Oxygen (O <sub>2</sub> )	0 - 40% Vol.
	Carbon Monoxide (CO)	0 - 500 ppm
	Hydrogen Sulfide (H <sub>2</sub> S)	0 - 100 ppm

*\*\*Included Accessories – Most Eagle units come with a 5' polyurethane hose, shoulder strap, four alkaline batteries, and a 10" hydrophobic probe as standard accessories. Units for toxic gases are supplied with a 3' Teflon hose without the hydrophobic filter.*

*\*\*Gases & Detectable Ranges - The EAGLE can be provided with many gas sensors not specifically listed above. Units can contain up to 6 gas sensors (4 Toxics maximum). Please specify the gases desired when requesting a quotation.*

### Features

- Simultaneous detection of up to 6 different gases
- Wide variety of field proven gas sensors available
- PPM / LEL hydrocarbon detection
- Powerful long-life pump with 125' range
- Low flow pump shut off and alarm
- Methane elimination switch for environmental use
- Security "Adjustment Lockout Switch"
- Up to 30 hours of continuous operation
- Alkaline or Ni-Cad capability
- Ergonomic RFI/EMI/Chemical resistant case
- Data-logging option
- Auto-calibration
- Intrinsically safe design (most versions), CSA/ NRTL & UL Classified

## Specifications for Eagle Portable Gas Detector

- **Enclosure**  
Weatherproof, chemical resistant, RF/EMI coated high impact poly-carbonate-polyester blend. Can be set in rain or into 2.5" water without damage. Ergonomically balanced with rugged top mounted handle.
- **Dimensions**  
10.5" long x 5.9" x 7" tall
- **Weight**  
5 lbs.
- **Detection Principle**  
Catalytic combustion, electrochemical cell, and infrared.
- **Sensor Life**  
2 years under normal conditions.
- **Sampling Method**  
Powerful, long-life pump (over 6,000 hours) can draw samples over 125 feet. Flow rate approximately 2.0 SCFH.
- **Display**  
4 x 20 LCD readout with backlighting. Viewed through window in case top. Display readings & status of all channels simultaneously.
- **Alarms**  
2 alarms per channel plus TWA and STEL alarms. Fully adjustable for levels, latching or self-reset and silenceable.
- **Alarm Method**  
*Buzzer 85dB at 30 cm, dual high intensity LED's, and blinking display.*
- **Controls**  
*6 external push buttons for operation, demand zero, and auto-calibration. Buttons also access LEL/ppm, alarm silence, peak hold, TWA/STEL values, battery status and many other features.*
- **Continuous Operating Hours**  
*30 hours minimum using alkaline batteries, or 18 hours Ni-Cads.*
- **Power Source**  
*Size D batteries, 4 alkaline or Ni-Cad, Charger has alkaline recognition to prevent battery damage if alkalines are charged.*
- **Operating Temp. & Humidity**  
-10°C to 40°C (14°F to 104°F), 0 to 95% RH, non-condensing.
- **Indication Accuracy**  
Maximum variance +/- 5% of full scale.
- **Response Time**  
30 seconds to 90% (for most gases).
- **Safety Design**  
Intrinsically Safe, Class I, Division 1, Groups A, B, C and D. CSA/NRTL & UL Classified (most versions).
- **Standard Accessories**  
Shoulder strap, alkaline batteries, hydrophobic probe, and 5 foot hose (for special toxic gas versions, shorter Teflon hose used without probe).
- **Optional Accessories**
  - Data-logging of up to 4 gases (No data-logging possible on 5 or 6 gas version or versions with more than 2 toxic sensors).
  - Remote alarm
  - Dilution fitting (50/50)
  - Ni-Cad batteries
  - Battery charger, 115 VAC or 12 VDC
  - Continuous Operation Adaptor, 115 VAC or 12 VDC
  - Extra loud buzzer
  - Extension probes
  - Internal Hydrophobic Filter (strong recommended)
- **Warranty**  
One year material and workmanship.

## Series 72 and 73

single gas personal monitor



4

Description	Features
<p>Individuals need personal protection in hazardous areas. The Series 01 units can provide the required protection at an affordable cost without the need to tote bulky equipment. These units are single gas monitors designed to protect personal from combustible hydrocarbons, oxygen deficiency, hydrogen sulfide, or carbon monoxide.</p> <p>The 01 series models have two preset alarms that are user adjustable. They are equipped with visual, audible, and vibration alarms. Replacement sensors are inexpensive, easily field replaceable, and have a life expectancy of 2 years.</p> <p>Each unit is controlled by a microprocessor for reliability and advanced capability. The two AAA size alkaline batteries provide continuous operation for 3000 hours, except the GP-01 LEL monitor which operates for 16 hours, but has a rechargeable Ni-Cad battery pack option that provides 8 hours of operation.</p>	<ul style="list-style-type: none"> <li>• Pocket size; 1.4" W x 4.1" H x 0.8" D.</li> <li>• Light weight: 3.5 ounces.</li> <li>• Audible/visual/vibration alarms.</li> <li>• Automatic backlight during alarm.</li> <li>• Peak Hold, STEL, &amp; TWA.</li> <li>• Low battery alarm.</li> <li>• Impact and water resistant.</li> <li>• Intrinsically safe, CSA, C/US classified Class 1, Division 1, Groups A, B, C, &amp; D.</li> </ul>

Ordering Information	
Model	Description
72-0008RK-01	0-40% OX-01 oxygen monitor with alkaline batteries & alligator clip
72-0008RK-03	0-40% OX-01 oxygen monitor with alkaline batteries & belt clip
73-0044RK-01	0-500 ppm CO-01 carbon monoxide with alkaline batteries & alligator clip
73-0044RK-03	0-500 ppm CO-01 carbon monoxide with alkaline batteries & belt clip
73-0046RK-01	0-100 ppm HS-01 hydrogen sulfide with alkaline batteries & alligator clip
73-0046RK-03	0-100 ppm HS-01 hydrogen sulfide with alkaline batteries & belt clip
73-0033RK-01	0-100% LEL GP-01 with alkaline batteries & alligator clip
73-0033RK-03	0-100% LEL GP-01 with alkaline batteries & belt clip
73-0034RK-04	0-100% LEL GP-01 with Ni-Cad battery pack, charger, & alligator clip
73-0034RK-05	0-100% LEL GP-01 with Ni-Cad battery pack, charger, & belt clip

**Description**

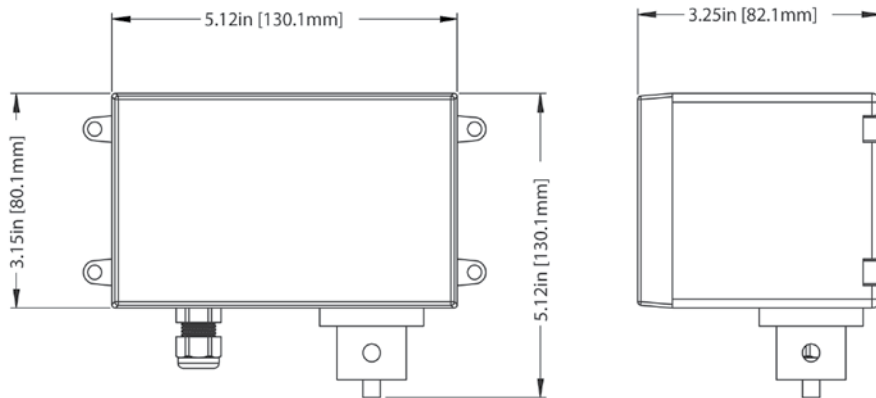
The 580 Series Oxygen Deficiency Monitor is a compact system that is ideal for the continuous monitoring oxygen levels in any area where inert gases or confined space may produce a hazardous reduction in the oxygen content of the air. This system should be installed in gas storage and use areas, cryogenic freezer rooms, laboratory or industrial locations where liquefied or compressed gases may accumulate and pose a hazard of asphyxiation as required by OSHA 29 CFR 1910. The unique long lasting zirconium sensor provides accurate and rapid response to changes in oxygen concentration over a wide range of temperature and humidity conditions and does not drift due to weather or temperature. For laboratories with incubators, grow rooms, and beverage manufacturing, the 5803007 adds excess carbon dioxide detection to the oxygen deficiency monitor to ensure a safe environment for breathing.



**Specifications**

Specifications			
<b>Gases Detected</b>	Oxygen or Oxygen/Carbon Dioxide	<b>Weight</b>	1.6 lb (0.8 kg)
<b>Range</b>	0-25% Oxygen, 0-10,000 ppm Carbon Dioxide	<b>Analog Outputs</b>	4-20 mA
<b>Accuracy</b>	±1% of full scale	<b>Relay Outputs</b>	Dual level + fault: 24 V (2 A)
<b>Operating Temperature</b>	32°F to 130°F (0°C to 55°C)	<b>Required Calibration</b>	None
<b>Display</b>	3/4" LCD digital display, back lit		
<b>Sensor Type</b>	Zirconium oxide (Oxygen), NDIR (Carbon Dioxide)		
<b>Sensor Life</b>	10 years under normal conditions		
<b>Power Requirements</b>	24 VDC (350 mA)		

**Installation Dimensions**



**Ordering Information**

Order No.	Description	Housing	Weight
580 3004	Oxygen Deficiency Monitor with 120VAC/24 VDC power supply	NEMA 4x (electronics and sensor)	1.6 lbs (0.8 kg)
580 3007	Oxygen/Carbon Dioxide Monitor with 120 VAC/24 VDC power su	Polycarbonate	1.6 lbs (0.8 kg)
580 3005	Remote Display (4-20 mA)	NEMA 4x	0.5 lbs (0.23 kg)
580 3006	Horn and Strobe [Red] (80-100 dB)	NEMA 4x	1.0 lbs (0.45 kg)

## Model 400 & Model 420

cylinder holding devices

OSHA regulations require compressed gas cylinders to be secured from toppling when in storage or in use. The devices shown here will help you comply with these regulations.

### Description

#### Wall Mount Cylinder Holder Model 400

This cast aluminum cylinder holder provides an easy way to secure cylinders to a wall, in a gas storage cabinet, or other stable surface. The holder is attached with bolts or lag screws using the pre-formed holes 7 inches apart. The holder can be used with cylinders from 4 to 14 inches in diameter. Cylinders are held firmly in place with a nylon strap fitted with a sturdy buckle, with an optional steel chain and hook, or both strap and chain.



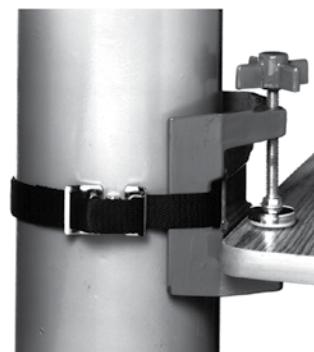
### Ordering Information

Model	Description
400	Wall mount cylinder holder with strap
400C	Wall mount cylinder holder with chain and hook
400CS	Wall mount cylinder with strap, chain and hook
400 RS	Replacement strap

### Description

#### Bench Type Cylinder Holder Model 420

This holder is designed to prevent toppling of cylinders when they are next to a lab or work bench and cannot be secured to a wall. The special screw clamp holds securely to a table top without marring the surface. The holder can be used with cylinders from 4 to 14 inches in diameter. Cylinders are held firmly in place with a nylon strap fitted with a sturdy buckle, with an optional steel chain and hook, or with both strap and chain.



### Ordering Information

Model	Description
420	Bench mount cylinder holder with strap
420C	Bench mount cylinder holder with chain and hook
420CS	Bench mount cylinder with strap, chain and hook
400 RS	Replacement strap

small & large cylinder stands

**Model 450 & Model 460**

4

**Description**

**Small Cylinder Stand  
Model 450**

This stand provides increased stability to cylinders with diameters of 4" to 7-3/8". It is constructed of nickel plated steel. Four thumb screws hold the stand securely to the cylinder. Stand height is 10".



**Non-tip Small Cylinder Stand  
Model 470**

This stand offers a convenient method of securing a 3-1/4" cylinder on a table or lab bench. The stand is made of light weight brushed aluminum, yet the large diameter base provides stability even when a regulator is installed on the cylinder.



**Description**

**Large Cylinder Stand  
Model 460**

This stand provides increased stability to cylinders with a diameter of 9" to 9-1/2" in situations where it is not possible to secure the cylinder to a wall or a bench with the model 400 or 420 cylinder holders. The cylinder can be rolled on and off with ease and is firmly held in place or quickly released by the cylinder holding band. With this unique design the cylinder rests on a steel plate and uses the cylinder's own weight to help keep the cylinder and stand stable and eliminate unsafe cylinder "ride up" that is common in some competitive models. Constructed of steel painted green.  
Dimensions: 18" x 18" x 12.5" high  
Weight: 13 lbs.



**Description**

**Lecture Bottle Holders**

Lecture bottles have rounded ends and require some means of support when in use. We provide two types of holders here that meet most requirements.

**Non-Tip Stand  
Model 475**

This stand offers a convenient method of securing a lecture bottle on a table or lab bench. The stand is made of light weight brushed aluminum, yet the large diameter base provides stability even when a regulator is installed on the bottle

**Wall Mount Lecture Bottle Bracket  
Model 480**

This bracket is made of powder coated steel and has spring steel clips that provide firm, secure support to the lecture bottle. The bracket is ideal for securing lecture bottles to lab cart or bench set-ups, in carrying cases for portable systems, or in storage cabinets.



## Series 465

cylinder floor stands

### Description

Available in two and three cylinder models, these floor stands are designed and built to provide safe storage of compressed gas cylinders with diameters up to 12" when a walk, post or bench is not available to secure the cylinder. Fully welded construction from 11 gauge and heavier plate steel and a quality epoxy powder paint finish provide structural integrity and long service life. Surfaces coming in contact with they cylinders are protected with vinyl edge guards. Cylinders are held securely in place with 1.5" polypropylene straps with steel cinch buckles.

### Ordering Information

Model	Description	Dimensions	Weight
465-2	Two cylinder floor stand	28" w x 30" h x 12" d	41 lbs
465-3	Three cylinder floor stand	40" w x 30" h x 12" d	56 lbs



**Description**

There are many situations where it would be more convenient to locate gas cylinders and distribution systems near the process, but away from a wall or other secure fixture. The “Gas Station” solves this problem. It can be located in any open area and support two or three cylinders and the associated gas distribution equipment. The stand is secured to the floor with bolts through the four pre-drilled holes provided in the base. Cylinders sit on the base plate and are securely held to the 2”x2” square tubular steel frame painted gray with sturdy nylon belts. A changeover manifold or other distribution equipment can be conveniently mounted to the plate above the cylinders. The unit is shipped unassembled via UPS. Assembly is easily accomplished in 10-15 minutes.

**Ordering Information**

**Model 495-2 Two Cylinder Gas Station**

Dimensions: 28” w x 72 1/2” h x 12” d  
Weight: 56 pounds

**Model 495-3 Three Cylinder Gas Station**

Dimensions: 40” w x 72” h x 12” d  
Weight: 78 pounds





## Series 490

cylinder storage racks

### Description

The storage compressed gas cylinders to comply with Federal, State and Local regulations often presents a number of problems. These new cylinder storage racks can help organize your cylinder storage and help you comply with the myriad of regulations.

Because the frame is pre-drilled to accommodate anchoring the rack to the floor they are ideal for situations where cylinder must be located away from a wall or other securing fixture. Racks are available in standard sizes to hold one to nine cylinders. Custom racks are available. Standard rack configurations are show below.

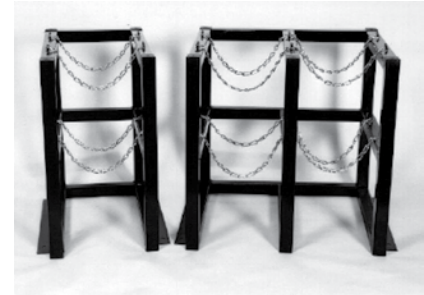
The unique design of square steel tubing (2" x 2") components welded together to form the frame provides the rigidity necessary to allow the frame to be constructed without a bottom. This allows cylinders to be rolled into the frame without lifting.

Racks are provided with either single or dual restraint steel chains to secure the cylinders. Single restraint racks secure the individual cylinders with a chain for each cylinder located at the top of the rack. Dual restraint models have a set of chains for each cylinder at 15" and 30" from the floor.

Racks are painted with black powder coating to provide long lasting protection. These cylinder storage racks meet the requirements of the National Fire Protection Association, National Fire Codes, Uniform Fire Codes, Uniform Building Codes and Seismic Zone 4 Restraint Regulations, Compressed Gas Association and OSHA.

### Features

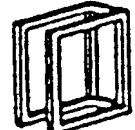
- Safe cylinder restraint
- Organized gas cylinder storage
- Simple Installation
- Uses space efficiently
- Removable and relocatable



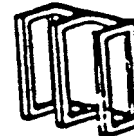
Gas cylinder restraint and storage



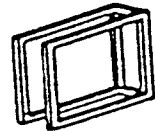
490-111



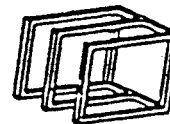
490-112



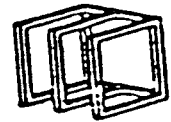
490-121



490-113



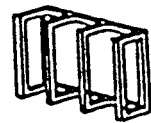
490-123



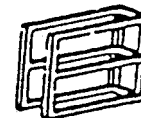
490-122



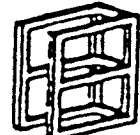
490-211



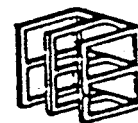
490-131



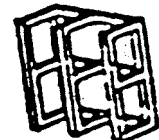
490-213



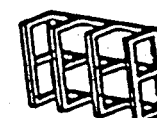
490-212



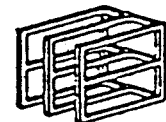
490-222



490-221



490-231



490-223

### Ordering Information

Model	Description	Nominal Dimensions
<b>Single restraint models</b>		
490-111	1 cyl wide x 1 cyl deep	16" w x 14" d x 30" h
490-121	2 cyl wide x 1 cyl deep	30" w x 14" d x 30" h
490-131	3 cyl wide x 1 cyl deep	44" w x 14" d x 30" h
490-112	1 cyl wide x 2 cyl deep	16" w x 26" d x 30" h
490-122	2 cyl wide x 2 cyl deep	30" w x 26" d x 30" h
490-132	3 cyl wide x 2 cyl deep	44" w x 26" d x 30" h
490-113	1 cyl wide x 3 cyl deep	16" w x 38" d x 30" h
490-123	2 cyl wide x 3 cyl deep	30" w x 38" d x 30" h
490-133	3 cyl wide x 3 cyl deep	44" w x 38" d x 30" h
<b>Dual restraint models</b>		
490-211	1 cyl wide x 1 cyl deep	16" w x 14" d x 30" h
490-221	2 cyl wide x 1 cyl deep	30" w x 14" d x 30" h
490-231	3 cyl wide x 1 cyl deep	44" w x 14" d x 30" h
490-212	1 cyl wide x 2 cyl deep	16" w x 26" d x 30" h
490-222	2 cyl wide x 2 cyl deep	30" w x 26" d x 30" h
490-232	3 cyl wide x 2 cyl deep	44" w x 26" d x 30" h
490-213	1 cyl wide x 3 cyl deep	16" w x 38" d x 30" h
490-223	2 cyl wide x 3 cyl deep	30" w x 38" d x 30" h
490-233	3 cyl wide x 3 cyl deep	44" w x 38" d x 30" h

All cylinder racks must ship motor freight

**Description**

These hand trucks are specially designed to hold and easily transport heavy compressed gas cylinder by persons of moderate strength. They feature welded tubular steel construction for strength. All models roll quietly and smoothly on large semi-pneumatic or solid rubber tired wheels and casters for better maneuverability over rough or uneven surfaces. Trucks are finished with green, scratch resistant, high gloss, electrostatically applied, oven baked powder coat.

**Model 6114  
Single Cylinder Hand Truck**

This unit is designed to handle one T or K type cylinder. It has two 4" rear casters, that fall into place when in use, to provide greater stability. The operator carries no load and has greater control over the truck. The rear wheel assembly is easily returned to the retracted position for storage. The cylinder is held securely on the truck by a safety chain.

**Model 6214  
Two Cylinder Hand Truck**

Designed to handle two T or K type cylinders the 6214 has longer handles for ease of mobility and good load control. Retractable 4" rear casters drop into place when needed for extra load handling safety or collapse and lock into the frame for storage. The truck has dual binding chains for extra security and solid 10" rubber front wheels.



## Series 7000

gas safety storage cabinets

4

### Description

Gas safety storage cabinets are designed to provide local exhaust gas control to enhance the safety of storing or using hazardous gases. 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.

When connected to a suitable exhaust system, air is drawn through the cabinet ensuring that any gas leakage is carried away and does not accumulate in the storage or work area. The cabinets can be fitted with manifolds or other gas controls so that both the cylinder and the control system are enclosed. When operators access the controls through the access window and a proper exhaust system is in operation, 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.



### Ordering Information

Model	Description
<b>7100</b>	one cylinder cabinet
<b>7200</b>	two cylinder cabinet
<b>7300</b>	three cylinder cabinet
<b>7400</b>	four cylinder cabinet
Options	Model
• Keyed door latch(es)	<b>7000-1</b>
• Keyed window latch(es)	<b>7000-2</b>
• Adjustable small cylinder shelf	<b>7000-3</b>

### Features

- All welded construction using 11 gauge steel, epoxy painted. Texture finish outside, smooth finish on inside of cabinet.
- Exhaust vent located on top of cabinet is 6" diameter x 3" high.
- 165° F. sprinkler head with bee's wax coating located in cabinet top.
- Cylinder brackets accommodate 7"-9" diameter cylinders. The brackets can move vertically and horizontally for precise pigtail alignment.
- Self-latching and closing window(s) with ¼" thick wire glass.
- Self-latching and closing door(s) with bottom louvers and flush mounted stainless steel paddle latch(es). Optional keyed latches available.
- All stainless steel fasteners.
- Meets or exceeds the Uniform Fire Code.

### Cabinet Physical Data

Model	Cylinder Capacity	Dimensions* Outside	Door Opening	Weight	Exhaust Flow Required (SCFM)
<b>7100</b>	one	18"w x 18"d x 72"h	16"w x 70"h	235 lbs.	175
<b>7200</b>	two	24"w x 18"d x 72"h	22"w x 70"h	283 lbs.	250
<b>7300</b>	three	36"w x 18"d x 72"h	left 22"w x 70"h right 16"w x 70"h	331 lbs.	450
<b>7400</b>	four	48"w x 18"d x 72"h	left 22"w x 70"h right 22"w x 70"h	391 lbs.	600

\*Overall cabinet height including exhaust vent is 75".

**C-Series Gas Cabinet Systems**

4

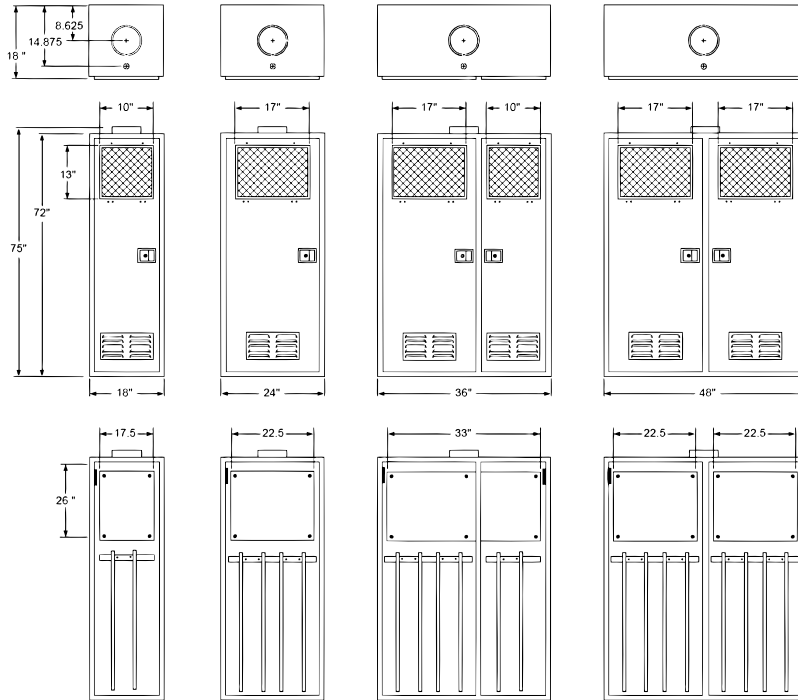
Description
<p>The CONCOA C-Series Gas Cabinet Systems are designed to provide unparalleled protection to both the mounted gas supply system and their attached gas cylinders. Constructed with sturdy 11-gauge thick steel, the cabinets are built to meet international fire codes. Cabinets come pre-installed with a 165°F (74°C ) sprinkler head near the exhaust vent. Cabinet doors and windows are made to close and latch automatically. The welded unibody construction and rigid cylinder brackets increase sturdiness of the cabinet in the event of fires or earthquakes.</p>



Custom Cabinets
<p>CONCOA designs and manufactures cabinets to suit any laboratory or analytical requirement. Possibilities include:</p> <ul style="list-style-type: none"> <li>• Cabinets with separate pressure controls to deliver multiple gases of similar composition that can be stored in the same location.</li> <li>• Cabinets for flammable gases that include emergency shut-off valves, gas detectors, and excess flow switches that can be integrated with a 585 Series emergency shut-off controller.</li> <li>• Cabinets for reactive gases that support a variety of purging options.</li> </ul> <p>Contact CONCOA for more information.</p>

Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <b>All Welded 11-Gauge Steel Construction</b> Protects cylinders and valves from damage</li> <li>• <b>Epoxy Painted</b> Tough, protective coating</li> <li>• <b>Sprinkler Head</b> Isolated fire protection</li> <li>• <b>Removable White Back Panel</b> Facilitates ease of maintenance</li> <li>• <b>Adjustable Brackets</b> Allow for precise hose alignment</li> <li>• <b>Automatic Closing Door and Window with Keyed Door Latch</b> Prevent unwanted access to cylinder and gas system</li> <li>• <b>Ventilation Louvers</b> Provide cabinet interior with adequate air flow circulation</li> </ul>	<p><b>Enclosure</b> 11-gauge (3mm) thick steel</p> <p><b>Paint</b> Epoxy Smooth interior, textured exterior</p> <p><b>Fasteners</b> Stainless Steel</p>	<p><b>Exhaust Duct</b> 6" (152mm) diameter 3" (76mm) high</p> <p><b>Sprinkler Head</b> 165°F (74oC ) activation point Beeswax coated</p> <p><b>Adjustable Cylinder Brackets</b> Accommodates 7" (177 mm) to 9" (228 mm) diameter cylinders. Chain and strap included.</p> <p><b>Fire-Rated Window</b> 1/4" thick clear wire glass</p> <p><b>Empty Weight</b> C1: 250 lbs (113 kg) C2: 275 lbs (125 kg) C3: 375 lbs (170 kg) C4: 470 lbs (213 kg)</p>

## Installation Information



## Ordering Information

Cabinet	Cylinders	Regulator/Switchover Part Number	Description
C	1: One	XXX XXXX-XXX	One cylinder cabinet system for 400, 300, and 200 Series regulators with 529 Protocol Station Systems.
	2: Two		Two cylinder cabinet system for use with 515, 526, 527, 530, and 540 Series systems, 529 Series Protocol Station systems, and with all 400, 300, and 200 Series regulators.
	3: Three		Three cylinder cabinet system for use with 515, 526, 527, 530, 540 and 542 Series systems, 529 Series Protocol Station systems, and with all 400, 300, and 200 Series regulators.
	4: Four		Four cylinder cabinet system for use with 515, 526, 527, 530, 540 and 542 Series systems, 529 Series Protocol Station systems and with all 400, 300, and 200 Series regulators.

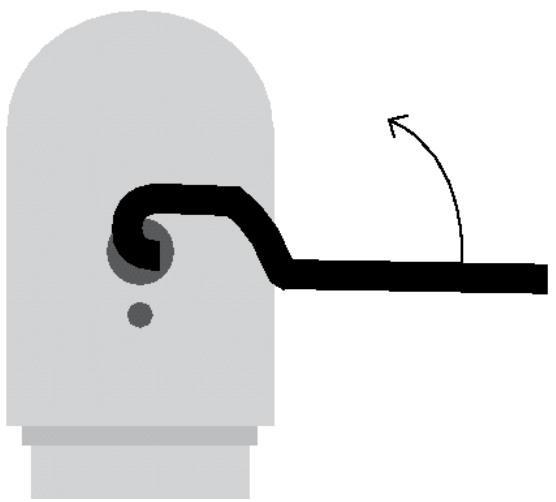
For example, to order a single-cylinder cabinet system with a 422 Series regulator with an outlet pressure range of 0-50 PSIG (0-3.5 BAR), a 0-4000 PSIG (0-275 BAR) inlet pressure gauge, a diaphragm valve with a 1/4" compression tube fitting, PSIG/kPa pressure gauges, and a CGA 350 connection for hydrogen service with Protocol Station, the part number would be: C1-4222331-350M. If ordering a 2-cylinder cabinet with a 527 Series switchover for hydrogen use, the part number would be: C2-5274171-350.

### Cabinets Without Installed Distribution Equipment

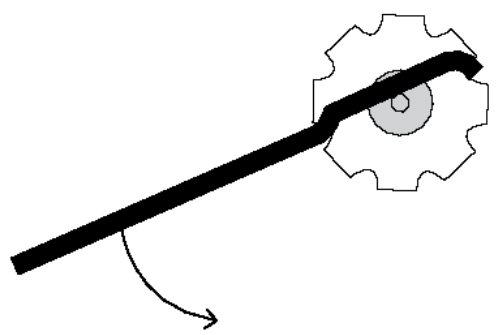
Cabinet	Order Number	Description
C1	518 2001	One cylinder cabinet
C2	518 2002	Two cylinder cabinet
C3	518 2003	Three cylinder cabinet
C4	518 2004	Four cylinder cabinet

cylinder wrenches **Model 90001, 90002, 90003**

Description
<p><b>Model 90001</b></p> <p>This universal cylinder wrench has 3 openings on one end (11/16", 1-1/8", 1-1/4") for tightening the various cylinder valve connections and most commonly used gas connections. The opposite end has 3/8" square box for opening cylinder valves that do not have hand wheels.</p>
<p><b>Model 90002</b></p> <p>This wrench has a basic 3/8" square for opening cylinder valves that do not have hand wheels, such as chlorine and hydrogen sulfide.</p>
<p><b>Model 90003</b></p> <p>The special configuration of this wrench provides an easy method of opening extra tight, hand wheel operated cylinder valves and removing difficult cylinder caps.</p>



Remove difficult cylinder caps



Open tight valves easily

## Series 601, 604, and 605

316 stainless steel flexible hose

### Description

Series 601 hoses are constructed of 1/4" I.D. Teflon® lined stainless steel braid, rated for 3000 psig. The 601 hoses are fitted with 1/4" NPT brass end connections; they make excellent economical manifold pigtails. The 602 hoses are fitted with 1/4" NPT stainless steel end connections.

The Series 604 hoses are constructed of double braided stainless steel, fitted with stainless steel 1/4" NPT end connections, rated for 3000 psig, and cleaned for oxygen service.



### Special Hoses

We can provide any of the hoses on this page in different lengths and with a wide variety of end fittings.

### Series 601

- 1/4" I.D. Teflon® lined 316 stainless steel braided hose
- Rated for 3000 psig
- 601 1/4" NPT female x 1/4" NPT female
- 601M 1/4" NPT male x 1/4" NPT male
- 601MF 1/4" NPT male x 1/4" NPT female
- Cleaned for oxygen service

### Series 604 and 605

- 1/4" I.D. 316 stainless steel double braided hose (605 Series has protective outer armor to provide greater safety and kink resistance.)
- Rated for 3000 psig
- 1/4" NPT female or male stainless steel end connections
- Cleaned for oxygen service

### Ordering Information

Model	Length	Model	Length	Model	Length
601-2	2.0 feet	604-2	2.0 feet	605-2	2.0 feet
601M-2	2.0 feet	604M-2	2.0 feet	605M-2	2.0 feet
601MF-2	2.0 feet	604MF-2	2.0 feet	605MF-2	2.0 feet
601-3	3.0 feet	604-3	3.0 feet	605-3	3.0 feet
601M-3	3.0 feet	604M-3	3.0 feet	605M-3	3.0 feet
601MF-3	3.0 feet	604MF-3	3.0 feet	605MF-3	3.0 feet
601-6	6.0 feet	604-6	6.0 feet	605-6	6.0 feet
601M-6	6.0 feet	604M-6	6.0 feet	605M-6	6.0 feet
601MF-6	6.0 feet	604MF-6	6.0 feet	605MF-6	6.0 feet

## Series 607C

Cryogenic transfer hoses

- 1/2" I.D. 316 stainless steel double braided hose with protective outer armor to provide greater safety and kink resistance
- Rated for 2150 psig
- 1/2" 45° flare female stainless steel connections (CGA 295) or 5/8" 45° flare (CGA 440) for oxygen
- Cleaned for oxygen service

### Ordering Information

Model	Length	Model
607C-4	for nitrogen and argon	4.0 feet
607C-6	for nitrogen and argon	6.0 feet
607C-4-440	for oxygen	4.0 feet
607C-6-6440	for oxygen	6.0 feet

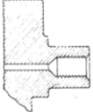

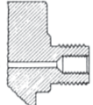
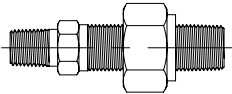
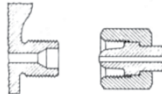

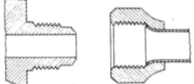
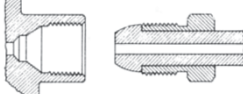
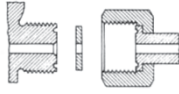


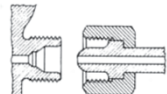


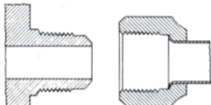
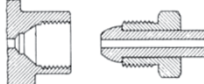
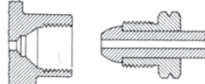
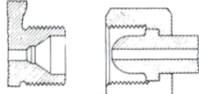
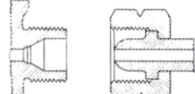
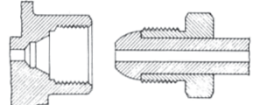



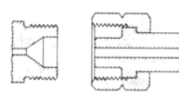
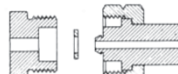
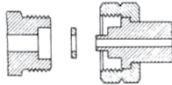
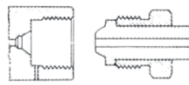
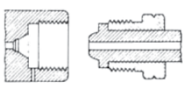

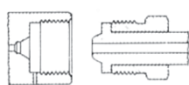

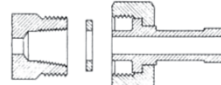
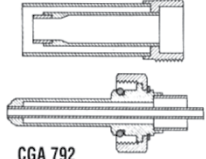
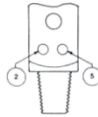
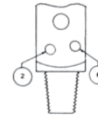
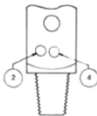
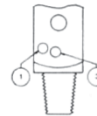
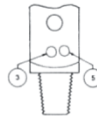
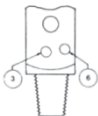
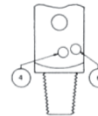
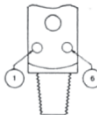
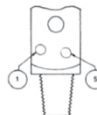
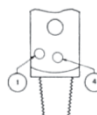
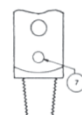
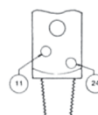


### Special Hoses

We can provide any of the hoses on this page in different lengths and with a wide variety of end fittings.

**CGA CONNECTIONS**

**CGA Connections Chart**

 <b>CGA 110</b> .3125-32UNEF-2B-RH-INT	 <b>CGA 165</b> .4375-20UNF-2A-RH-EXT (1/4 in. SAE Flare)	 <b>CGA 180</b> .825-18UNF-2A-RH-EXT	 <b>CGA 240</b> .375-18NGT-RH-INT	 <b>CGA 280</b> .745-14NGO-RH-EXT
 <b>CGA 290</b> .745-14NGO-LH-EXT	 <b>CGA 295</b> .750-16UNF-2A-RH-EXT (1/2 in. SAE Flare)	 <b>CGA 296</b> .804-14UNS-2B-RH-INT	 <b>CGA 320</b> .825-14NGO-RH-EXT (Flat Nipple)	 <b>CGA 326</b> .825-14NGO-RH-EXT (Small Round Nipple)
 <b>CGA 330</b> .825-14NGO-LH-EXT (Flat Nipple)	 <b>CGA 346</b> .825-14NGO-RH-EXT (Large Round Nipple)	 <b>CGA 347</b> .825-14NGO-RH-EXT (Long Round Nipple)	 <b>CGA 350</b> .825-14NGO-LH-EXT (Round Nipple)	 <b>CGA 440</b> .875-14UNF-2A-RH-EXT (5/8-in. SAE Flare)
 <b>CGA 500</b> .885-14NGO-RH-INT (Bullet Nipple)	 <b>CGA 510</b> .885-14NGO-LH-INT (Bullet Nipple)	 <b>CGA 540</b> .903-14NGO-RH-EXT	 <b>CGA 555</b> .903-14NGO-LH-EX	 <b>CGA 580</b> .965-14NGO-RH-INT
 <b>CGA 590</b> .965-14NGO-LH-INT	 <b>CGA 660</b> 1.030-14NGO-RH-EXT (Face Washer)	 <b>CGA 670</b> 1.030-14NGO-LH-EXT (Face Washer)	 <b>CGA 677</b> 1.030-14NGO-LH-EXT (Round Nipple)	 <b>CGA 678</b> 1.030-14NGO-LH-EXT (Recessed Washer)
 <b>CGA 679</b> 1.030-14NGO-LH-EXT (Tipped Nipple)	 <b>CGA 680</b> 1.045-14NGO-RH-INT	 <b>CGA 695</b> 1.045-14NGO-LH-INT	 <b>CGA 701</b> 1.103-14NGO-RH-EXT	 <b>CGA 702</b> 1.125-14NGO-RH-INT
 <b>CGA 703</b> 1.123-14NGO-LH-INT	 <b>CGA 705</b> 1.125-14UNS-2A-RH-EXT	 <b>CGA 792</b> 1.500-12UNF-2A-RH-EXT	 <b>CGA 870</b> PIN-INDEXED YOKE, PINS 2-5	 <b>CGA 880</b> PIN-INDEXED YOKE, PINS 2-6
 <b>CGA 890</b> PIN-INDEXED YOKE, PINS 2-4	 <b>CGA 900</b> PIN-INDEXED YOKE, PINS 1-3	 <b>CGA 910</b> PIN-INDEXED YOKE, PINS 3-5	 <b>CGA 920</b> PIN-INDEXED YOKE, PINS 3-6	 <b>CGA 930</b> PIN-INDEXED YOKE, PINS 4-6
 <b>CGA 940</b> PIN-INDEXED YOKE, PINS 1-6	 <b>CGA 950</b> PIN-INDEXED YOKE, PINS 1-5	 <b>CGA 960</b> PIN-INDEXED YOKE, PINS 1-4	 <b>CGA 965</b> PIN-INDEXED YOKE, PIN NO. 7	 <b>CGA 973</b> PIN-INDEXED YOKE, PINS 11-24



## Cylinder Connections

4

Description	Ordering Information			
	Connection	Brass	Stainless Steel	Chrome-Plated Brass
Regulator inlet connections are available for most worldwide standards. Each connection includes nut, gland, and washer (if appropriate) on the inlet side to connect to the cylinder and ¼" MPT connection on the outlet side to connect to the inlet of any PurityPlus regulator. CGA (Compressed Gas Association) connections are manufactured in accordance with CGA standard V-1 (1997). BS (British Standard) connections are manufactured in accordance with BS 341(1990) and DIN (German Industrial Standards Organization) connections are manufactured in accordance with DIN 477 (1991). Please consult the gas supplier or appropriate standard to determine the correct connection for particular gases. Other international standard connections are available upon request.	CGA 170	N/A	550-1004-170	550-1009-170
	CGA 180	N/A	550-1004-180	550-1009-180
	CGA 240	N/A	N/A	N/A
	CGA 280	N/A	N/A	550-1009-280
	CGA 290	N/A	550-1004-290	N/A
	CGA 296	550-1002-296	550-1004-296	550-1009-296
	CGA 300	550-1002-300	550-1004-300	550-1009-300
	CGA 320	550-1002-320	550-1004-320	550-1009-320
	CGA 326	550-1002-326	550-1004-326	550-1009-326
	CGA 330	N/A	N/A	N/A
	CGA 346	550-1002-346	550-1004-346	550-1009-346
	CGA 347	550-1002-347	550-1004-347	550-1009-347
	CGA 350	550-1002-350	550-1004-350	550-1009-350
	CGA 500	N/A	N/A	550-1009-500
	CGA 510	550-1002-510	550-1004-510	550-1009-510
	CGA 540	550-1002-540	550-1004-540	550-1009-540
	CGA 555	550-1002-555	550-1004-555	550-1009-555
	CGA 577	550-1002-577	550-1004-577	550-1009-577
	CGA 580	550-1002-580	550-1004-580	550-1009-580
	CGA 590	550-1002-590	550-1004-590	550-1009-590
	CGA 660	N/A	N/A	N/A
	CGA 670	N/A	550-1004-670	N/A
	CGA 677	N/A	N/A	N/A
	CGA 679	N/A	N/A	N/A
	CGA 680	550-1002-680	550-1004-680	550-1009-680
	CGA 695	550-1002-695	550-1004-695	550-1009-695
	CGA 702	N/A	N/A	N/A
	CGA 703	N/A	N/A	N/A
	CGA 705	N/A	N/A	N/A
	BS 341 #01	550-1002-B01	N/A	550-1009-B01
	BS 341 #02	550-1002-B02	550-1004-B02	550-1009-B02
	BS 341 #03	550-1002-B03	550-1004-B03	550-1009-B03
	BS 341 #04	550-1002-B04	550-1004-B04	550-1009-B04
	BS 341 #08	550-1002-B08	550-1004-B08	550-1009-B08
	BS 341 #10	N/A	550-1004-B10	N/A
	BS 341 #13	550-1002-B13	550-1004-B13	550-1009-B13
	BS 341 #14	550-1002-B14	550-1004-B14	550-1009-B14
	BS 341 #15	550-1002-B15	550-1004-B15	550-1009-B15
	DIN 477 #01	550-1002-D01	550-1004-D01	550-1009-D01
	DIN 477 #03	550-1002-D03	N/A	550-1009-D03
DIN 477 #05	N/A	550-1004-D05	N/A	
DIN 477 #06	550-1002-D06	550-1004-D06	550-1009-D06	
DIN 477 #07	N/A	550-1004-D07	N/A	
DIN 477 #08	N/A	550-1004-D08	N/A	
DIN 477 #09	550-1002-D09	N/A	550-1009-D09	
DIN 477 #10	550-1002-D10	550-1004-D10	550-1009-D10	
DIN 477 #11	550-1002-D11	N/A	550-1009-D11	
DIN 477 #12	550-1002-D12	N/A	550-1009-D12	
DIN 477 #13	550-1002-D13	N/A	550-1009-D13	
DIN 477 #14	550-1002-D14	550-1004-D14	550-1009-D14	
DIN 477 #15	550-1002-D15	550-1004-D15	550-1009-D15	

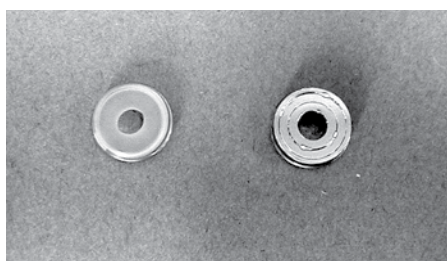
**UHP (DISS) Cylinder Connections**

4

Description	Features
This special group of cylinder connections was developed through the cooperation of industry and the Compressed Gas Association for use with ultra purity gases primarily used in conjunction with semiconductor chip manufacturing applications. The sealing surfaces are similar to a face seal connection used with tubing and they require either a nickel gasket or Kel-F gasket to achieve a seal. They are only available in stainless steel.	<ul style="list-style-type: none"> <li>Available with in three mating styles                             <ul style="list-style-type: none"> <li>1/4" face seal male</li> <li>1/4" NPT male</li> <li>1/4" tube stub</li> </ul> </li> <li>Supplied as a set nut, nipple, and nickel gasket</li> </ul>

Ordering Information			
Model	Description	Model	Description
DISS632-P4M	632 x 1/4" NPT male	DISS714-P4M	714 x 1/4" NPT male
DISS632-V4M	632 x 1/4" male face seal	DISS714-V4M	714 x 1/4" male face seal
DISS632-T4S	632 x 1/4" tube stub	DISS714-T4S	714 x 1/4" tube stub
DISS634-P4M	634 x 1/4" NPT male	DISS716-P4M	716 x 1/4" NPT male
DISS634-V4M	634 x 1/4" male face seal	DISS716-V4M	716 x 1/4" male face seal
DISS634T4S	634 x 1/4" tube stub	DISS716-T4S	716 x 1/4" tube stub
DISS636-P4M	636 x 1/4" NPT male	DISS718-P4M	718 x 1/4" NPT male
DISS636-V4M	636 x 1/4" male face seal	DISS718-V4M	718 x 1/4" male face seal
DISS636-T4S	636 x 1/4" tube stub	DISS718-T4S	718 x 1/4" tube stub
DISS638-P4M	638 x 1/4" NPT male	DISS720-P4M	720 x 1/4" NPT male
DISS638-V4M	638 x 1/4" male face seal	DISS720-V4M	720 x 1/4" male face seal
DISS638-T4S	638 x 1/4" tube stub	DISS720-T4S	720 x 1/4" tube stub
DISS640-P4M	640 x 1/4" NPT male	DISS722-P4M	722 x 1/4" NPT male
DISS640-V4M	640 x 1/4" male face seal	DISS722-V4M	722 x 1/4" male face seal
DISS640-T4S	640 x 1/4" tube stub	DISS722-T4S	722 x 1/4" tube stub
DISS642-P4M	642 x 1/4" NPT male	DISS724-P4M	724 x 1/4" NPT male
DISS642-V4M	642 x 1/4" male face seal	DISS724-V4M	724 x 1/4" male face seal
DISS642T4S	642 x 1/4" tube stub	DISS724-T4S	724 x 1/4" tube stub
DISS712-P4M	712 x 1/4" NPT male	DISS726-P4M	726 x 1/4" NPT male
DISS712-V4M	712 x 1/4" male face seal	DISS726-V4M	726 x 1/4" male face seal
DISS712-T4S	712 x 1/4" tube stub	DISS726-T4S	726 x 1/4" tube stub

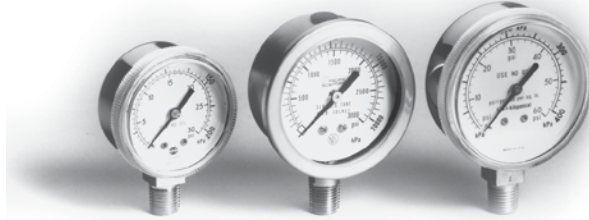
**DISS Gaskets**



Description
All DISS connections require a gasket to achieve a leak-free connection. Gaskets should be changed each time the connection is attached to the cylinder valve.

Ordering Information	
Model	Length
DISS-NI	Nickel gasket for CGA 632 thru 726
DISS-K	Kel-F gasket for CGA 632 thru 726

## Pressure Gauges



4

Description	Features
The selection of brass, stainless steel, and monel® gauges presented here represent those used on pressure regulators offered in this catalog. They can be used as repair parts or for installation in other systems.	<ul style="list-style-type: none"> <li>• 1/4" NPT lower male connection</li> <li>• Cleaned for oxygen service - brass and stainless steel only</li> </ul>

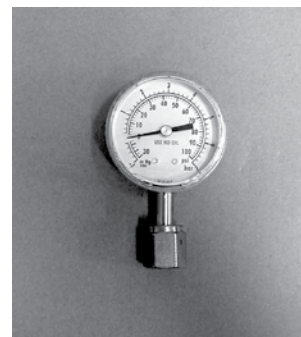
Ordering Information					
Brass with Brass Case - 2-1/2" Dia.		316 Stainless Steel with Stainless Steel Case - 2-1/2" dia.		Monel® with Stainless Steel Case 2-1/2" dia.	
Model	Pressure Range psi	Model	Pressure Range psi	Model	Pressure Range psi
9131-4PM-0015	0-15	9132-4PM-3030	30" 0-30	9133-4PM-0100	0-100
9131-4PM-0030	0-30	9132-4PM-0030	0-30	9133-4PM-0300	0-300
9131-4PM-0060	0-60	9132-4PM-0060	0-60	9133-4PM-1000	0-1000
9131-4PM-0100	0-100	9132-4PM-0100	0-100	9133-4PM-3000	0-3000
9131-4PM-0200	0-200	9132-4PM-0200	0-200		
9131-4PM-0400	0-400	9132-4PM-0400	0-400		
9131-4PM-1000	0-1000	9132-4PM-1000	0-1000		
9131-4PM-2000	0-2000	9132-4PM-2000	0-2000		
9131-4PM-4000	0-4000	9132-4PM-3000	0-3000		
9131-4PM-6000	0-6000	9132-4PM-6000	0-6000		
9131-4PM-7500	0-7500	9132-4PM-10000	0-10000		

Other sizes and ranges available.

## Gauges with Face Seal Fittings

Description	Features
On some high purity regulators the gauges are connected to the regulator body by using face seal fittings rather than NPT threads.	<ul style="list-style-type: none"> <li>• 1/4" female face seal connection</li> <li>• Dual scale dial psig/bar</li> <li>• Cleaned for oxygen service</li> </ul>

Ordering Information	
316 stainless steel with stainless steel case - 2" dia.	
Model	Pressure Range
9122-4VM-3030	30" vac.-0-30 psig (-1.0-2 bar)
9122-4VM-3060	30" vac.-0-60 psig (-1.0-4 bar)
9122-4VM-3100	30" vac. - 0-100 psig (-1.0-7 bar)
9122-4VM-0200	0-200 psig (0-14 bar)
9122-4VM-0400	0-400 psig (0-28 bar)
9122-4VM-1000	0-1000 psig (0-70 bar)
9122-4VM-4000	0-4000 psig (0-280 bar)



in-line filter

**Series 7500**

**Features**

- Compact in-line design with large filtration area
- Sintered 316 stainless steel element
- Choice of 1, 2, 5, 10, 50 or 100 micron filter element

**Specifications**

Operating Pressure: Brass: 3000 psig  
316 SS: 6000 psig\*  
Operating Temp: Brass: -30°F to 275°F  
316 SS: -15°F to 400°F

**Materials of Construction**

Model	Body	Seals	Filter Element
7510	Brass	Buna-N	316 stainless steel
7520	316 SS	Viton	316 stainless steel



**Ordering Information**

Model	Inlet and Outlet Connection
7510-X-P4MM	1/4" NPT male x 1/4" NPT male
7510-X-P4FF	1/4" NPT female x 1/4" NPT female
7510-X-T4FF	1/4" compression x 1/4" compression
7510-X-P8MM	1/2" NPT male x 1/2" NPT male
7510-X-P8FF	1/2" NPT female x 1/2" NPT female
7520-X-P4MM	1/4" NPT male x 1/4" NPT male
7520-X-P4FF	1/4" NPT female x 1/4" NPT female
7520-X-T4FF	1/4" compression x 1/4" compression
7520-X-P8MM**	1/2" NPT male x 1/2" NPT male
7520-X-P8FF**	1/2" NPT female x 1/2" NPT female

Other end fitting configurations are available.  
X - Specify filter element 1, 2, 5, 10, 50, or 100 microns.  
\* 2 micron filter operating pressure is 3000 psig  
\*\* 2 micron filter not available in 1/2" units

gas heaters

**Series 6284**

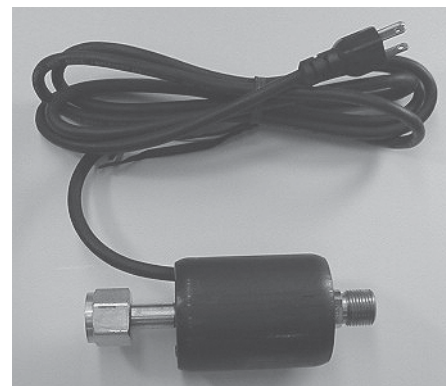
**Description**

The series 6284 gas heaters when installed between the cylinder and the regulator are designed to reduce the problem of regulator icing that is associated with high flow withdrawal rates of some gases due to their expansion from high pressure to low pressure.

This thermostatically controlled heater will not overheat the gas and can be left unattended without any gas flow. A pilot light indicates when the thermostat is closed and the heating element is operative.

**Specifications**

Material: Steel case with black oxide finish covering a solid brass body  
Max. flow: 90 cubic feet/hour  
Voltage: 115 volt single phase 60 hz, 200 watts provided through a 5-foot grounded cord with molded plug.  
Heating Range: Thermostat between 160° - 190°F.  
Outer case temperature 85°F  
Dimensions: 6-5/8" overall length, 2-1/2" diameter.  
Weight: 2 pounds



**Ordering Information**

Model	Application
<b>6284-320</b>	<b>Carbon Dioxide</b>
6284-326	Nitrous Oxide
6284-580	Argon

## Series 9900

low gas pressure alarm



Regulator sold separately

4

Description	Features
<p>The Series 9900 complies with the requirements of NFPA 99 2002 paragraph 5.1.10.5.5 that mandates the continuous monitoring of purge gas while welding or brazing gas lines.</p> <p>These alarms are ideal for any gas application where a decrease in gas pressure could be detrimental to the operation.</p> <p>Rated for 3000 psig the Series 9900 can be installed between the cylinder valve and the user's pressure regulator or system. At low pressure, the Series 9900 provides both an audible and visual alert to the user when the container pressure reaches the pre-set level. Units are available in brass or stainless steel with the appropriate CGA connections for easy installation between an existing cylinder and regulator, or with pipe threads or compression fittings for permanent installation into a gas supply system.</p> <p>Standard models require 110 VAC power. For remote locations or where power is not readily available there are battery-powered models that operate on a standard 9V battery.</p>	<ul style="list-style-type: none"> <li>• Wide range of alarm pressure selection</li> <li>• Available in brass or stainless steel</li> <li>• Available with CGA connections or 1/4" NPT female inlet and outlet</li> <li>• Complies with the requirements of NFPA 99 2002 paragraph 5.1.10.5.5</li> <li>• Choice of power source - 110 VAC, 9V battery</li> <li>• Provides both an audio (~90 dB @ 10 feet) and a visual alarm</li> <li>• Mating inlet and outlet connections</li> </ul>

### Ordering Information

Replace the PSI in P/N with the desired activation pressure)

Model Number	Description
9910-PSI-CGA	110 VAC brass unit with audio/visual alarm and silence button
9911-PSI-CGA	9 volt brass unit with audio/visual alarm and on/off switch (no silence button)
9910-PSI-P4FF	110 VAC brass unit with audio/visual alarm and silence button - 1/4" NPTF
9911-PSI-P4FF	9 volt brass unit with audio/visual alarm and on/off switch (no silence button)
9920-PSI-CGA	110 VAC SS unit with audio/visual alarm and silence button
9921-PSI-CGA	9 volt SS unit with audio/visual alarm and on/off switch (no silence button)
9920-PSI-P4FF	110 VAC SS unit with audio/visual alarm and silence button - 1/4" NPTF
9921-PSI-P4FF	9 volt SS unit with audio/visual alarm and on/off switch (no silence button)

**Purge Assemblies**

4

**Description**

The installation of a purge assembly on the inlet of your pressure regulator, pigtail inlet, or gas control system is highly recommended anytime a toxic, corrosive, flammable, or ultra high purity gas is to be used in the system. Purge assemblies perform the following multiple functions in your gas system during cylinder change-overs:

- Eliminate the release of toxic, corrosive, or flammable gases into the workplace.
- Maintain the integrity of an ultra high purity system.
- Protect equipment in corrosive gas service from exposure to moisture, thus preventing destructive corrosion.

**Deep Purge Valve System  
Series 4800**

**Description**

The Series 4800 deep purge valve system provides the ultimate in purging capability in a compact design with a very small internal volume. These units can be used in a wide variety of applications where contamination must be avoided during cylinder changeovers.

The deep purge valve system is an ideal accessory installed between the cylinder and the regulator of ultra high purity carrier lines for gas chromatography systems that cannot tolerate even a minimum amount of oxygen and moisture that can enter the system during cylinder changeovers.

The deep purge valve system can be used with gas mixtures containing reactive components to ensure that no moisture enters the sampling system to cause deterioration of the reactive components that can lead to concentration inaccuracies. Use of the 4820 also provides protection from the release of toxic gases into the atmosphere during cylinder changeovers.



**Ordering Information**

Model	Material of Construction	Valve Type	Connections	
			Inlet	Outlet
4820-P4FF	stainless steel	multi-turn	1/4" NPT female	1/4" NPT female
4820-P4FM	stainless steel	multi-turn	1/4" NPT female	1/4" NPT male (3" nipple)
4820-CGA	stainless steel	multi-turn	specify CGA	1/4" NPT male (3" nipple)
4821-P4FF	stainless steel	90° lever	1/4" NPT female	1/4" NPT female
4821-P4FM	stainless steel	90° lever	1/4" NPT female	1/4" NPT male (3" nipple)
4821-CGA	stainless steel	90° lever	specify CGA	1/4" NPT male (3" nipple)
4822-CGA	stainless steel	multi-turn	specify CGA	mating CGA
4823-CGA	stainless steel	90° lever	specify CGA	mating CGA

## Series 4500

tee purge assemblies

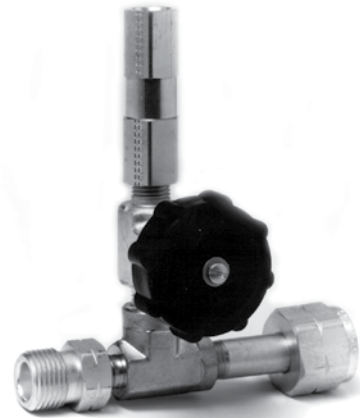
### Description

The Series 4500 tee purge assemblies are designed to be installed between the cylinder valve and the pressure regulator. They enable the user to purge the system through the regulator with an inert gas.

The Series 4500 units feature multi-turn diaphragm packless valves and a check valve installed on the purge gas inlet. They are rated for 3000 psig.

### Ordering Information

Model	Material of Construction
4510-CGA*	brass
4520-CGA*	stainless steel
4550-CGA*	monel® and Al-Si-Bronze



## Series 4600

tee purge assemblies



### Description

The Series 4600 tee purge assembly was designed for use with inert gases such as argon, helium, and nitrogen. When installed either on the inlet to a pressure regulator or on the cylinder end of a pigtail they are an ideal device for purging the cylinder inlet connection after cylinder changeover to eliminate the introduction of oxygen and water to the system. These tee purges conveniently use the gas in the cylinder for purging.

The Series 4600 can be constructed either with multi-turn or 90° lever actuated diaphragm packless valves. This entire assembly is designed to pass a helium leak rated of 1 x 10-9 sccm. They are rated for 3000 psig.

### Ordering Information

Model*	Materials of Construction	Connections	
		Inlet	Outlet
4610-P4FF multi-turn	brass	1/4" NPT female	1/4" NPT female
4611-P4FF 90° lever	brass	1/4" NPT female	1/4" NPT female
4610-CGA multi-turn	brass	specify CGA	1/4" NPT female
4611-CGA 90° lever	brass	specify CGA	1/4" NPT female
4611M-CGA multi-turn	brass	specify CGA	1/4" NPT male
4611M-CGA 90° lever	brass	specify CGA	1/4" NPT male
4610F-CGA multi-turn	brass	specify CGA	1/4" NPT female
4611F-CGA 90° lever	brass	specify CGA	1/4" NPT female
4612-CGA multi-turn	brass	specify CGA	mating CGA
4613-CGA 90° lever	brass	specify CGA	mating CGA
4620-P4FF multi-turn	ss	1/4" NPT female	1/4" NPT female
4621-P4FF 90° lever	ss	1/4" NPT female	1/4" NPT female
4620-CGA multi-turn	ss	specify CGA	1/4" NPT female
4621-CGA 90° lever	ss	specify CGA	1/4" NPT female
4620M-CGA multi-turn	ss	specify CGA	1/4" NPT male
4621M-CGA 90° lever	ss	specify CGA	1/4" NPT male
4620F-CGA multi-turn	ss	specify CGA	1/4" NPT female
4621F-CGA 90° lever	ss	specify CGA	1/4" NPT female
4622-CGA multi-turn	ss	specify CGA	mating CGA
4623-CGA 90° lever	ss	specify CGA	mating CGA

\*Specify CGA connection required when ordering

deep purges

**502 Series**

**Description**

The 502 Series Deep Purge is CONCOA's most effective purge device. It incorporates a unique snorkel tube design that forces the purge gas all the way back through the inlet connection to the cylinder valve cavity assuring virtual zero dead space purging. The Deep Purge may be used to purge the entire regulator body or just the cylinder connection at the time of cylinder change. The Deep Purge performs a positive displacement or cycle purge of the system.



**Materials and Specifications**

Seat	PCTFE
Diaphragm (Purge Valves)	Elgiloy®
Diaphragm (Center Valves)	Elgiloy®
Seals	Metal-to-Metal
Cv	0.17
Maximum Pressure	3500 PSIG (240 BAR)

**Ordering Information**

Order No.	Body Material	Purge Type	Weight
502 3009-CON	316L stainless steel	Deep Purge (multi-turn valves)	3.0 lbs. (1.35 kg)
502 3010-CON	316L stainless steel	Deep Purge (quarter-turn valves)	3.0 lbs. (1.35 kg)

tee purges

**502 Series**

**Description**

The 502 Series purges are designed for use with high purity gases to ensure system integrity upon breakdown of components or during gas source changes. Purges provide safety by preventing the release of toxic or corrosive gases into the workplace when changing cylinders, corrosion resistance by preventing corrosive or halogen gases from coming into contact with atmospheric moisture, and purity by preventing air from infiltrating high purity systems at the time of cylinder change. Tee purges are available in two configurations. An inboard purge allows inert gas to enter the system for displacement or cycle purging. An outboard purge permits a process or inert purge gas to safely exit the system. The two tee purge types can be used together in a "block and bleed" configuration to effectively purge any system.

**Materials and Specifications**

Seat	PCTFE
Diaphragm	Elgiloy®
Seals	Metal-to-Metal®
Check Valve Seat	Viton® for brass Ethylene propylene for stainless steel
Maximum Pressure	3000 PSIG (210 BAR)



**Ordering Information**

Order No.	Body Material	Purge Type	Weight
502 2003-CON	Brass	Tee purge	2.5 lbs. (1.12 kg)
502 2005-CON	316L stainless steel	Tee purge	2.5 lbs. (1.12 kg)
502 2010	Brass	Right inlet process purge	2.5 lbs. (1.12 kg)
502 2011	Brass	Left inlet process purge	2.5 lbs. (1.12 kg)
502 2015	316L stainless steel	Right inlet process purge	2.5 lbs. (1.12 kg)
502 2016	316L stainless steel	Left inlet process purge	2.5 lbs. (1.12 kg)



## 585 Series

emergency shut off controller

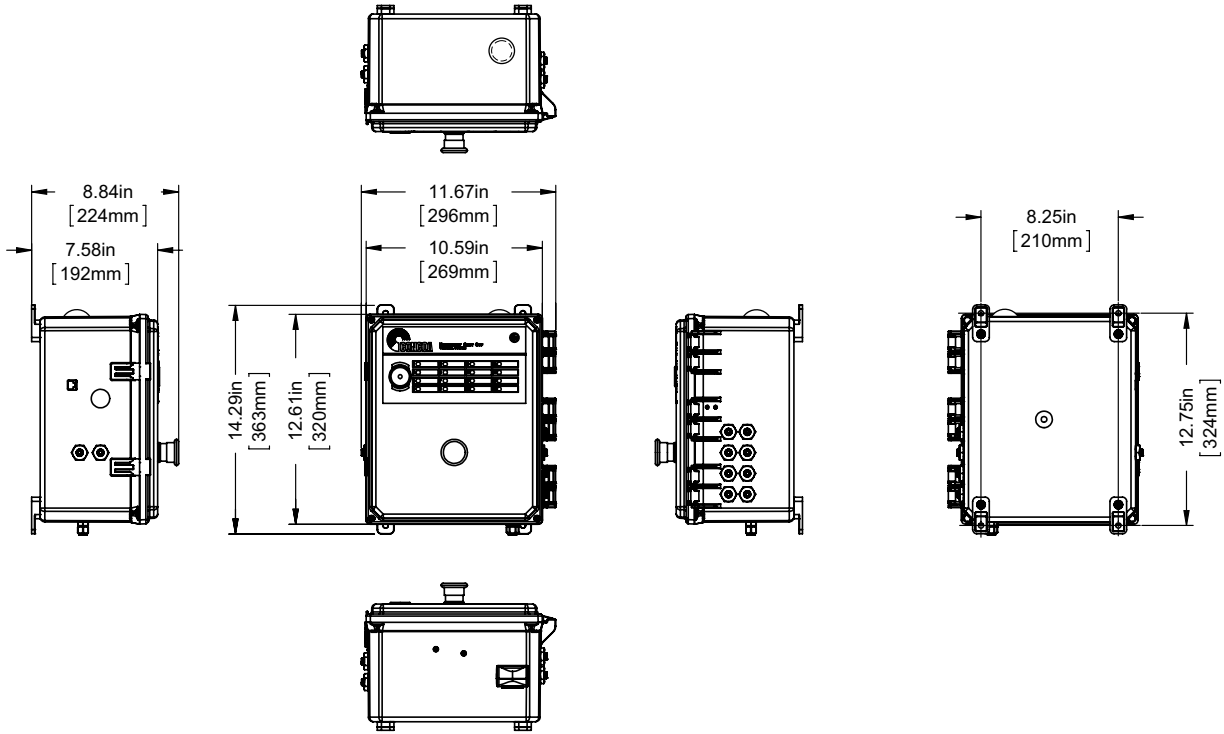
### Description

The CONCOA 585 Series emergency shut off controller is designed to automatically shut down up to eight independent flammable, toxic, corrosive, or high purity gas sources for safety or process control. The Controller includes an integral emergency stop button, audible and visual alarm, six programmable input relays, and up to eight programmable pneumatic output ports for control of high purity CONCOA 586 Series emergency shut off valves. Eight additional output relays are configurable as normally open or normally closed for integration with a building or master alarm system. The status of all eight inputs and outputs are displayed with high visibility, multicolor LEDs so that the triggering event is identified and the status of all output ports is shown. Ideal for flammable or toxic gas shutdown control in the event of fire or leak detection, the controller can be configured to operate the eight pneumatic outputs in unison or independently. The system comes with on board and web server for monitoring and program status with email and real time display.



Features	Materials	Specifications
<ul style="list-style-type: none"> <li>• <i>Highly Programmable Controller</i> Customize for specific installations</li> <li>• <i>Eight Integrated Solenoid Valves</i> Easy system installation</li> <li>• <i>Integral Emergency Stop Button</i> Manual activation at the controller</li> <li>• <i>Six Input Relays</i> Accommodate multiple gas streams</li> <li>• <i>Onboard Web and Mailer Server</i> Enables remote monitoring and notification</li> <li>• <i>Eight Output Relays</i> Flexible system integration</li> <li>• <i>Event Log</i> Auditable trail of uptime and failure</li> </ul>	<p><i>Enclosure</i> Polycarbonate resin (flame retardant and UV stabilized)</p> <p><i>Cover Assembly</i> Screw closure</p> <p><i>Mounting Assembly</i> Polycarbonate resin (flush)</p> <p><i>Weight</i> 9.8 lbs. (4.45 kg)</p>	<p>Sound 93 dB audible alarm</p> <p><i>Power Input</i> 90-264 VAC external power supply (US, UK, European, Australian, and Chinese adapters included)</p> <p>Pneumatic Outputs (8) 1/8" FPT bulkheads (hose barb and plug supplied)</p> <p>Pneumatic Inputs (1) 1/8" FPT</p> <p><i>Dry Contact Outputs (8)</i> NO or NC (field adjustable)</p> <p><i>Relay Inputs (8)</i> 6 NO or NC (field adjustable) 1 NO (emergency stop button) 1 NO (pneumatic air pressure switch)</p> <p>Relay Contact Rating .5 A@24V</p>

Installation Dimensions



Ordering Information

Order No.	Description
585 1008	Emergency shut off controller

Options

Order No.	Description
586 1001	Emergency shut off single valve kit
586 1002	Emergency shut off dual valve kit
586 2001	Emergency shut off high flow single valve kit
586 2002	Emergency shut off high flow dual valve kit
585 2001	Emergency shut off button
586 9001	Single tube soft polymer tubing for connecting controller to valve kits
580 4001	High pressure, low flow excess flow switch
580 4002	Low pressure, high flow excess flow switch
580 4003	High pressure, high flow excess flow switch

## 585 Series

emergency stop button

### Description

The 585 Series Emergency Stop Button provides a remote means of initiating emergency shutdown of any gas supply connected to the 585 series Emergency Shut Off Controller with 586 Series Emergency Shutdown valves. With a highly visible red push to lock, twist to reset stop button, the normally closed relay is safely housed inside a bright yellow NEMA 4 control box. Once pushed, the normally closed relay opens and signals shutdown to the controller. Easy installation is achieved with multiple knockouts for conduit or cable wiring, and custom units may be ordered on request. The emergency stop button is ideal for point of use or emergency exit locations that are remote from the controller and gas sources.



### Specifications

Mechanical Life:	300,000 operations
Operating Force:	1.8lbs (0.8 kg)
Mounting Adapter:	The adapter is fixed to the mounting surface by means of incorporated screws
Construction:	Polyamide and polycarbonate
Environmental Rating:	IP65; NEMA 4, 13
Relay:	Single pole, single throw, normally closed (NC)
Operating Temperature:	-13°F to 140°F (-25°C to 60°C)

### Ordering Information

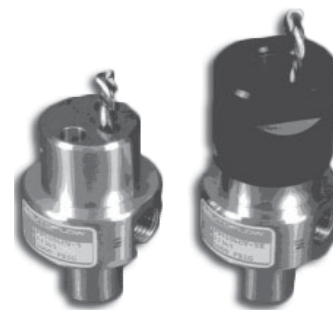
Order No.	Description
585 2001	Emergency shut off button

## 580 Series

excess flow switches

### Description

The 580 Series Excess Flow Switches are designed to precisely detect increasing flow rates of gases in critical processes. When connected to the 585 Series Emergency Shut Off controller, they ensure immediate shutdown of any gas line in the event of a pipeline break or abnormal flow condition. The electrical switch is operated by a high energy permanent magnet. All wetted parts are 316L stainless steel for compatibility with any gas service. They are explosion proof, compact, field adjustable and linear with a wide range of flows and inlet pressures to suit any installation where excess flow shutdown is required.



### Ordering Information

Order No.	End Fittings	Body and Wetted Parts	Max Inlet	Flow Range
580 4001	1/4" FPT x 1/4" FPT	316L stainless steel	3000 PSIG (210 BAR)	1 to 10 lpm (2 SCFH to 20 SCFH)
580 4002	1/4" FPT x 1/4" FPT	316L stainless steel	1000 PSIG (69 BAR)	1 to 120 lpm (2 SCFH to 240 SCFH)
580 4003	1/4" FPT x 1/4" FPT	316L stainless steel	3000 PSIG (210 BAR)	1 to 20 lpm (2 SCFH to 40 SCFH)

welding purge monitor

**Model MK1V**

**Description**

The MK1V purge monitor detects the level of oxygen in purging gas to indicate when the oxygen content is at a satisfactory level to weld. The exact oxygen content is provided, thus preventing the excessive use of purge gas necessary to ensure that the weld will be oxidation free. The monitor readout provides a continuous oxygen level even during welding to detect unforeseen purge problems that can cause low quality welds.

The monitor may also be used as to check confined spaces for safe oxygen levels before personnel enter the area and while they are working.

The MK1V small size and battery operation make is very easy and convenient to use. A sturdy carrying case stores the monitor, a stainless steel probe, a 2 meter length of rubber hose, a vacuum bulb, and a carrying strap.



4

**Specifications**

*Detection range*  
0.01 to 20.9% oxygen

*Accuracy*  
at 20% + 0.2%  
at 2% + 0.02%

*Size*  
5.7" high x 3.15" wide x 1.85" deep

*Power*  
alkaline 9V battery

*Display*  
LCD with 15 mm high digits

*Weight*  
0.5 pounds

dry ice makers

**Series 8800**

**Description**

The Series 800 dry ice makers provide an easy, convenient way to have dry ice in your laboratory whenever you need it. All you need is one of these units and a CO2 cylinder with a full length siphon tube. No batteries or electrical connections are required.

**Model 8874** The transparent polycarbonate body allows viewing of dry ice production and is never as cold as the dry ice, even when filled, allowing safe transport of the unit and contents around the lab. The system operates at very low pressure (displayed on the built-in dial gauge) and incorporates multiple pressure relief safeguards. Six foot transfer line is included.

**Model 8876** Dry ice is contained within a high-density polyethylene chamber that can be safely handled with a gloved hand and used to carry the dry ice block. This rugged unit is made with epoxy coated steel, aluminum and brass and includes a 6' transfer line.

**Model 8886** Ideal for low demand applications or for packing or freezing samples. All components are included to connect to the cylinder to make dry ice flakes as needed. Brass nozzle, fittings and collection bag attach directly to the CO2 cylinder.



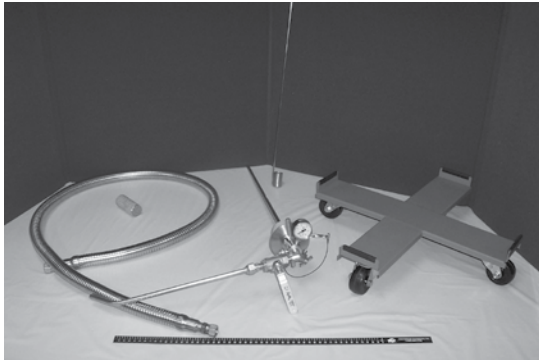
**Ordering Information**

Model	Ice Block Wt. lbs.	Ice Block Size inches	No. of Blocks*
8874	0.5	3-5/16 dia. x 4-3/8 long	10 to 16
8876	1.0	3-5/8 dia. x 4 long	8 to 9
8886	-	ice flakes or snow	-
8886RB		replacement bags 3/package	

\*Yield is based on a 50 lb CO2 cylinder at 70° F. Block yield may be increased by 1/3 if the cylinder is stored at 0° F.

## Accessories

4



- LN2 6' Non -Vacuum Transfer Line
- O2 6' Non - Vacuum Transfer Line
- ¼" Phase Separator
- LN2 Dipper
- Measuring Stick
- Small Roller Base (For use with our 10 & 20 liter tanks)
- Large Roller base (For use with our 35 thru 50 liter tanks)
- Small Withdrawal Device (For use with 10D, 20D, 35D)
- Large Withdrawal Device (For use with our 35DX, 50D)

## Directors

### Director Series Storage Vessels Specifications



Model	D-4000	D-2000C
LN2 Capacity	120 liters	60 liters
Static Hold Time	150 days	83 days
Evaporation Rate (liters/day)	0.80	0.72
<b>Dimensions</b>		
Necktube In.	8.5	8.5
Height In.	38	28
Outside Diameter In.	22	22
<b>Weight</b>		
Empty lb.	71	55
Full lb.	285	163
<b>Racks</b>		
Number	4	4
2 inch high boxes per rack	10	5
Box dimensions In.	5.25 x 5.25	5.25 x 5.25
Ampules per box	100	100
Boxes per vessel	40	20
<b>Capacity</b>		
Ampules in boxes (1.2 or 2.0 ml)	4000	2000

Optional accessories included in picture:

- Rollerbase
- Non-Vac Ln2 Transfer Line
- Model 250 Low-Level Alarm

## Liquid Nitrogen Shipping Vessels



- Increased capacity
- Lightweight
- Backed by more than 100 man years of cryogenic experience
- Convenient specimen loading/ unloading
- Durable exterior finish
- Greater necktube strength

4

Model		IC-2VS	IC-4VS	IC-7VS	IC-20VS
LN2 Capacity		2.4 Liters	4.6 Liters	6.1 Liters	6.3 Liters
Static Hold Time - Days		18	33	27	28
Evap. Rate - liters/ day		.13	.14	.23	.22
<b>Dimensions:</b>					
Necktube -	In	2.25	2.25	3.75	3.75
	mm	57	57	95	95
Outside Dia. -	In	8.75	8.75	11.25	15
	mm	222	222	286	380
Height -	In	16.5	20.6	20.6	30
	mm	419	523	523	762
<b>Weight</b>					
Empty -	lb	8	11	15	30
	kg	3.6	5	6.8	13.6
Full -	lb	12.2	20	26	41
	kg	5.5	9	11.8	18.6
<b>Canisters</b>					
Length -	In	5	11	11	11
	mm	127	279	279	279
Inside Dia -	In	1.75	1.75	2.96	2.96
	mm	44	44	75	75
Number		1	1	1	7
<b>Capacity</b>					
.5 cc Straws on canes		55	120	390	2730
.5 cc Straws bulk		165	300	970	6790
Vials 1.2 ml			36	132	924

Model letters denote type of unit and numbers approximate liter capacity; VS – Vapor Shipper  
Weights are determined without canisters  
Straw capacity based upon: Cane – 10 straws / cane Bulk - two levels in cups and goblets  
Static hold time and evaporation rate are nominal.

**Dewars**



**Dewar Specification Sheet**

Model	IC-3D	IC-5D	IC-6D	IC-10D	IC-20D	IC-35D	IC-35DX	IC-50D
LN2 Capacity	3.6 Liters	5 Liters	6 Liters	10 Liters	20.5 Liters	35 Liters	35 Liters	50 Liters
Hold Time Days	21	23	30	66	100	140	140	125
Evap. Rate liters/ day	.14	.2	.2	.15	.2	.25	.25	.4
<b>Dimensions:</b>								
Necktube								
In	2.25	2.25	2.25	2.25	2.25	2.25	3.75	3.75
mm	57	57	57	57	57	57	95	95
Outside dia.								
In	8.75	8.75	8.75	11.25	15	18.5	18.5	18.5
mm	220	222	222	286	380	470	470	470
Height								
In	16.5	16.3	16.75	23	24.6	25.1	25.1	30.5
mm	419	414	425	584	625	638	638	775
<b>Weight</b>								
Empty								
lb	6.0	6	6.3	12.5	23	31	31	38
kg	3	3	3	5.6	10	14	14	17
Full								
lb	12	15	17	30.3	60	94	94	127
kg	5	7	8	13.6	27	42	42	58

**Refrigerators**



4

Model	IC-3R	IC-6R	IC-10R	IC-20R	IC-20RX	IC-35R	IC-35RX	IC-38RX/6	IC-38RX/10	IC-50RX	ARCTIC 22R	ARCTIC 22RX
LN2 Capacity	3.5 Liters	6 Liters	10 Liters	20 Liters	20 Liters	35 Liters	35 Liters	38 Liters	38 Liters	50 Liters	22 Liters	22 Liters
Hold Time, Days	21	30	100	205	105	291	180	135	135	125	146	146
Evap. Rate - Liters/ day	.13	.2	.10	.10	.19	.12	.19	.28	.28	.4	.15	.15
Work Time - Days/Weeks	13/2	18 / 3	62 / 9	128 / 18	65 / 9	182 / 26	112 / 16	84 / 12	84 / 12	78 / 11	120/16	120 / 16
Dimensions												
Necktube- In	2.25	2.25	2.25	2.25	3.75	2.25	3.75	5.0	5.0	3.75	2.62	2.62
mm	57	57	57	57	95	57	95	127	127	95	66	66
Outside Dia. In	8.75	8.75	11.25	15.0	15.0	19	19	19	19	19	15	15
mm	220	220	286	380	380	483	483	483	483	483	380	380
Height - In	16.5	18.5	23	25	25	25	25	27.6	27.6	30.5	26	26
mm	419	432	584	630	630	630	630	691	691	775	660	660
Weight												
Empty - lb	6.5	7.7	19.5	24	24	29	29	32	32	38	25	25
kg	3	3.5	8.8	10	10	13	13	14.5	14.5	17	11	11
Full - lb	11.5	14	37.3	60	60	90	90	99.7	99.7	127	64	64
kg	5	6	16.9	26	26	40	40	44.9	44.9	58	29	29
Canisters												
Length, In	5	5	11	11	11	11	11	11	11	N/A	11	11
Inside Dia.- In	1.75	1.75	1.75	1.75	2.96	1.75	2.96	4.1	2.96	N/A	2.0	2.0
mm	44	44	44	44	75	44	75	104	75	N/A	51	51
Number	6	6	6	6	6	6	6	6	10	6	3	6
Capacity												
.5 cc Straws on canes	330	330	660	660	2340	660	2340	4680	3900	2340	500	1000
.5 cc Straws Bulk	990	990	1800	1800	5820	1800	5820	10320	9700	5820	1360	2720
Vial 1.2 ml	-	-	216	216	792	216	792	1584	1320	768*	-	-

Straw capacity on canes: 10 Straws / cane for 11" canisters  
5 Straws / cane for 5" canisters

Bulk: Two level goblets for 11"; one level for 5"

Vial capacity on canes: 6 vials / cane

\* with square canisters, 2 1/4 x 2 1/4 x 1 7/8 high box; 8 box / rack (768 - 1/2 x 1/2 x 1 7/8 compartments)



## Series 8636 Whisper Valve®

silenced cryogenic safety relief valve



4

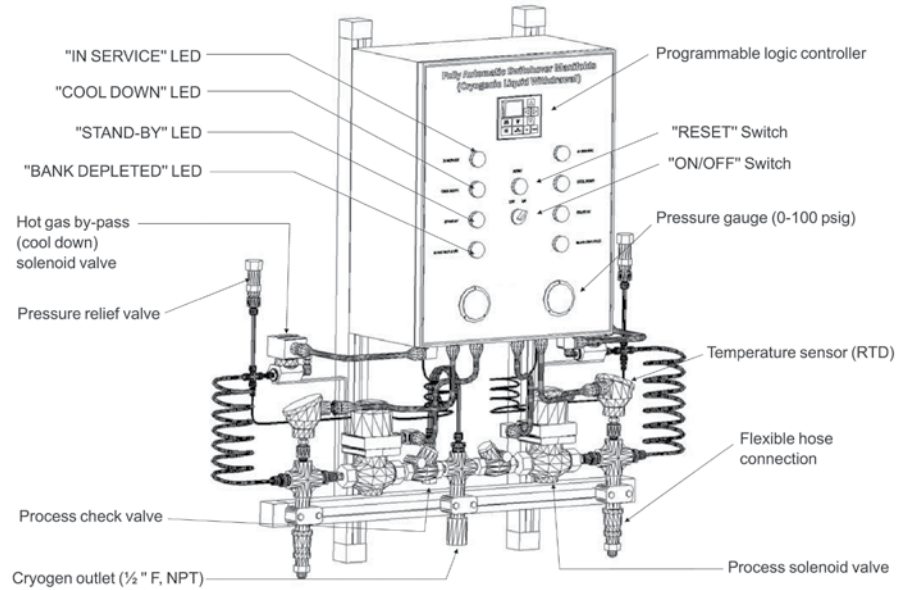
Description	Features
<p>The Whisper Valve is a silenced safety device for use with cryogenic containers.</p> <p>The valve solves the problem of the loud noise, over 100 dB, associated with the activation of the relief valve in cryogenic containers containing nitrogen, argon or carbon dioxide. Many users 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.</p> <p>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 to a noise level of 40-50 dB under normal conditions. For reference the average library noise level is 40 dB.</p> <p>The Whisper Valve also reduces the gas losses of your cryogenic container to average of less than 48 cubic feet over 24 hours.</p> <p>Whisper Valves are available in four settings, 22, 230 psig, 350 psig, and 500 psig. Other settings available on request.</p>	<ul style="list-style-type: none"> <li>• Reduces cryogenic relief valve blow-off noise to 40-50 dB.</li> <li>• Easily installs on any cryogenic argon, oxygen, or nitrogen container.</li> <li>• Available in four ranges to prevent most container noisy blow-offs.</li> <li>• Reduces gas losses to less than 48 cubic feet per 24 hours.</li> <li>• Convenient wall mount kit available.</li> <li>• Standard CGA 295 inlet connection for nitrogen.</li> <li>• CGA 440 inlet connection for oxygen.</li> </ul>

### Ordering Information

Model Number	Description
8636-22	Whisper valve for cryogenic containers with 22 psig relief setting
8636-230	Whisper Valve for cryogenic containers with 230 or 235 psig relief setting
8636-350	Whisper Valve for cryogenic containers with 350 psig relief setting
8636-500	Whisper Valve for cryogenic containers with 500 psig relief setting
8636-KIT	Wall mount bracket, panel mount nut, and six-foot hose with CGA 295
8636-02-22	Whisper valve for cryogenic containers of oxygen with 22 psig relief setting
8636-02-230	Whisper valve for cryogenic containers of oxygen with 230 or 235 psig relief setting
8636-02-350	Whisper valve for cryogenic containers of oxygen with 350 psig relief setting
8636-02-500	Whisper valve for cryogenic containers of oxygen with 500 psig relief setting
8636-02-KIT	Wall mount bracket, panel mount nut, and six-foot hose with CGA 440

fully automatic switchover manifolds for cryogenic liquid supply

**Series CTM75**



4

Description	Features
<p>The CTM75 Cryo Transfer Manifold assures a continuous supply of cryogenic liquid. It is set to transfer from the “in use” empty bank to the “reserve” full bank based on pressure and temperature.</p> <p>This PLC-based system is continuously monitoring the pressure and temperature of both banks. In “read only” mode, the PLC screen indicates actual pressure and temperature of each bank and compares them to their switchover (target) settings. In “programming” mode, the PLC allows you to change the switchover settings.</p> <p>The LEDs indicate the status of each bank at all times.</p>	<ul style="list-style-type: none"> <li>• Continuous cryogenic liquid supply</li> <li>• Automatic switchover from “depleted” bank to “stand-by” bank without operator’s involvement</li> <li>• Built-in “hot gas by-pass” for each manifold side Audible (optional) and visual alarms indicating when a supply side is depleted</li> <li>• Two supply modes: <ul style="list-style-type: none"> <li>- On Demand</li> <li>- Keep full</li> </ul> </li> <li>• Use the entire amount of cryogen in the cylinders</li> <li>• Eliminates downtime due to empty cylinders</li> <li>• Easy field pressure and temperature settings to better meet your application needs</li> </ul>

Ordering Information					
Series	Fluid	Qty. of Cyl. left bank	Qty of cyl right bank	Application	Options
CTM75	Argon = 3	(Max. 2 cylinders)	(Max. 2 cylinders)	Bio Medical = BM Laser = L Industrial = I High Purity = HP	Floor Stand = FS Vacuum insulated flexible hose = VJH Flashing beacon = FB Audible Alarm = AA

Operation Mode Description
<p><b>ON-DEMAND</b></p> <p>The “On Demand” supply mode vents the “hot gas” coming from the liquid cylinders through the cool down solenoid valve before opening the process solenoid valve. The process solenoid valve will open only when receiving an external signal. The same process occurs during the switchover between the depleted “in use” side to the “full reserve” side.</p>
<p><b>KEEP FULL</b></p> <p>The “Keep Full” supply mode assures instant liquid withdrawal whether or not dispensing. The system monitors both pressure and temperature and keeps optimal conditions by opening and closing the cool down solenoid valves. By doing so, quality liquefied gas is maintained up to the process solenoid valves. Thus, the CTM75 will dispense cryogenic liquid within seconds. Because both sides are “kept Full” at all times, the “reserve bank” will immediately supply cryogenic liquid as soon as the “in use” side is depleted. The end use must be aware that the “Keep Full” supply mode will vent product to atmosphere if the demand is low.</p>





# TECHNICAL INFORMATION

 **PurityPlus**<sup>®</sup>  
SPECIALTY GASES

## Section 5 - Technical Information

	Page Number
Gas Safety and Material	
Compatibility Data Chart	5.1
Conversion Factors	5.3
Gases CGA Selection Chart	5.5

## Gas Safety and Material Compatibility Data Chart

This data has been compiled from the best information available and is offered as a guide to proper material selection. The data presented are generalized for average conditions of temperature and pressure. The user should always investigate the characteristics of the gas being handled and take all the proper precautions. Our technical staff will be pleased to give free advice and technical information on any gas or chemical product of interest.

Gas	Hazards for Humans			Materials of Construction								Special Characteristics
	Toxic	Flammable	Corrosive	Aluminum	Copper	Brass	Carbon Steel	Stainless Steel	Monel®	Kel-F®	Teflon®	
Acetylene		◇		S	U	C	S	S		S	S	Do not use at pressures exceeding 15 psig
Air				S	S	S	S	S	S	S	S	
Ammonia	◇	◇	◇	S	U	U	C	S		S	S	Causes stress cracking of copper and copper alloys
Argon				S	S	S	S	S		S	S	
Arsine*	◇	◇		U	S	S	S	S		S	S	Highly toxic, excessive exposure may have delayed effect
Boron Trichloride	◇		◇	U	C	U	S	S	C	S	S	
Boron Trifluoride	◇		◇	U	C	C	S	S	S	S	S	
1-3, Butadiene		◇		S	S	S	S	S		S	S	
Butane		◇		S	S	S	S	S		S	S	
Butenes		◇		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	
Carbonyl Sulfide	◇	◇		S	S	S	S	S		S	S	Poor if moisture present; Treat as Hydrogen Sulfide, affects central nervous system
Chlorine	◇		◇	U	U	U	S	S	C	S	S	Very toxic and damaging to the respiratory system
Cyanogen*	◇	◇		U	U	U	S	S		S	S	Treat as cyanides
Deuterium		◇		S	S	S	S	S		S	S	
Dimethylamine	◇	◇	◇	U	U	U	S	S		S	S	Attacks copper and copper alloys rapidly
Dimethyl Ether		◇		S	S	S	S	S		C	S	
Ethane		◇		S	S	S	S	S		S	S	
Ethyl Chloride	◇	◇		U	C	C	C	C		S	S	
Ethylene		◇		S	S	S	S	S		S	S	
Ethylene Oxide	◇	◇		U	U	U	S	S		S	S	Carcinogen; Exposure of liquid on skin or clothing can cause dermatitis
Fluorine*	◇		◇	S	S	C		S	S	U	C	Strong oxidant, can ignite combustible materials and metals
Helium				S	S	S	S	S		S	S	
Hydrogen		◇		S	S	S	S	S		S	S	
Hydrogen Bromide	◇		◇	U	U	U	C	C	C	S	S	Steel or stainless steel serviceable in dry liquid or gas service
Hydrogen Chloride	◇		◇	U	U	U	C	C	C	S	S	Steel or stainless steel serviceable in dry liquid or gas service
Hydrogen Fluoride*	◇		◇	U	U	U	S	S		S	S	Exposure can attack skin, bones and fingernails
Hydrogen Selenide	◇	◇		U	U	U	S	S		S	S	Extremely toxic, odor deadens the olfactory nerves
Hydrogen Sulfide*	◇	◇		C	U	U	C	S		S	S	Odor deadens olfactory nerves, can cause paralysis
Isobutane		◇		S	S	S	S	S		S	S	
Isobutylene		◇		S	S	S	S	S		S	S	

**Legend**

- ◇ - Primary Hazard
- S - Satisfactory
- U - Unsatisfactory
- C - Conditional use

\*It is recommended that users thoroughly familiarize themselves with the specific properties of this gas.

## Gas Safety and Material Compatibility Data Chart

5

Gas	Hazards for Humans			Materials of Construction								Special Characteristics
	Toxic	Flammable	Corrosive	Aluminum	Copper	Brass	Carbon Steel	Stainless Steel	Monel®	Kel-F®	Teflon®	
Krypton				S	S	S	S	S		S	S	
Methane	◇	◇		S	S	S	S	S		S	S	
Methyl Acetylene		◇		S	U	C	S	S		S	S	
Methyl Bromide	◇	◇		U	U	U	S	S		S	S	Forms explosive compounds with aluminum
Methyl Chloride	◇	◇		U	C	C	S	S		S	S	Forms explosive compounds with aluminum
Methyl Mercaptan	◇	◇		U	U	U	S	S		S	S	
Monoethylamine	◇	◇		U	U	U	S	S		C	S	Attacks copper and copper alloys rapidly
Monomethylamine	◇	◇		U	U	U	S	S		C	S	Attacks copper and copper alloys rapidly
Neon				S	S	S	S	S		S	S	
Nitric Oxide	◇		◇	S	U	U	S	S	U	S	S	Readily reacts with Oxygen to form Nitrogen Dioxide
Nitrogen				S	S	S	S	S		S	S	
Nitrosyl Chloride	◇		◇	U	U	U	U	U	S		S	Very corrosive, attacks most metals except nickel
Nitrous Oxide				C	S	S	S	S		S	S	
Oxygen*				C	S	S	C	C	S	S	S	Strong oxidant, ignites combustible matter spontaneously
Phosgene	◇		◇	U	U	U	C	C		S	S	Very toxic
Phosphine*	◇	◇		S	U	S	S	S		S	S	Highly toxic, high concentrations are pyrophoric
Propane		◇		S	S	S	S	S		S	S	
Propylene		◇		S	S	S	S	S		S	S	
Silane*	◇	◇		S	S	S	S	S		S	S	Pyrophoric
Silicon Tetrafluoride	◇		◇	U	U	U	C	C		S	S	
Sulfur Dioxide	◇		◇	C	U	U	S	S		S	S	
Sulfur Hexafluoride				S	S	S	S	S		S	S	
Sulfur Tetrafluoride	◇		◇	C	S	S	S	S		S	S	
Trimethylamine	◇	◇		U	U	U	S	S		S	S	Attacks copper and copper alloys rapidly
Xenon				S	S	S	S	S		S	S	

\*It is recommended that users thoroughly familiarize themselves with the specific properties of this gas.

All data presented are considered accurate and reliable but supplier assumes no liability or responsibility of any kind.

**Legend**

- ◇ - Primary Hazard
- S - Satisfactory
- U - Unsatisfactory
- C - Conditional use

## Length

	Å	cm	ft	in	m	micron	mm	yd
Multiply By								
Å	-----	$1 \times 10^{-8}$	$3.28 \times 10^{-9}$	$3.93 \times 10^{-9}$	$1 \times 10^{-10}$	$1 \times 10^{-4}$	$1 \times 10^{-7}$	$1.09 \times 10^{-10}$
cm	$1 \times 10^8$	-----	$3.28 \times 10^{-2}$	$3.94 \times 10^{-1}$	$1 \times 10^{-2}$	$1 \times 10^4$	10	$1.09 \times 10^{-2}$
ft	$3.04 \times 10^9$	$3.048 \times 10^1$	-----	$1.2 \times 10^1$	$3.04 \times 10^{-1}$	$3.04 \times 10^5$	$3.04 \times 10^2$	$3.33 \times 10^{-1}$
in	$2.54 \times 10^8$	$2.54 \times 10^0$	$8.33 \times 10^{-2}$	-----	$2.54 \times 10^2$	$2.54 \times 10^4$	$2.54 \times 10^1$	$2.77 \times 10^2$
m	$1 \times 10^{10}$	$1 \times 10^2$	$3.281 \times 10^0$	$3.93 \times 10^1$	-----	$1 \times 10^6$	$1 \times 10^3$	$1.09 \times 10^0$
micron	$1 \times 10^4$	$1 \times 10^{-4}$	$3.28 \times 10^{-6}$	$3.93 \times 10^{-5}$	$1 \times 10^{-6}$	-----	$1 \times 10^{-3}$	$1.09 \times 10^{-6}$
mm	$1 \times 10^7$	$1 \times 10^{-3}$	$3.28 \times 10^{-3}$	$3.93 \times 10^{-2}$	$1 \times 10^{-2}$	$1 \times 10^3$	-----	$1.09 \times 10^{-3}$
yd	$9.14 \times 10^9$	$9.14 \times 10^1$	$3 \times 10^0$	$3.6 \times 10^1$	$9.14 \times 10^{-1}$	$9.14 \times 10^5$	$9.14 \times 10^2$	-----

## Flow

	cm <sup>3</sup> /min	cm <sup>3</sup> /sec	ft <sup>3</sup> /hr	ft <sup>3</sup> /min	m <sup>3</sup> /hr	m <sup>3</sup> /min	L/hr	L/min
Multiply By								
cm <sup>3</sup> /min	-----	$1.66 \times 10^{-2}$	$2.12 \times 10^{-3}$	$3.53 \times 10^{-5}$	$6 \times 10^{-5}$	$1 \times 10^{-6}$	$6.0 \times 10^{-2}$	$1 \times 10^{-2}$
cm <sup>3</sup> /sec	$6 \times 10^1$	-----	$1.27 \times 10^{-1}$	$2.12 \times 10^{-3}$	$3.6 \times 10^{-3}$	$6 \times 10^{-5}$	$3.6 \times 10^0$	$6 \times 10^{-2}$
ft <sup>3</sup> /hr	$4.72 \times 10^2$	$7.87 \times 10^1$	-----	$1.67 \times 10^{-2}$	$2.83 \times 10^{-2}$	$4.72 \times 10^{-4}$	$2.83 \times 10^1$	$4.72 \times 10^{-1}$
ft <sup>3</sup> /min	$2.83 \times 10^4$	$4.72 \times 10^2$	$6.0 \times 10^1$	-----	$1.7 \times 10^1$	$2.83 \times 10^{-2}$	$1.7 \times 10^{-2}$	$2.83 \times 10^1$
m <sup>3</sup> /hr	$1.67 \times 10^4$	$2.78 \times 10^2$	$3.53 \times 10^1$	$5.89 \times 10^{-2}$	-----	$1.67 \times 10^{-2}$	$1 \times 10^3$	$1.67 \times 10^1$
m <sup>3</sup> /min	$1 \times 10^6$	$1.67 \times 10^4$	$2.12 \times 10^3$	$3.53 \times 10^1$	$6.0 \times 10^1$	-----	$6.0 \times 10^4$	$1 \times 10^3$
L/hr	$1.67 \times 10^1$	$2.78 \times 10^{-1}$	$3.53 \times 10^{-2}$	$5.89 \times 10^{-4}$	$1 \times 10^{-3}$	$1.67 \times 10^{-5}$	-----	$1.67 \times 10^{-2}$
L/min	$1 \times 10^3$	$1.67 \times 10^1$	$2.12 \times 10^0$	$3.53 \times 10^{-2}$	$6.0 \times 10^{-2}$	$1 \times 10^{-3}$	$6.0 \times 10^1$	-----

## Pressure

	atm	BAR	Ft of H <sub>2</sub> O	in of Hg	in of H <sub>2</sub> O	kg/cm <sup>2</sup>	kPa	mm of Hg	PSI
Multiply By									
atm	-----	1.013	33.932	29.921	407.183	1.033	101.317	760	14.696
BAR	0.987	-----	33.488	29.530	401.859	1.019	100	750.062	14.504
Ft. of H <sub>2</sub> O	0.029	0.029	-----	0.883	12	0.030	2.989	22.419	0.433
in of Hg	0.033	0.034	1.134	-----	13.6	0.035	3.377	25.4	0.491
in of H <sub>2</sub> O	0.002	0.002	0.083	0.074	-----	0.003	0.025	1.868	0.036
kg/cm <sup>2</sup>	0.968	0.981	32.808	28.959	393.701	-----	98.039	735.559	14.223
kPa	0.009	0.010	0.335	0.296	4.015	0.010	-----	7.501	0.145
mm of Hg	0.001	0.001	0.045	0.039	0.535	0.001	0.133	-----	0.019
PSI	0.06805	0.06895	2.3089	2.0360	27.7085	0.07031	6.89465	51.175	-----



## Weight

	gm	kg	mg	oz	lbs	Ton
Multiply By						
gm	-----	.001	1000	0.035	0.002	$1.1 \times 10^{-6}$
kg	1000	-----	$1 \times 10^6$	$3.53 \times 10^1$	2.205	0.001
mg	0.001	$1 \times 10^{-6}$	-----	$3.53 \times 10^{-4}$	$2.205 \times 10^{-6}$	$1.1 \times 10^{-9}$
oz	$2.83 \times 10^1$	$2.83 \times 10^{-2}$	$2.83 \times 10^4$	-----	$6.25 \times 10^{-2}$	$3.13 \times 10^{-5}$
lbs	$4.54 \times 10^2$	$4.54 \times 10^1$	$4.54 \times 10^5$	16	-----	$5.0 \times 10^{-4}$
Ton	$9.07 \times 10^5$	$9.07 \times 10^2$	$9.07 \times 10^8$	$3.2 \times 10^4$	$2.0 \times 10^3$	-----

## Volume

	cm <sup>3</sup> (ml)	ft <sup>3</sup>	in <sup>3</sup>	m <sup>3</sup>	US gal.	L
Multiply By						
cm <sup>3</sup> (ml)	-----	$3.53 \times 10^{-5}$	$6.10 \times 10^{-2}$	$1 \times 10^{-6}$	$2.56 \times 10^{-3}$	$1 \times 10^{-3}$
ft <sup>3</sup>	$2.83 \times 10^4$	-----	$1.73 \times 10^3$	$2.83 \times 10^{-2}$	7.48	2.83
in <sup>3</sup>	1.64	$5.79 \times 10^{-6}$	-----	$1.64 \times 10^{-5}$	$4.33 \times 10^{-3}$	$1.64 \times 10^{-2}$
m <sup>3</sup>	$1 \times 10^6$	3.53	$6.10 \times 10^4$	-----	$2.64 \times 10^2$	$1 \times 10^3$
US gal.	$3.79 \times 10^3$	$1.34 \times 10^{-1}$	$2.31 \times 10^2$	$3.79 \times 10^{-3}$	-----	3.79
L	$1 \times 10^3$	$3.54 \times 10^{-1}$	$6.10 \times 10^1$	$1 \times 10^{-3}$	$2.64 \times 10^{-1}$	-----

## Concentration

Concentration	Equivalent
1,000,000 ppm	100%
100,000 ppm	10%
10,000 ppm	1%
1,000 ppm	0.1%
100 ppm	0.01%
10 ppm	0.001%
1 ppm	0.0001%
1,000 ppb	1 ppm
100 ppb	0.1 ppm
10 ppb	0.001 ppm

## Temperature

	°C	°F	°K	°R
Multiply By				
°C + 17.78	-----	1.8	-----	-----
°C + 273.16	-----	-----	1	-----
°F - 32	0.55556	-----	-----	-----
°F + 459.72	-----	-----	-----	1
°K + 273.16	1	-----	-----	-----
°R - 459.72	-----	1	-----	-----

## Physical Constants

	Value	Units
Avagadro's Number	$6.022 \times 10^{23}$	molecules/gm-mole
Gas Law Constant	1.98719	cal/(gm-mol)(°K)
	1.98719	Btu/(lbs-mole)(°R)
	82.0568	(cm <sup>3</sup> )(atm)/(gm-mole)(°K)
	0.0820568	(L)(atm)/(gm-mole)(°K)
	10.7314	(ft <sup>3</sup> )(lb)/(in <sup>2</sup> )(lbs-mole)(°R)
	0.730228	(ft <sup>3</sup> )(atm)/(lbs-mole)(°R)

## Density

	gms/cm <sup>3</sup>	kg/cm <sup>3</sup>	lbs/ft <sup>3</sup>	lbs/in <sup>3</sup>	lbs/US gal.
Multiply By					
gms/cm <sup>3</sup>	-----	1000	$6.24 \times 10^1$	$3.61 \times 10^{-2}$	8.35
kg/cm <sup>3</sup>	$1 \times 10^{-3}$	-----	$6.24 \times 10^{-2}$	$3.61 \times 10^{-3}$	$8.35 \times 10^{-3}$
lbs/ft <sup>3</sup>	$1.60 \times 10^{-2}$	$1.60 \times 10^1$	-----	$3.61 \times 10^{-5}$	$1.33 \times 10^{-1}$
lbs/in <sup>3</sup>	$2.77 \times 10^1$	$2.77 \times 10^4$	$1.73 \times 10^3$	-----	$2.31 \times 10^2$
lbs/US gal.	$1.2 \times 10^{-1}$	$1.2 \times 10^2$	7.48	$4.33 \times 10^{-3}$	-----

## Scientific Notation

Notation	Equivalent	Notation	Equivalent
$1 \times 10^{10}$	10,000,000,000	$1 \times 10^{-1}$	0.1
$1 \times 10^9$	1,000,000,000	$1 \times 10^{-2}$	0.01
$1 \times 10^8$	100,000,000	$1 \times 10^{-3}$	0.001
$1 \times 10^7$	10,000,000	$1 \times 10^{-4}$	0.0001
$1 \times 10^6$	1,000,000	$1 \times 10^{-5}$	0.00001
$1 \times 10^5$	100,000	$1 \times 10^{-6}$	0.000001
$1 \times 10^4$	10,000	$1 \times 10^{-7}$	0.0000001
$1 \times 10^3$	1,000	$1 \times 10^{-8}$	0.00000001
$1 \times 10^2$	100	$1 \times 10^{-9}$	0.000000001
$1 \times 10^1$	10	$1 \times 10^{-10}$	0.0000000001

## PURE GASES CGA SELECTION CHART FOR FITTINGS

CGA Fittings Required	Pure Gases
510/300	Acetylene
590/346/347/702	Air
240/660/705	Ammonia
580/680/677	Argon
350	Arsine*
320	Carbon Dioxide
350	Carbon Monoxide
660	Chlorine
510	Cyclopropane
350	Deuterium
350	Ethane
350	Ethylene
510	Ethylene Oxide
580/680/677	Helium
350/695/703	Hydrogen
330	Hydrogen Chloride
330	Hydrogen Sulfide
580	Krypton
350/695/703	Methane
510	Methyl Chloride
580/680/677	Neon
580/680/677	Nitrogen
326	Nitrous Oxide
540/577/701	Oxygen*
350	Phosphine
510	Propane
350	Silane*
668/660	Sulfur Dioxide
590	Sulfur Hexafluoride
580/680/677	Xenon

## MIXED GASES CGA SELECTION CHART FOR FITTINGS

CGA Fittings Required	Mixed Gases	
	Minor Component	in Major Component
240/660/705	Ammonia	Nitrogen
350	Butane	Nitrogen
296	Carbon Dioxide	Oxygen
580	Carbon Dioxide	Helium or Nitrogen
580	Carbon Dioxide and/or Nitrogen	Helium
590	Carbon Monoxide	Air
330	Chlorine	Nitrogen
350	Diborane	Argon, Helium, Hydrogen, Nitrogen
580	Freon-12	Nitrogen
296	Helium	Oxygen
350	Hexane	Nitrogen
350	Isobutane	Nitrogen
580	Krypton	Argon
590	Methane	Air
580	Moisture	Argon, Helium or Nitrogen
660	Nitric Oxide	Nitrogen
660	Nitrogen Dioxide	Air or Nitrogen
590	Nitrous Oxide	Nitrogen
590	Oxygen	Nitrogen or Helium
350	Propane	Nitrogen or Helium
590	Propane	Air
660	Sulfur Dioxide	Air or Nitrogen
590	Sulfur Hexafluoride	Argon, Helium or Nitrogen
350	Sulfur Hexafluoride	Hydrogen

It is recommended that the user thoroughly familiarize himself with the specific properties of these gases.

The Compressed Gas Association (CGA) has selected and standardized the valve outlet to be used on each gas cylinder. These standards, contained in the document "CGA STANDARD V-1, Compressed Gas Cylinder Valve Outlet Connections", have been adopted to prevent the inadvertent mixing of gases which could be reactive and to avoid other possible misuse hazards.

The above chart may be used for guide purposes only. Consult your gas supplier to determine the actual CGA connection required when ordering a regulator.

Since the combined characteristics of a mixture of gases often differ from the properties of the separate components, different CGA connections are often required. The CGA has selected and standardized the valve outlets to be used with mixed gases. These standards are described in CGA publication V-7 - "Standard Method for Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures".

Mixtures which use the same CGA connection as if the minor component were in its pure gas form have not been included for the sake of brevity. The proper fitting for these mixtures can be determined by looking up the minor component on the chart for pure gases.

### Notes:

Lined area for taking notes, consisting of 20 horizontal lines.

5



# GLOSSARY

## Section 6 - Glossary

	Page Number
Glossary	6.1 - 6.2

**Absolute Pressure** – The total pressure exerted on a system, equal to the gauge pressure plus atmospheric pressure. Absolute pressure is designated as PSIA. Often pressure measurements utilize a gauge to record the difference between the system and the atmospheric pressure. This is called gauge pressure and is designated as PSIG.

**Atmospheric Pressure** – The pressure exerted by the weight of the atmosphere at sea level, equal to 14.696 PSI or 0.98692 Bar.

**Absolute Zero** – The zero point of the ideal gas temperature scale designated as 0° Kelvin, -273.15° Celsius, and -459.67° Fahrenheit.

**Absorption** – Physical or chemical process in which the atoms or molecules of a material penetrate into another material. The atoms or molecules are taken up by the volume in the material, not the surface.

**Adsorption** – Adhesion of the atoms or molecules of a material to the surface of another material (called an adsorbent). Usually a gas, a liquid or a dissolved substance will adhere to the surfaces of a solid.

**Anhydrous** – The general term describing a material that does not contain any water molecules.

**Atomic Weight** – Ratio of the average mass of a chemical element's atoms to carbon-12. The standard atomic weight of a naturally occurring element is the ratio of the weighted average of all of the naturally occurring isotopes to carbon-12, expressed in atomic mass units.

**Atomic Mass Unit** – 1/12th the mass of carbon 12.

**Asphyxiant Gas** – Non-toxic gas that can displace the oxygen containing atmosphere, resulting in unconsciousness and death.

**ACGIH – American Conference of Government Industrial Hygienists** – Professional Society devoted to the advancement of occupational and environmental health.

**Boiling Point** – Temperature at which the pressure of a liquid is equal to the pressure exerted by the surrounding atmosphere. See Normal Boiling Point.

**BTU – British Thermal Unit** – The quantity of heat required to raise the temperature of one pound of water 1° F.

**Calibration Gas** – A gas or gas mixture of accurately known composition used as a comparative standard.

**Calorie** – The amount of heat required to raise the temperature of one gram of water 1° C.

**Catalyst** – A substance that reduces the activation energy of a chemical reaction. Catalysts participate in reactions, but are not consumed by the reaction.

**CGA – Compressed Gas Association** – Professional Organization dedicated to the development and promotion of Safety Standards and Safe Practices in the Industrial Gas Industry.

**CAS – Chemical Abstract Services** – A division of the American Chemical Society (ACS) that provides comprehensive databases of publicly disclosed research in chemistry and related sciences, including the world's largest collection of substance information, the CAS RegistrySM.

**Compressed Gas** – Any Material or mixture with a pressure exceeding 40 PSIA at 70° F or having an absolute pressure exceeding 104 PSIA at 130° F or any flammable liquid having a vapor pressure exceeding 40 PSI at 100° F.

**Corrosive** – A Chemical compound which visibly destroys or irreversibly damages living tissue or chemically attacks and eats away rubber, metal, or other substances.

**Critical Temperature** – The lowest temperature at which a gas cannot be liquefied, no matter how much pressure is applied. At this temperature, the liquid and gas have the same density.

**Critical Pressure** – The pressure required to liquefy a gas at its critical temperature.

**Cryogenic Liquid** – A liquid with a boiling point below -60° C.

**Density** – The ration of the mass of a substance to its volume.

**DOT – Department of Transportation** – Government agency whose purview is to regulate the transportation of hazardous materials.

**Dew Point** – The temperature at which water vapor begins to condense into liquid water.

**EPA – Environmental Protection Agency** – Government agency established in 1970 for the establishment and enforcement of environmental protection standards.

**Fill Density** – The percent ratio of the weight of a liquefied gas in a container to the weight of the water that the container will hold at 68° F.

**Flammable Limits** – The concentration of a flammable vapor in air at normal atmospheric pressure and temperature that will propagate a flame upon contact with an ignition source. See LEL, UEL.

**Flash Point** – The lowest temperature at which a liquid gives off enough vapor to form a flammable mixture with air.

**Inert Gas** – A gas which does not react with other materials at NTP.

**Liquefied Compressed Gas** – A gas that can be liquefied in a container with increased pressure at normal temperature.

**LEL – Lower Explosive Limit** – The maximum concentration of a specific flammable vapor in air at NTP that will propagate a flame upon contact with an ignition source. Concentrations below this level will not propagate a flame upon contact with an ignition source.

**Mole** – The mass in grams of a substance that is equal to the molecular weight the substance. Also called gram molecular weight.

**Molecular Weight** – The sum of the atomic weights of all atoms in a molecule.

**Normal Boiling Point** – The temperature at which the vapor pressure of a liquid equals 1 atmosphere (14.696 PSIA).

**NTP – Normal Temperature and Pressure** – 20° C and 760 torr.

**OSHA – Occupational Safety and Health Administration** – An agency of the Department of Labor whose mission is to prevent work related injuries and illnesses by issuing and enforcing standards for workplace safety and health.

**Oxidizer** – Substance that causes or contributes to the combustion of another material. An oxidizer is not necessarily combustible in itself.

**PPM – Parts Per Million** – Notation for specifying precise amounts of very low concentrations of chemical elements or compounds. For gases, denotes the number of molecules of a gas or gas mixture found in every 1 million molecules of the gas of gas mixture.

**Specific Gravity** – The ration of the weight of a given volume of a substance to the weight of an equal volume of a reference material. Liquids and solids are normally compared to water (sp. gr. of H<sub>2</sub>O = 1), while gases are normally compared to air (sp. gr. of air = 1).

**Specific Heat** – The amount of heat required to change the temperature of a unit of mass (or a quantity, such as a mole) of a substance one degree at either constant pressure (CV) or constant temperature (CP).

**Specific Volume** – The volume occupied by a unit mass of a material at a given temperature. The specific volume of a gas is normally expressed as cubic feet of volume per pound of gas.

**STP - Standard Temperature and Pressure** – 0° C at 760 Torr.

**Torr** – Common unit of measure for vapor pressure. 1 Torr = 1 mm of mercury.

**Toxic Gas** – A gas that has an LC50 in air of 200 PPM or less. Even low concentrations of a gas may cause injury or death.

**UEL – Upper Explosive Limit** – The maximum concentration of a specific flammable vapor in air at NTP which will propagate a flame upon contact with an ignition source. Concentrations above this level will not propagate a flame upon contact with an ignition source.

**Vapor Pressure** – The pressure exerted by a vapor in equilibrium with its liquid or solid phase at a given temperature. The vapor pressure of gases is normally measured at 70° F.