Specialty Gases + World-Class Performance

PurityPlus™ Specialty Gases

Specialty Gases & Equipment Catalog

PurityPlus™ Specialty Gases

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PurityPlus™ Specialty Gases

Acetylene

A colorless, highly flammable gas.

Technical Information:	
Chemical Symbol:	C_2H_2
Molecular Weight:	26.04
Specific Volume	14.7 ft^3/lb (0.91 m^3/kg)
CAS Registry Number:	74-86-2

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus Purified 2.6	99.6%	Oxygen plus CH_4 PH_3	4000 ppm 20 ppm	200 series regulators
PurityPlus Atomic Absorption 2.6	99.6%			200 series regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
380	330	250	510	
140	130	250	510	

*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable gas.

Air

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

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus Ultra Zero		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 regulators
PurityPlus Zero		Total Hydrocarbons Oxygen	1 ppm 19.5% to 23.5%	300 series regulators
PurityPlus Extra Dry		Water Oxygen	8 ppm 19.5% to 21.5%	200 series regulators
CEM				
Vehical Em.				

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	311	2640	590	
200	233	2200	590	
80	78	2200	590	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Ammonia

A colorless, pungent, toxic gas.

Technical Information:	
Chemical Symbol:	NH_3
Molecular Weight:	17.03
Specific Volume	22.6 ft^3/lb (1.41 m^3/kg)
CAS Registry Number:	7664-41-7

Shipping Information:	
DOT/TC Proper Name:	Ammonia, Anhydrous
Hazard Class:	2.3
I.D. Number:	UN 1005
Labels:	Poison Gas, Corrosive

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus VLSI (liquid phase)	99.995	Oil Water	< 0.5 ppm < 3 ppm	400 series stainless steel regulators
PurityPlus 4.0 (liquid phase)	99.9			400 series stainless steel regulators
PurityPlus 2.5 (liquid phase)	99.5		> 99.5%	400 series stainless steel regulators

Standard Cylinder Sizes *	Contents lb	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
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

A chemically inert, colorless, odorless, nontoxic gas.

Argon

Technical Information:	
Chemical Symbol:	Ar
Molecular Weight:	39.948
Specific Volume	9.7 ft^3/lb
CAS Registry Number:	7440-37-1

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 6.0	99.9999%	Oxygen Moisture Nitrogen Total Hydrocarbons CO/CO_2	0.15 ppm 0.15 ppm 0.40 ppm 0.10 ppm 0.10 ppm	400 series regulators
PurityPlus 5.0	99.999%	Oxygen Moisture Total Hydrocarbons	2 ppm 2 ppm 0.5 ppm	300 series brass regulators
PurityPlus N_2 Free 5.0	99.999%	Oxygen Moisture Nitrogen Total Hydrocarbons	2 ppm 2 ppm 5 ppm 0.5 ppm	300 series brass regulators
PurityPlus 4.8	99.998%	Oxygen Moisture Total Hydrocarbons	5 ppm 2 ppm 5 ppm	300 series brass regulators
PurityPlus Zero 4.8	99.998%	Total Hydrocarbons	0.5 ppm	300 series brass regulators
PurityPlus 4.8 (6000 PSIG)	99.998%	Oxygen Moisture	10 ppm 3 ppm	492 series regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	337 / 9.37	2640	580	
200	250 / 6.79	2200	580	
80	83 / 2.3	2200	580	
6K	575 / 15.94	6000	677	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Carbon Dioxide

A colorless, odorless, nonflammable slightly acidic gas.

Technical Information:	
Chemical Symbol:	CO_2
Molecular Weight:	44.04
Specific Volume	8.76 ft^3/lb (0.55 m^3/kg)
CAS Registry Number:	124-38-9

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus Laser 4.5	99.995%	Moisture Oxygen Total Hydrocarbons	5 ppm 5 ppm 1 ppm	400 series brass regulators
PurityPlus Coleman 4.0	99.99%	Moisture Oxygen Total Hydrocarbons	10 ppm 20 ppm 50 ppm	300 series regulators
PurityPlus Anaerobic 3.0	99.9%	Oxygen	20 ppm	200 series regulators
PurityPlus 2.8	99.8%	Moisture	20 ppm	200 series regulators

Standard Cylinder Sizes *	Contents lb	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	50	838	320	
80	20	838	320	

*Nonstandard cylinder sizes available upon request

A colorless, odorless, toxic, flammable gas.

Carbon Monoxide

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

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 4.0	99.99%	Nitrogen Oxygen Carbon Dioxide Hydrogen Total Hydrocarbons Water	< 10 ppm < 2 ppm < 20 ppm < 10 ppm < 5 ppm < 5 ppm	300 series stainless steel regulators
PurityPlus 2.5	99.5%	Carbon Monoxide	> 99.5%	300 series regulators
PurityPlus 2.0	99.0%	Carbon Monoxide	> 99.0%	

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
150A	148	1660	350	
80A	78	1660	350	
33A	34	1660	350	
300	236	2000		
200	175	1660		

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Carbonyl Sulfide

A colorless with an unpleasant smell.

Technical Information:	
Chemical Symbol:	COS
Molecular Weight:	60.7
Specific Volume	2.1
CAS Registry Number:	463-58-1

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 3.0		Oxygen Nitrogen Water Carbon Dioxide Hydrogen Sulfide	< 0.01% < 0.03% < 0.01% < 0.03% < 0.01%	400 series stainless steel regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	44		330	
80	16		330	
33	7		330	

*Nonstandard cylinder sizes available upon request

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

Chlorine

Technical Information:	
Chemical Symbol:	Cl_2
Molecular Weight:	70.91
Specific Volume	5.4 ft^3/lb (0.33 m^3/kg)
CAS Registry Number:	7782-50-5

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 4.0	99.99%			
PurityPlus 3.0 (liquid phase)	99.9%	Chlorine	> 99.9%	400 series stainless steel regulators 455 series regulators
PurityPlus 2.5	99.5%	Chlorine	> 99.5%	400 series stainless steel regulators 455 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
400	150	85	660	
200	100	85	660	
80	40	85	660	
30	15	85	660	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Deuterium

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

Technical Information:	
Chemical Symbol:	D_2
Molecular Weight:	4.03
Specific Volume	95.9 ft^3/lb (5.95 m^3/kg)
CAS Registry Number:	7782-39-0

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Hydrogen Oxygen Nitrogen Water Deuterium Hydride Total Hydrocarbons Carbon Monoxide Carbon Dioxide	< 100 ppm < 1 ppm < 1 ppm < 1 ppm < 3000 ppm < 1 ppm < 1 ppm < 1 ppm	400 series brass regulators
PurityPlus 4.0	99.99%	Deuterium	> 99.99%	300 series brass regulators
PurityPlus 2.7	99.7%	Deuterium	> 99.7%	200 series regulators

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	5000	1760	350	
80	1000	890	350	
30	500	1090	350	

*Nonstandard cylinder sizes available upon request

A brownish, toxic, corrosive, liquefied gas. **Dinitrogen Tetroxide** (Nitrogen Dioxide)

Technical Information:	
Chemical Symbol:	NO_2
Molecular Weight:	46.01
Specific Volume	4.7 ft^3/lb (0.29 m^3/kg)
CAS Registry Number:	10102-44-0

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 2.5 (liquid phase)	99.5%	Moisture Particle (Metal Residue)	< 0.15% < 10 mg/L	400 series stainless steel regulators

Standard Cylinder Sizes *	Contents lb	Cylinder Pressure PSIA	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	120	15	660	
35	10	15	660	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Ethane

A colorless, odorless, flammable gas.

Technical Information:	
Chemical Symbol:	C_2H_6
Molecular Weight:	30.07
Specific Volume	12.80 ft^3/lb (0.79 m^3/kg)
CAS Registry Number:	74-84-0

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 2.0	99%	Ethane	> 99.0%	200 series regulators
PurityPlus 4.0	99.99%			300 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	34	544	350	
80	11	544	350	
30	4	544	350	

*Nonstandard cylinder sizes available upon request

A colorless, flammable gas with a sweet odor.

Ethylene

Technical Information:	
Chemical Symbol:	C_2H_4
Molecular Weight:	28.05
Specific Volume	13.70 ft^3/lb (0.86 m^3/kg)
CAS Registry Number:	74-85-1

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 4.0	99.99%	Ethane Total Impurities	< 100 ppm < 100 ppm	300 series brass regulators
PurityPlus 3.0	99.9%	Ethane Total Impurities	< 0.1% < 0.1%	200 series regulators
PurityPlus 2.0	99%	Ethane Total Impurities	< 0.5% < 0.5%	200 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	37	1600	350	
200	30	1200	350	
80	10	1200	350	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Helium

A colorless, odorless, tasteless, inert gas.

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

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 6.0	99.9999%	Oxygen Moisture Nitrogen Total Hydrocarbons Carbon Monoxide Carbon Dioxide Total of all impurities	0.5 ppm 1 ppm 1 ppm 0.2 ppm 0.1 ppm 0.1 ppm 1 ppm	400 series regulators
PurityPlus 5.0	99.999%	Oxygen Moisture Total Hydrocarbons	1 ppm 2 ppm 0.5 ppm	300 series brass regulators
PurityPlus Zero 4.8	99.998%	Total Hydrocarbons	0.5 ppm	300 series brass regulators
PurityPlus 4.7	99.997%	Oxygen Moisture	5 ppm 5 ppm	300 series brass regulators
PurityPlus 4.7 (6000 PSIG)	99.997%	Oxygen Moisture	5 ppm 5 ppm	492 series regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	291	2640	580	
200	217	2200	580	
80	73	2200	580	
6K	515	6000	677	

*Nonstandard cylinder sizes available upon request

A colorless, odorless, nonflammable gas.

Hexafluoropropylene

Technical Information:	
Chemical Symbol:	C_3F_6
Molecular Weight:	150.03
Specific Volume	2.58 ft^3/lb (0.161 m^3/kg)
CAS Registry Number:	116-15-4

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 3.0	99.9%	Saturated Hydrocarbons Unsaturated Hydrocarbons Oxygen Acidity	< 0.2 ppm < 0.3 ppm < 50 ppm < 0.0001%	200 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
1J	125	85	660	
2L	30	85	660	
3L	14	85	660	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Hydrogen

A colorless, odorless, flammable gas.

Technical Information:	
Chemical Symbol:	H_2
Molecular Weight:	2.02
Specific Volume	192 ft^3/lb (11.9 m^3/kg)
CAS Registry Number:	1333-74-0

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Moisture Oxygen Nitrogen Total Hydrocarbons	3 ppm 1 ppm 5 ppm 1 ppm	300 series brass regulators
PurityPlus 4.8 (6000 PSIG)	99.998%	Moisture Oxygen	3 ppm 5 ppm	493 series regulators
PurityPlus Zero 4.5	99.995%	Total Hydrocarbons	0.5 ppm	300 series brass regulators
PurityPlus 4.0	99.99%	Moisture Oxygen	10 ppm 20 ppm	300 series brass regulators
Research Grade				400 series brass regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	261	2400	350	
200	195	2000	350	
80	71	2000	350	
6K	483	6000	703	

*Nonstandard cylinder sizes available upon request

A colorless, corrosive, irritating, toxic gas.

Hydrogen Chloride

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

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0 (liquid phase)	99.999%	Nitrogen Oxygen CO/CO_2 Total Hydrocarbons		400 series stainless steel regulators 455 series regulators
PurityPlus 4.0 (liquid phase)	99.99%	Hydrogen Chloride	> 99.99%	400 series stainless steel regulators 455 series regulators
PurityPlus 2.0 (liquid phase)	99%	Hydrogen Chloride	> 99.99%	400 series stainless steel regulators 455 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	60	613	330	
80	20	613	330	
30	8	613	330	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Hydrogen Sulfide

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

Technical Information:	
Chemical Symbol:	H_2S
Molecular Weight:	34.08
Specific Volume	11.2 ft^3/lb (0.69 m^3/kg)
CAS Registry Number:	7783-06-4

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 2.5 (liquid phase)	99.5%	Hydrogen Sulfide	> 99.5%	400 series stainless steel regulators 408 series regulators
PurityPlus 2.0	99.0%	Hydrogen Sulfide	> 99.0%	

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
400	170	252	330	
200	60	252	330	
80	20	252	330	

*Nonstandard cylinder sizes available upon request

A colorless, flammable gas.

Isobutane

Technical Information:	
Chemical Symbol:	C_4H_{10}
Molecular Weight:	58.12
Specific Volume	6.5 ft^3/lb (0.40 m^3/kg)
CAS Registry Number:	75-28-5

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 2.5 (liquid phase)	99.5%	Isobutane	> 99.5%	200 series regulators
PurityPlus 2.0 (liquid phase)	99%	Isobutane	> 99%	200 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
350	116	31	510	
LP20	20	31	510	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Krypton

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

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

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Nitrogen Oxygen Hydrogen CO/CO_2 Tetrafluoromethane Total Hydrocarbons Water Xenon		300 series brass regulators
PurityPlus 4.0	99.99%	Nitrogen Oxygen Hydrogen CO/CO_2 Tetrafluoromethane Total Hydrocarbons Water Xenon	< 10 ppm < 2 ppm < 1 ppm < 1 ppm < 1 ppm < 1 ppm < 1 ppm < 20 ppm	300 series brass regulators
PurityPlus 2.0	99%	Krypton	> 99%	300 series regulators

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	10,000	2100	580	
200	5000	1400	580	
80	2500	1700	580	
LB	100	760	580/110	

*Nonstandard cylinder sizes available upon request

A colorless, odorless, tasteless, flammable gas.

Methane

Technical Information:	
Chemical Symbol:	CH_4
Molecular Weight:	16.04
Specific Volume	23.7 ft^3/lb (1.47 m^3/kg)
CAS Registry Number:	74-82-8

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Methane	> 99.999%	300 series brass regulators
PurityPlus 4.0	99.99%	Methane	> 99.99%	300 series brass regulators
PurityPlus 2.0	99%	Methane	> 99%	200 series regulators
PurityPlus 1.3	93%	Methane	> 93%	200 series regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	356	2400	350	
200	260	2000	350	
80	88	2000	350	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Neon

A colorless, odorless, nonflammable, inert gas.

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

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Helium Nitrogen Oxygen Water Hydrogen Total Hydrocarbons	799.999%	300 series brass regulators

Standard Cylinder Sizes *	Contents liters	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	7500	2400	580	
200	6000	2200	580	
80	2000	1775	580	
LB	100	770	580/110	

*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^3/lb (0.80 m^3/kg)
CAS Registry Number:	10102-43-9

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 3.0	99.9%	Nitric Oxide	> 99.9%	400 series stainless steel regulators
PurityPlus 2.0	99%	Nitric Oxide	> 99%	400 series stainless steel regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	53	500	660	
80	19	500	660	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Nitrogen

A colorless, odorless, chemically inert gas.

Technical Information:	
Chemical Symbol:	N_2
Molecular Weight:	28.01
Specific Volume	13.8 ft^3/lb (0.86 m^3/kg)
CAS Registry Number:	7727-37-9

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 6.0	99.9999%	Oxygen Moisture Total Hydrocarbons CO/CO_2	0.15 ppm 0.15 ppm 0.10 ppm 0.10 ppm	400 series stainless steel regulators
PurityPlus 5.0	99.999%	Oxygen Moisture Total Hydrocarbons	1 ppm 3 ppm 0.5 ppm	300 series brass regulators
PurityPlus Zero 4.8	99.998%	Total Hydrocarbons	0.5 ppm	300 series brass regulators
PurityPlus O_2 Free 4.8	99.998%	Oxygen	0.5 ppm	300 series brass regulators
PurityPlus 4.8	99.998%	Oxygen Moisture	5 ppm 5 ppm	492 series regulators
PurityPlus 4.8 (3500 or 6000 PSIG)	99.995%	Oxygen Water Total Hydrocarbons CO/CO_2 Hydrogen	0.5 ppm 1 ppm 0.1 ppm 2 ppm 1 ppm	300 series brass regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	304	2640	580	
200	228	2200	580	
80	76	2200	580	
6K	494	6000	677	

*Nonstandard cylinder sizes available upon request

A toxic, colorless, odorless, nonflammable gas.

Nitrogen Trifluoride

Technical Information:	
Chemical Symbol:	NF_3
Molecular Weight:	71.00
Specific Volume	5.043 ft^3/lb (0.337 m^3/kg)
CAS Registry Number:	7783-54-2

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 4.0	99.99%	Oxygen/Argon Nitrogen Tetrafluoromethane Carbon Dioxide Nitrous Oxide Sulfur Hexafluoride Water 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	400 series brass regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	44	1450	330	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Nitrous Oxide

A colorless, sweet-tasting, oxidizing gas.

Technical Information:	
Chemical Symbol:	N_2O
Molecular Weight:	44.01
Specific Volume	8.7 ft^3/lb (0.54 m^3/kg)
CAS Registry Number:	10024-97-2

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus VLSI (liquid phase)	5.0	Nitrogen Oxygen Carbon Dioxide Total Hydrocarbons Water 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 regulators 308 series regulators
PurityPlus 4.5	99.995%	Oxygen Moisture Nitrogen Total Hydrocarbons CO/CO_2	5 ppm 5 ppm 20 ppm 5 ppm 5 ppm	300 series brass regulators 308 series regulators
PurityPlus 3.0	99.9%	Nitrogen Oxygen Carbon Dioxide Total Hydrocarbons Water Carbon Monoxide	< 400 ppm < 100 ppm < 250 ppm < 30 ppm < 50 ppm < 50 ppm	200 series brass regulators 308 series regulators
CP 2.6 **PurityPlus AA 2.6**	99.6%	Moisture O_2/N_2	30 ppm 2000 ppm	308 series regulators

Standard Cylinder Sizes *	Contents lb	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	60	745	326	

*Nonstandard cylinder sizes available upon request

A colorless, relatively non-reactive gas.

Octafluoropropane (HC-218)

Technical Information:	
Chemical Symbol:	C_3F_8
Molecular Weight:	188.0
Specific Volume	2.02 ft^3/lb (0.126 m^3/kg)
CAS Registry Number:	76-19-7

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Organic Impurities Water Carbon Monoxide Carbon Dioxide Nitrogen/Oxygen Acidity (as HF)	< 10 ppm	300 series brass regulators
PurityPlus 3.0	99.9%	Octafluoropropane	> 99.9%	200 series regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	95	25	660	
80	20			

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Oxygen

A colorless, odorless, tasteless, highly oxidizing gas.

Technical Information:	
Chemical Symbol:	O_2
Molecular Weight:	32
Specific Volume	12.1 ft^3/lb (0.76 m^3/kg)
CAS Registry Number:	7782-44-7

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Argon Moisture Nitrogen Total Hydrocarbons CO/CO_2	5 ppm 2 ppm 5 ppm 1 ppm 1 ppm	300 series brass regulators
PurityPlus 4.3	99.993%	Argon Moisture Nitrogen Total Hydrocarbons	40 ppm 3 ppm 10 ppm 0.5 ppm	300 series brass regulators
PurityPlus Zero 2.8	99.8%	Total Hydrocarbons	0.5 ppm	300 series regulators
PurityPlus Extra Dry 2.6	99.6%	Moisture	10 ppm	200 series regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
300	337	2640	540	
200	249	2200	540	
80	83	2200	540	

*Nonstandard cylinder sizes available upon request

A colorless, odorless, liquefied gas.

Sulfur Hexafluoride

Technical Information:	
Chemical Symbol:	SF_6
Molecular Weight:	146.05
Specific Volume	2.50 ft^3/lb (0.16 m^3/kg)
CAS Registry Number:	2551-62-4

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Air Tetrafluoromethane Water	< 6 ppm < 2 ppm < 2 ppm	300 series brass regulators
PurityPlus 4.0	99.99%	Air Tetrafluoromethane Water Oil Acidity (as HF)	< 50 ppm < 40 ppm < 5 ppm < 2 ppm < 0.3 ppm	300 series brass regulators
PurityPlus 3.0	99.9%	Air Tetrafluoromethane Water Oil Acidity (as HF)	< 300 ppm < 300 ppm < 8 ppm < 5 ppm < 0.3 ppm	200 series brass regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	115	320	590	
80	35	320	590	
30	10	320	590	

*Nonstandard cylinder sizes available upon request

PurityPlus™ Specialty Gases

Tetrafluoromethane (HC-14)

A colorless, odorless, nonflammable gas.

Technical Information:	
Chemical Symbol:	CF_4
Molecular Weight:	88.005
Specific Volume	4.40 ft^3/lb (0.027 m^3/kg)
CAS Registry Number:	75-73-0

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Oxygen/Argon Nitrogen CO/CO_2 Other Halocarbons Sulfur Hexafluoride Water Acidity (as HF)	< 1 ppm < 4 ppm < 1 ppm < 2 ppm < 1 ppm < 1 ppm < 0.1 ppm	300 series brass regulators
PurityPlus 4.0	99.99%	Oxygen/Argon Nitrogen CO/CO_2 Other Halocarbons Sulfur Hexafluoride Water Acidity (as HF)	< 5 ppm < 20 ppm < 10 ppm < 5 ppm < 5 ppm < 3 ppm < 0.01 ppm	300 series stainless steel regulators

Standard Cylinder Sizes *	Contents lbs	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region
200	70	2000	320	
80	20	2000	320	
LB	0.1	500	320/180	

*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^3/lb (0.18 m^3/kg)
CAS Registry Number:	7440-63-3

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

Grade	Purity	Impurity	Maximum	Equipment Recommended
PurityPlus 5.0	99.999%	Krypton Water Hydrogen Oxygen Nitrogen Nitrous Oxide Total Hydrocarbons Tetrafluoromethane Carbon Dioxide Hexafluoroethane Total Impurities	 10 ppm	400 series brass regulators

Standard Cylinder Sizes *	Contents ft^3/m^3	Cylinder Pressure PSIG	CGA Valve Connection	Customer Service and Ordering info available from Local Distributors by Region

*Nonstandard cylinder sizes available upon request

Laser Mixtures.

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

Shipping Information:	
DOT/TC Proper Name:	Compressed Gas NOS (Nitrogen, Helium)
Hazard Class:	2.2
I.D. Number:	UN 1956
Labels:	Nonflammable Gas

Carbon Dioxide Laser Mixtures (three, four, and five gases)

Mixture *	CGA	Size *	Pressure	Equipment Recommended
3.4% CO_2 / 15.6% N_2 / He **4.5% CO_2 / 13.5% N_2 / He** **6% CO_2 / 18% N_2 / He** **4.5% CO_2 / 13.5% N_2 / He** **5% CO_2 / 40% N_2 / He**	580	300	2400	601 series laser regulators
2% CO / 6% CO_2 / 6% N_2 / He **2% CO / 8% CO_2 / 8% N_2 / He** **2% CO / 8% CO_2 / 16% N_2 / He** **4% CO / 8% CO_2 / 16% N_2 / He** **4% CO / 8% CO_2 / 16% He / N_2** **4% CO / 8% CO_2 / 28% He / N_2**	350	300	2000	601 series laser regulators
0.4% H_2 / 4% CO / 8% CO_2 / 8% N_2 / He **0.4% H_2 / 4% CO / 6% CO_2 / 12% N_2 / He**	350	300	2000	601 series laser regulators

*Other combinations and sizes available upon request

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 local IWDC distributor 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 1×10^{-9} cc/sec He (1 billionth of a cc/sec). In this case, a Helium Leak integrity rating of 1×10^{-9} would indicate that the regulator would leak enough gas to fill a cubic centimeter every 33 years. If the rating were 1×10^{-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 compatibility charts on pages 5-7 or consult your gas supplier 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.

PurityPlus™ Specialty Gases

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 table which starts on the facing page. For further criteria, consider page 8 entitled Choosing a Regulator and finally the description of each regulator series in this catalog. If you are having problems deciding, feel free to call your IWDC distributor for a recommendation. 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 gas supplier for proper selection of the inlet connection. A "-000" at the end of the part number indicates no inlet connection (¼" 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, CONCOA 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 ¼" 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
Series 422	**Outlet Pressure / Outlet Gauge** **1:** 0-15* / 30"-0-30 PSIG **2:** 0-50 / 30"-0-100 PSIG **3:** 0-100 / 30"-0-200 PSIG **4:** 0-250 / 0-400 PSIG **5:** 0-500 / 0-1000 PSIG **7:** 0-150 / 30"-0-200 PSIG **Not available with 4500 PSIG maximum inlet pressure*	**Inlet Gauge** **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 (300 BAR) with PCTFE Seat Capsule*	**Outlet Assemblies** **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:** Diaphragm Valve ⅛" Tube Fitting **9:** Diaphragm Valve ¼" FPT **A:** ⅜" BSP Right Hand Fitting **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges) **4:** Cleanroom Assembly (PSIG/kPa Gauges) **5:** Cleanroom Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼" FPT **TF2:** ⅛" Tube **TF4:** ¼" Tube **TF6:** ⅜" Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **A:** Protocol Alarm Station (110V) **B:** Protocol Alarm Station (220V) **C:** Protocol Switchover Station **D:** Deep Purge **G:** Protocol Switchover Station with Alarm (110V) **H:** Protocol Switchover Station with Alarm (220V)

Materials Compatibility

		Regulators							Other	
		100 Series	200 Series	300 Series		400 Series			500 Series	
Pure Gases	Formula	Brass	Plated Brass	Plated Brass	Stainless Steel	Aluminum	Brass	Stainless Steel	Brass	Stainless Steel
Acetylene	C_2H_2									
Purified, 99.6%			•	•	•	•	•	•	•	•
Air										
Ultra Zero			•	•	•	•	•	•	•	•
Zero			•	•	•	•	•	•	•	•
Synthetic Compressed		•	•	•	•	•	•	•	•	•
Dry		•	•	•	•	•	•	•	•	•
Ammonia	NH_3									
Electronic, 99.999%								•		
Anhydrous, 99.99%					•	•		•		
Argon	Ar									
Research, 99.9995%								•		•
Ultra High Purity, 99.999%				•	•	•	•	•	•	•
Zero, 99.998%			•	•	•	•	•	•	•	•
Prepurified, 99.998%			•	•	•	•	•	•	•	•
High Purity, 99.99%		•	•	•	•	•	•	•	•	•
Arsine	AsH_3									
Electronic, 99.995%								•		
n-Butane	C_4H_{10}									
Research, 99.9%			•	•	•	•	•	•	•	•
CP 99.9%			•	•	•	•	•	•	•	•
Carbon Dioxide	CO_2									
Research, 99.998%				•	•	•	•	•		
Anaerobic, 99.99%			•	•	•	•	•	•		
Instrument, 99.99%			•	•	•	•	•	•		
Bone Dry, 99.9%			•	•	•	•	•	•		
Carbon Monoxide	CO									
Research, 99.99%				•	•		•	•	•	•
CP, 99.5%				•	•		•	•	•	•
Technical, 98.5%				•	•		•	•	•	•
Chlorine	Cl_2									
High Purity, 99.5%					•			•		
CP, 99.7%					•			•		
Ethane	C_2H_6									
Research, 99.96%			•	•	•	•	•	•	•	•
Technical, 97.5%			•	•	•	•	•	•	•	•
Ethylene	C_2H_4									
Research, 9.98%			•	•	•	•	•	•	•	•
CP, 99.5%			•	•	•	•	•	•	•	•
Technical, 98.5%			•	•	•	•	•	•	•	•
Helium	He									
Research, 99.9999%					•			•		•
Ultra High Purity, 99.999%				•	•	•	•	•	•	•
Zero, 99.995%			•	•	•	•	•	•	•	•
Hydrogen	H_2									
Research, 99.9999%					•			•		•
Ultra High Purity, 99.999%				•	•		•	•	•	•
Zero, 99.9%			•	•	•		•	•	•	•
Prepurified, 99.99%			•	•	•		•	•	•	•
Extra Dry, 99.95%			•	•	•		•	•	•	•

		Regulators							Other	
		100 Series	200 Series	300 Series		400 Series			500 Series	
Pure Gases	Formula	Brass	Plated Brass	Plated Brass	Stainless Steel	Aluminum	Brass	Stainless Steel	Brass	Stainless Steel
Hydrogen Chloride	HCl									
Electronic, 99.99%								•		•
Technical, 99%								•		•
Hydrogen Sulfide	H_2S									
CP, 99.5%						•		•		•
Isobutane	C_4H_{10}									
Research, 99.96%			•	•	•	•	•	•	•	•
CP, 99%			•	•	•	•	•	•	•	•
Krypton	Kr									
Research, 99.995%				•	•	•	•	•	•	•
Methane	CH_4									
Research, 99.99%			•	•	•	•	•	•	•	•
Ultra High Purity, 99.97%			•	•	•	•	•	•	•	•
CP, 99%			•	•	•	•	•	•	•	•
Technical, 98%			•	•	•	•	•	•	•	•
Commercial, 93%			•	•	•	•	•	•	•	•
Methyl Chloride	CH_3Cl									
CP, 99.5%					•			•		•
Neon	Ne									
Research, 99.999%				•	•	•	•	•	•	•
Purified, 99.99%			•	•	•	•	•	•	•	•
Nitric Oxide	NO_2									
CP, 99%					•			•		•
Nitrogen	N_2									
Research, 99.9995%					•			•		•
Ultra High Purity, 99.999%				•	•		•	•	•	•
Zero, 99.998%			•	•	•	•	•	•	•	•
Vehicle Emission			•	•	•	•	•	•	•	•
Prepurified, 99.998%			•	•	•	•	•	•	•	•
High Purity, 99.99%		•	•	•	•	•	•	•	•	•
Nitrous Oxide	N_2O									
Electronic, 99.99%			•	•	•	•	•	•	•	•
CP, 99%			•	•	•	•	•	•	•	•
Oxygen	O_2									
Research, 99.995%				•	•		•	•	•	•
Ultra High Purity, 99.993%				•	•		•	•	•	•
MOS, 99.995%				•	•		•	•	•	•
Zero, 99.6%			•	•	•		•	•	•	•
Extra Dry, 99.6%			•	•	•		•	•	•	•
Phosphine	PH_3									
Electronic, 99.995%								•		
Propane	C_3H_8									
Research, 99.99%			•	•	•	•	•	•	•	•
Instrument, 99.5%			•	•	•	•	•	•	•	•
CP, 99%			•	•	•	•	•	•	•	•
Silane	SiH_4									
VLSI								•		
CCD								•		
Semiconductor								•		
Sulfur Hexafluoride	SF_6									
CP, 99.8%			•	•	•	•	•	•	•	•
Xenon	Xe									
Research, 99.995%				•	•	•	•	•	•	•

	Regulators							Other	
	100 Series	200 Series	300 Series		400 Series			500 Series	
Mixed Gases	Brass	Plated Brass	Plated Brass	Stainless Steel	Aluminum	Brass	Stainless Steel	Brass	Stainless Steel
Ammonia									
in Argon				•			•		•
in Helium				•			•		•
in Hydrogen				•			•		•
in Nitrogen				•			•		•
Argon									
in Helium		•	•	•		•	•	•	•
in Hydrogen		•	•	•		•	•	•	•
in Nitrogen		•	•	•		•	•	•	•
in Oxygen		•	•	•		•	•	•	•
Carbon Dioxide									
in Air		•	•	•	•	•	•	•	•
in Argon		•	•	•	•	•	•	•	•
in Helium		•	•	•	•	•	•	•	•
in Hydrogen		•	•	•	•	•	•	•	•
in Nitrogen		•	•	•	•	•	•	•	•
in Oxygen		•	•	•	•	•	•	•	•
Chlorine									
in Argon				•			•		•
in Helium				•			•		•
in Nitrogen				•			•		•
Helium									
in Argon		•	•	•	•	•	•	•	•
in Hydrogen		•	•	•	•	•	•	•	•
in Nitrogen		•	•	•	•	•	•	•	•
in Oxygen		•	•	•	•	•	•	•	•
Hydrogen									
in Argon		•	•	•	•	•	•	•	•
in Carbon Monoxide		•	•	•	•	•	•	•	•
in Helium		•	•	•	•	•	•	•	•
in Nitrogen		•	•	•	•	•	•	•	•
Hydrogen Chloride									
in Argon							•		•
in Helium							•		•
in Nitrogen							•		•
in Oxygen							•		•
Methane									
in Air (Any Grade)		•	•	•	•	•	•	•	•
in Argon		•	•	•	•	•	•	•	•
in Helium		•	•	•	•	•	•	•	•
in Hydrogen		•	•	•	•	•	•	•	•
in Nitrogen		•	•	•	•	•	•	•	•
Nitric Oxide									
in Argon				•			•		•
in Helium				•			•		•
in Nitrogen				•			•		•
Nitrogen									
in Argon		•	•	•	•	•	•	•	•
in Helium		•	•	•	•	•	•	•	•
in Hydrogen		•	•	•	•	•	•	•	•
in Oxygen		•	•	•	•	•	•	•	•
Oxygen									
in Argon		•	•	•	•	•	•	•	•
in Helium		•	•	•	•	•	•	•	•
in Nitrogen		•	•	•	•	•	•	•	•

PurityPlus™ Specialty Gases

202 Series

single stage, brass body regulator

Description

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.

Advanced Features

- Chrome-plated forged brass body
  Economical high purity design
- High flow capacity
  Supply multiple user locations
- Pressure ranges 0-15 to 0-200 PSIG
  Broad range of applications

Typical Applications

- Gas supply purging
- Gas system charging
- Fuel gas supply control
- Calibration gas control
- Atomic absorption acetylene

200 Series Advantage

- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Forged body*
  Durable, long-lasting construction
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Large convoluted diaphragm*
  Smooth pressure changes
- *Standard relief valve*
  Diaphragm and gauge protection

Materials

Body
Chrome-plated forged brass

Bonnet
Chrome-plated die cast zinc

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2½" diameter chrome-plated brass

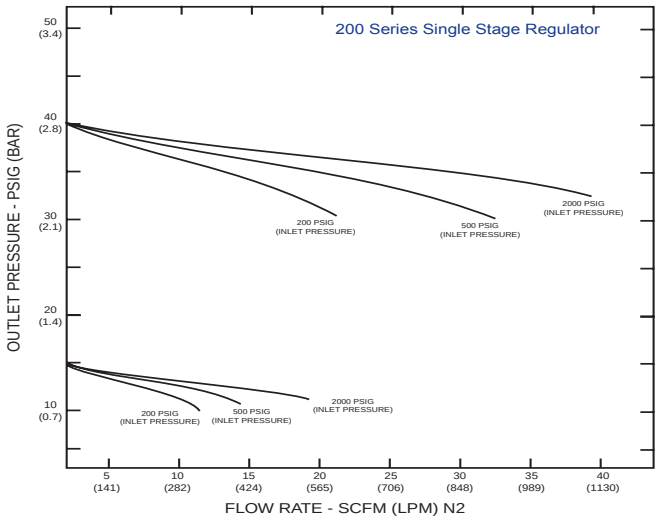
Ports
¼" FPT

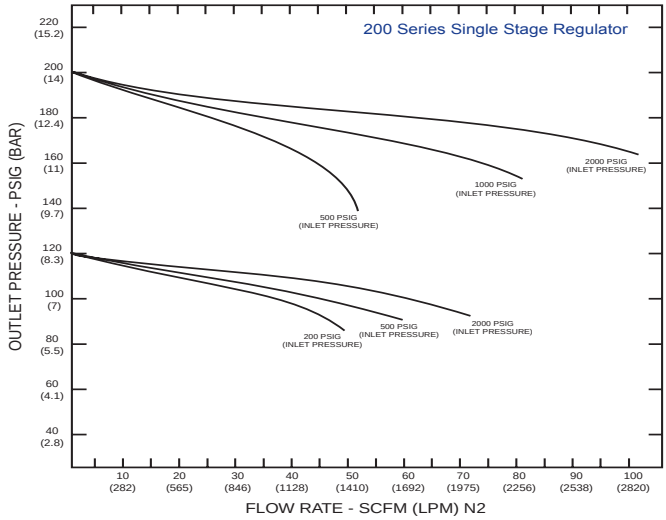
Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.2

Weight (202-3331-580)
3.8 lbs. (1.74 kg)

Flow Performance





Ordering Information and Configuration Options

202	A	B	C	D	Inlet	Options
Series 202	**Outlet Pressure / Outlet Gauge** **1:** 0-15* / 0-30 PSIG **2:** 0-40 / 0-60 PSIG **3:** 0-120 / 0-200 PSIG **4:** 0-200 / 0-400 PSIG **5:** 0-15* / 0-30 PSIG with redline for acetylene use **Not available with 4500 PSIG maximum inlet pressure*	**Inlet Gauge** **0:** None **3:** 0-4000 PSIG **5:** 0-1000 PSIG **6:** 0-400 PSIG **9:** 0-600 PSIG	**Outlet Assemblies** **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:** Diaphragm Valve ⅛" Tube Fitting **9:** Diaphragm Valve ¼" FPT **A:** ⅜" BSP Right Hand Fitting **B:** Diaphragm Valve ⅜" Tube Fitting **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼" FPT **TF2:** ⅛" Tube **TF4:** ¼" Tube **TF6:** ⅜" Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **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 **T:** Tee Purge

PurityPlus™ Specialty Gases

302 Series

single stage, brass barstock regulator

Description

The 302 Series regulators are intended for primary pressure control of noncorrosive, high purity or liquefied gases or for applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.

Advanced Features

- Chrome-plated brass barstock body
  Smooth surface finish
- Rear panel mountable
  Easy installation
- Pressure ranges 0-15 to 0-500 PSIG
  Broad range of applications

Typical Applications

- Gas and liquid chromatography
- High purity carrier gases
- Zero, span and calibration gases
- High purity chamber pressurization
- Liquefied hydrocarbon gas control
- Control of cryogenic gases

300 Series Advantage

- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Convoluted diaphragm*
  Smooth pressure changes
- *Compact design*
  Easily transported and integrated

Materials

Body
Chrome-plated brass barstock

Bonnet
Chrome-plated die cast zinc

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2" diameter chrome-plated

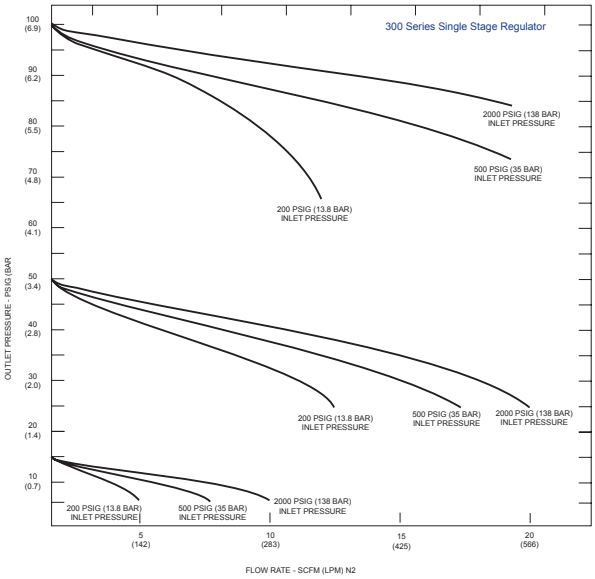
Ports
¼" FPT

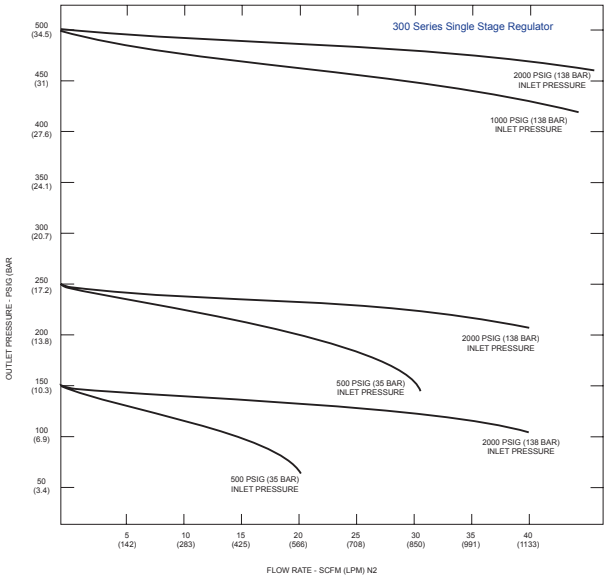
Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.1

Weight (302-2331-580)
3.1 lbs. (1.40 kg)

Flow Performance





Ordering Information and Configuration Options

302	A	B	C	D	Inlet	Options
Series 302	**Outlet Pressure / Outlet Gauge** **1:** 0-15* 30”-0-30 PSIG **2:** 0-50 30”-0-100 PSIG **3:** 0-100 30”-0-200 PSIG **4:** 0-250 0-400 PSIG **5:** 0-500 0-1000 PSIG **7:** 0-150 30”-0-200 PSIG **Not available with 4500 PSIG maximum inlet pressure*	**Inlet Gauge** **0:** None **3:** 0-4000 PSIG **5:** 0-1000 PSIG **6:** 0-300 PSIG **7:** 0-400 PSIG **8:** 0-6000 PSIG	**Outlet Assemblies** **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:** Diaphragm Valve ⅛” Tube Fitting **9:** Diaphragm Valve ¼” FPT **A:** ⅜” BSP Right Hand Fitting **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼” FPT **TF2:** ⅛” Tube **TF4:** ¼” Tube **TF6:** ⅜” Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **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 **T:** Tee Purge* **Not available with 4500 PSIG max inlet pressure*

PurityPlus™ Specialty Gases

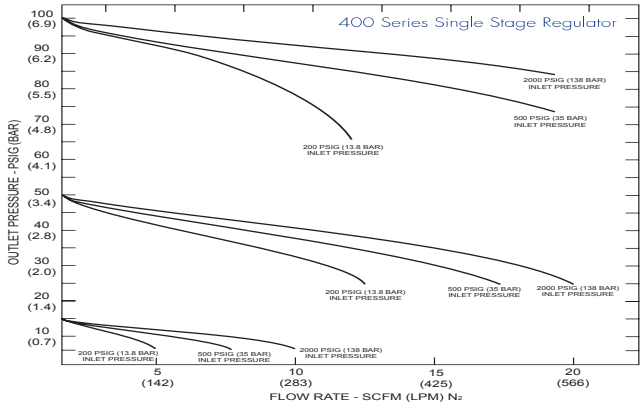
408 Series

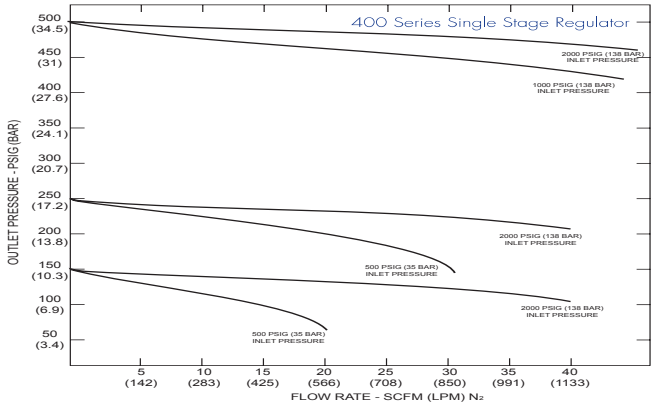
single stage, aluminum barstock regulator

Description	Advanced Features	Typical Applications
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.	• *Anodized aluminum body* Cost-effective corrosion resistance • Front and rear panel mountable Versatile system configuration • Pressure ranges 0-15 to 0-500 PSIG Broad range of applications	• Semi-corrosive gases and mixtures • Gas and liquid chromatography • High purity carrier gases • Zero, span and calibration gases • High purity chamber pressurization • Mildly corrosive gases

400 Series Advantage	Materials	Specifications
• *Metal-to-metal diaphragm seal* No possibility of gas contamination • *Capsule® seat* Increased serviceability and life • *316L stainless steel diaphragm* No inboard diffusion • *Orientable captured vent capable* Safety in any installation • *Low wetted surface area* Minimal purge requirements • *Field-adjustable pressure limit* Safeguard downstream equipment • *Pipe away relief valve* Safely vent exhaust gases • *Delivery pressure range easily changed* Maximum flexibility	*Body* Anodized aluminum barstock *Bonnet* Anodized aluminum barstock *Seat* PTFE *Filter* 10 micron stainless steel multi-layer mesh *Diaphragm* 316L stainless steel *Internal Seals* PTFE	*Maximum Inlet Pressure* 3000 PSIG (210 BAR) *Temperature Range* -40°F to 140°F (-40°C to 60°C) *Gauges* 2” diameter stainless steel *Ports* ¼” FPT *Helium Leak Integrity* 1 x 10^{-9} scc/sec *Cv* 0.1 *Weight (408-2331-660)* 2.7 lbs. (1.24 kg)

Flow Performance





Ordering Information and Configuration Options

408	A		B	C	D	-Inlet
Series 408	**Outlet Pressure**	**Outlet Gauge**	Inlet Gauge	**Outlet Assemblies**	**Assembly/Gauges**	**Connections**
	1: 0-15	30”-0-30 PSIG	0: None	**0:** ¼” FPT Port	**0:** Bare Body	**000:** ¼” FPT
	2: 0-50	30”-0-100 PSIG	3: 0-4000 PSIG	**1:** ¼” MPT	**1:** Standard Assembly (PSIG/kPa Gauges)	**TF2:** ⅛” Tube
	3: 0-100	30”-0-200 PSIG	5: 0-1000 PSIG	**2:** ¼” Tube Fitting	**2:** Standard Assembly (BAR/PSIG Gauges)	**TF4:** ¼” Tube
	4: 0-250	0-400 PSIG	6: 0-300 PSIG	**3:** Diaphragm Valve ¼” Tube Fitting	**4:** Cleanroom Assembly (PSIG/kPa Gauges)	**TF6:** ⅜” Tube
	5: 0-500	0-1000 PSIG	7: 0-400 PSIG	**4:** Diaphragm Valve ¼” MPT	**5:** Cleanroom Assembly (BAR/PSIG Gauges)	CGA
	7: 0-150	30”-0-200 PSIG		**5:** Needle Valve ¼” MPT		DIN 477
				6: ⅛” Tube Fitting		BS 341
				7: ⅜” Tube Fitting		and others available
				8: Diaphragm Valve ⅛” Tube Fitting		
				9: Diaphragm Valve ¼” FPT		
				M: 6mm Tube Fitting		
				S: Diaphragm Valve 6mm Tube Fitting		

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	360° orientation for easy piping of vented gases to a safe location in the event of diaphragm failure. Material: Nickel-plated brass
Helium Leak Certification	476-0002	Inboard Helium leak certification to less than 1 x 10^{-8} cc/sec
Protocol Station	Add letter “M” after inlet	Convenient regulator wall mount, including tee, bracket, and flexible stainless steel pigtail with check valve in the inlet gland
Deep Purge	Add letter “D” after inlet	Installed on the inlet of the regulator to assure complete purging of the cylinder connection and regulator body. *(Please see page 117 for more information about purges.)*

PurityPlus™ Specialty Gases

422 Series

single stage, stainless steel barstock regulator

Description

The 422 Series regulators are intended for primary pressure control of ultrahigh purity and corrosive gases in applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.

Advanced Features

- 316L stainless steel barstock body
  Increased corrosion resistance
- Front and rear panel mountable
  Versatile system configuration
- Pressure ranges 0-15 to 0-500 PSIG
  Broad range of applications

Typical Applications

- Gas and liquid chromatography
- Ultra high purity carrier gases
- Zero, span and calibration gases
- High purity chamber pressurization
- Liquefied hydrocarbon gas control
- Control of cryogenic gases
- Corrosive gases

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Chrome-plated brass barstock

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron stainless steel multi-layer mesh

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2" diameter stainless steel

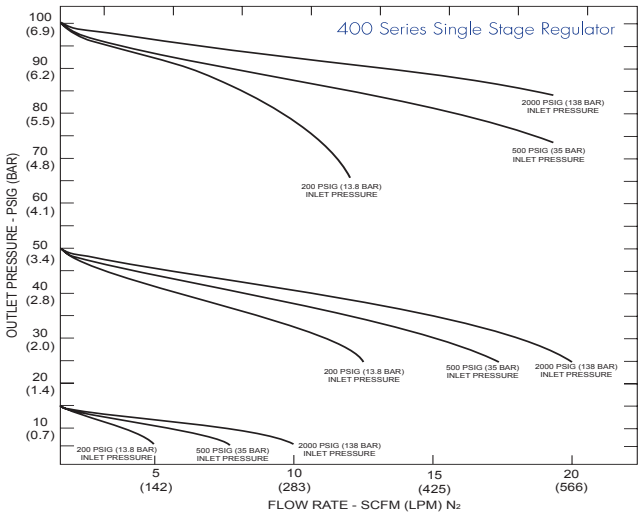
Ports
¼" FPT

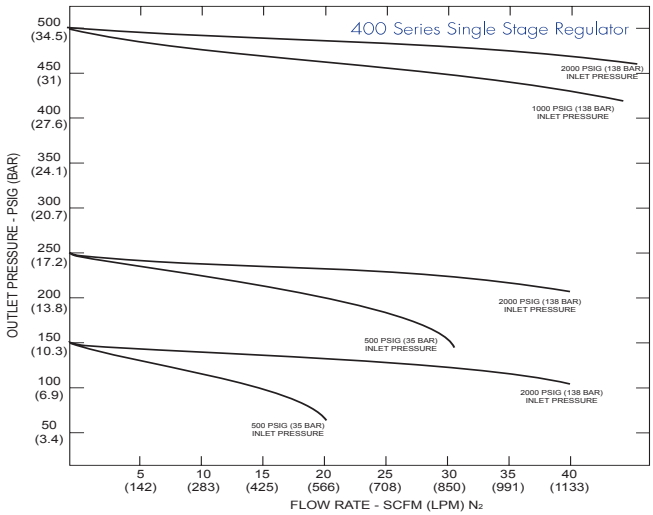
Helium Leak Integrity
1 x 10^{-9} scc/sec

Cv
0.1

Weight (422-2331-580)
3.8 lbs. (1.73 kg)

Flow Performance





Ordering Information and Configuration Options

422	A	B	C	D	-Inlet	Options
Series 422	**Outlet Pressure / Outlet Gauge** **1:** 0-15* 30”-0-30 PSIG **2:** 0-50 30”-0-100 PSIG **3:** 0-100 30”-0-200 PSIG **4:** 0-250 0-400 PSIG **5:** 0-500 0-1000 PSIG **7:** 0-150 30”-0-200 PSIG **Not available with 4500 PSIG maximum inlet pressure*	**Inlet Gauge** **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*	**Outlet Assemblies** **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:** Diaphragm Valve ⅛” Tube Fitting **9:** Diaphragm Valve ¼” FPT **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges) **4:** Cleanroom Assembly (PSIG/kPa Gauges) **5:** Cleanroom Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼” FPT **TF2:** ⅛” Tube **TF4:** ¼” Tube **TF6:** ⅜” Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **A:** Protocol Alarm Station (110V) **B:** Protocol Alarm Station (220V) **C:** Protocol Switchover Station **D:** Deep Purge **G:** Protocol Switchover Station with Alarm (110V) **H:** Protocol Switchover Station with Alarm (220V) **M:** Protocol Station
Related Options	• Panel Mount Kit (550-0002) • Captured Vent Kit (550-0001) • Helium Leak Certification (476-0002) • Passivation for Fluorine Service					

PurityPlus™ Specialty Gases

212 Series

two stage, brass body regulator

Description

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.

Advanced Features

- Chrome-plated forged brass body
  Economical high purity design
- High flow capacity
  Supply multiple user locations
- Pressure ranges 0-15 to 0-200 PSIG
  Broad range of applications
- 3000 PSIG inlet pressure rating
  Safe use with high pressure cylinders

Typical Applications

- Gas supply purging
- Gas system charging
- Fuel gas supply control
- Calibration gas control

200 Series Advantage

- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Forged body*
  Durable, long-lasting construction
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Large convoluted diaphragm*
  Smooth pressure changes
- *Standard relief valve*
  Diaphragm and gauge protection

Materials

Body
Chrome-plated forged brass

Bonnet
Chrome-plated die cast zinc

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2½" diameter chrome-plated brass

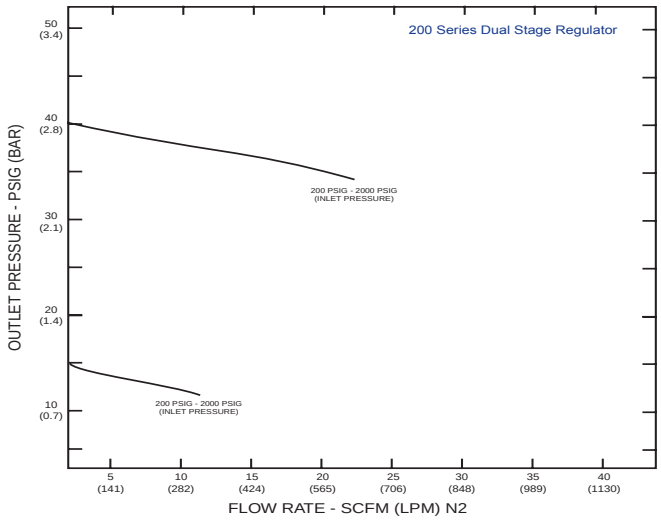
Ports
¼" FPT

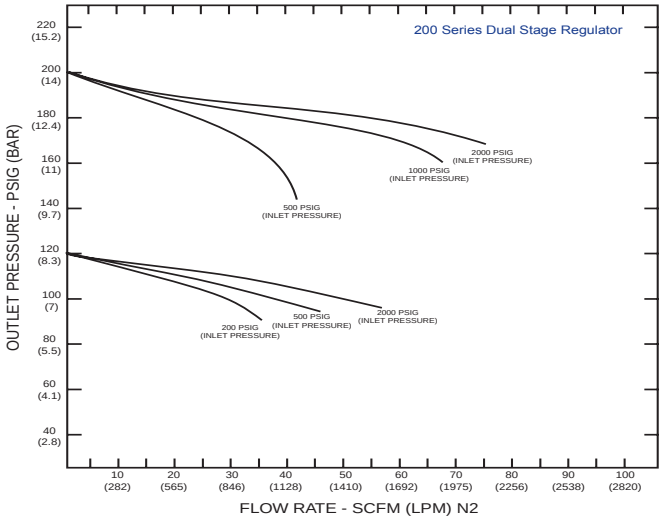
Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.28

Weight (212-3331-580)
5.1 lbs. (2.3 kg)

Flow Performance





Ordering Information and Configuration Options

212	A		B	C	D	Inlet	Options
Series 212	**Outlet Pressure** **1:** 0-15 **2:** 0-40 **3:** 0-120 **4:** 0-200 **5:** 0-15	**Outlet Gauge** 0-30 PSIG 0-60 PSIG 0-200 PSIG 0-400 PSIG 0-30 PSIG with redline for acetylene use	**Inlet Gauge** **0:** None **3:** 0-4000 PSIG **5:** 0-1000 PSIG **6:** 0-400 PSIG **8:** 0-6000 PSIG* **9:** 0-600 PSIG **Maximum inlet pressure 4500 PSIG (300 BAR) with PCTFE Seat Capsule*	**Outlet Assemblies** **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:** Diaphragm Valve ⅛" Tube Fitting **9:** Diaphragm Valve ¼" FPT **A:** ⅜" BSP Right Hand Fitting **B:** Diaphragm Valve ⅜" Tube Fitting **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼" FPT **TF2:** ⅛" Tube **TF4:** ¼" Tube **TF6:** ⅜" Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **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 **T:** Tee Purge* **Not available with 4500 PSIG max inlet pressure*

PurityPlus™ Specialty Gases

312 Series

two stage, brass barstock regulator

Description

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.

Advanced Features

- Chrome-plated brass barstock body
  Smooth surface finish
- 10 micron filtration in both stages
  Fail-safe seat performance
- Pressure ranges 0-15 to 0-250 PSIG
  Broad range of applications

Typical Applications

- EPA Protocol gases
- Gas and liquid chromatography
- High purity carrier gases
- Zero, span, and calibration gases
- High purity chamber pressurization

300 Series Advantage

- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Convoluted diaphragm*
  Smooth pressure changes
- *Compact design*
  Easily transported and integrated

Materials

Body
Chrome-plated brass barstock

Bonnet
Chrome-plated die cast zinc

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2" diameter chrome-plated

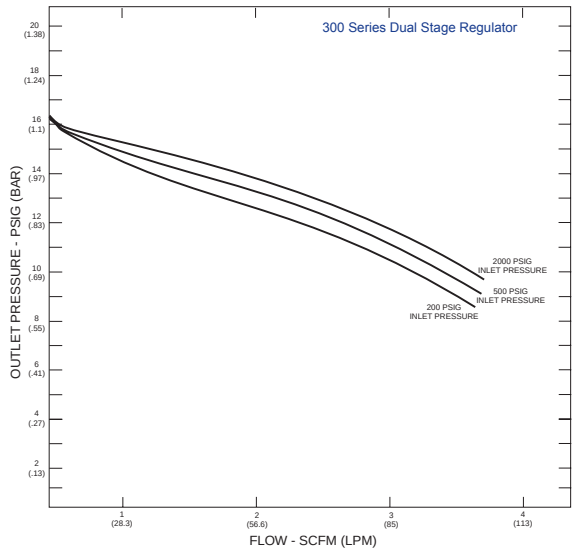
Ports
¼" FPT

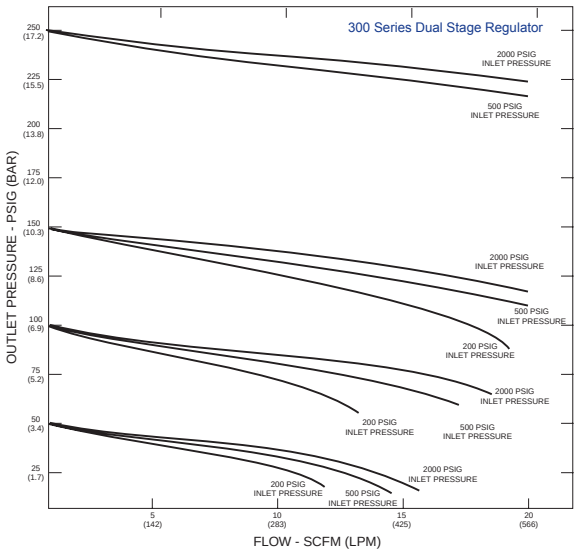
Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.1

Weight (312-2331-58)
4.4 lbs. (1.98 kg)

Flow Performance





Ordering Information and Configuration Options

312	A		B	C	D	Inlet	Options
Series 312	**Outlet Pressure** **1:** 0-15 **2:** 0-50 **3:** 0-100 **4:** 0-250 **7:** 0-150	**Outlet Gauge** 30”-0-30 PSIG 30”-0-100 PSIG 30”-0-200 PSIG 0-400 PSIG 30”-0-200 PSIG	**Inlet Gauge** **0:** None **3:** 0-4000 PSIG **5:** 0-1000 PSIG **6:** 0-300 PSIG **7:** 0-400 PSIG **8:** 0-6000 PSIG	**Outlet Assemblies** **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:** Diaphragm Valve ⅛” Tube Fitting **9:** Diaphragm Valve ¼” FPT **A:** ⅜” BSP Right Hand Fitting **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼” FPT **TF2:** ⅛” Tube **TF4:** ¼” Tube **TF6:** ⅜” Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **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 **T:** Tee Purge* **Not available with 4500 PSIG max inlet pressure*

PurityPlus™ Specialty Gases

432 Series

single stage, stainless steel barstock regulator

Description

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.

Advanced Features

- 316L stainless steel barstock body
  Increased corrosion resistance
- Front panel mountable
  Easy installation
- 10 micron filtration in both stages
  Fail-safe seat performance
- Pressure ranges 0-15 to 0-250 PSIG
  Broad range of applications

Typical Applications

- EPA protocol gases
- Gas and liquid chromatography
- High purity carrier gases
- Zero, span and calibration gases
- High purity chamber pressurization
- Corrosive gases

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Chrome-plated brass barstock

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron stainless steel multi-layer mesh

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2” diameter stainless steel

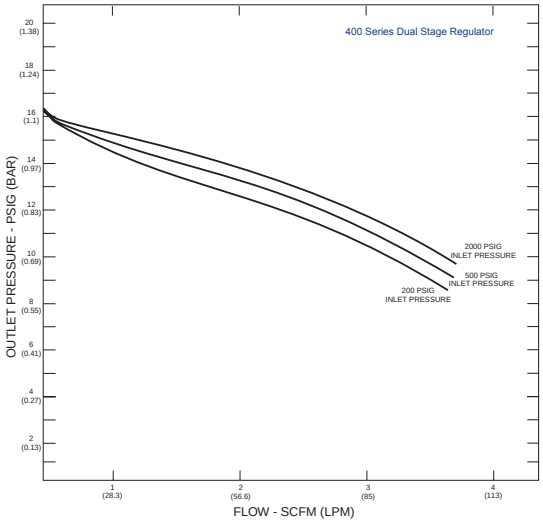
Ports
¼” FPT

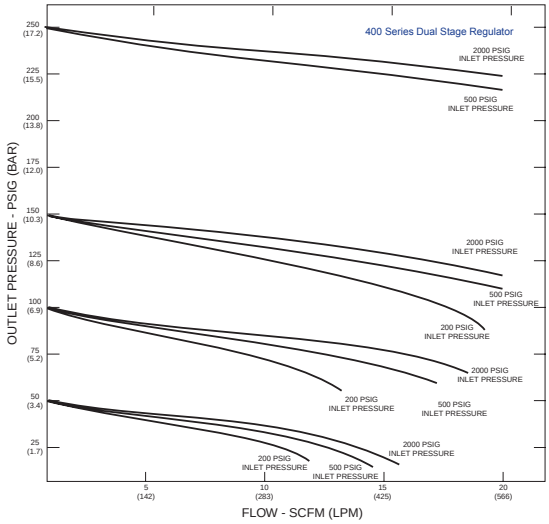
Helium Leak Integrity
1 x 10^{-9} scc/sec

Cv
0.1

Weight (432-2021-580)
5.09 lbs. (2.31 kg)

Flow Performance





Ordering Information and Configuration Options

432	A	B	C	D	-Inlet	Options
Series 432	**Outlet Pressure** / **Outlet Gauge** **1:** 0-15 — 30”-0-30 PSIG **2:** 0-50 — 30”-0-100 PSIG **3:** 0-100 — 30”-0-200 PSIG **4:** 0-250 — 0-400 PSIG **7:** 0-150 — 30”-0-200 PSIG	**Inlet Gauge** **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*	**Outlet Assemblies** **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:** Diaphragm Valve ⅛” Tube Fitting **9:** Diaphragm Valve ¼” FPT **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges) **4:** Cleanroom Assembly (PSIG/kPa Gauges) **5:** Cleanroom Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ¼” FPT **TF2:** ⅛” Tube **TF4:** ¼” Tube **TF6:** ⅜” Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **A:** Protocol Alarm Station (110V) **B:** Protocol Alarm Station (220V) **C:** Protocol Switchover Station **D:** Deep Purge **G:** Protocol Switchover Station with Alarm (110V) **H:** Protocol Switchover Station with Alarm (220V) **M:** Protocol Station
Related Options	• Panel Mount Kit (550-0002) • Captured Vent Kit (550-0001) • Helium Leak Certification (476-0002) • Passivation for Fluorine Service					

PurityPlus™ Specialty Gases

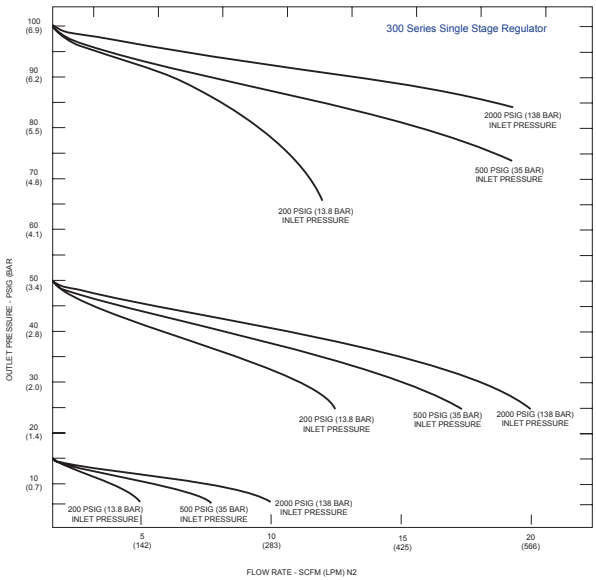
304 Series

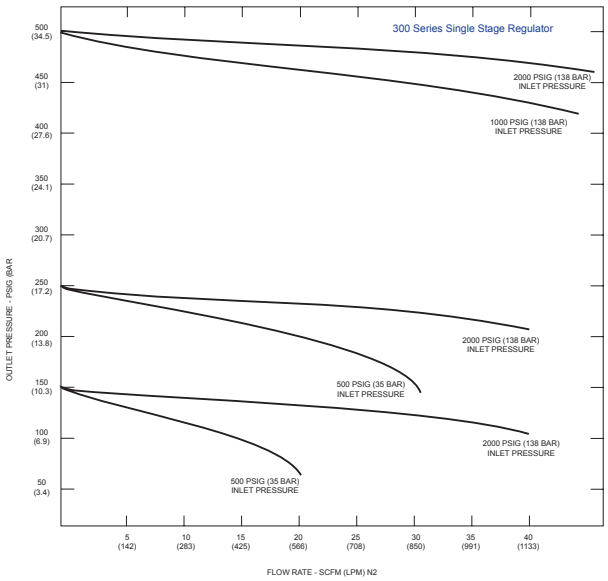
single stage, brass barstock line regulator

Description	Advanced Features	Typical Applications
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.	• Chrome-plated brass barstock body Smooth surface finish • Rear panel mountable Easy installation • Pressure ranges 0-15 to 0-500 PSIG Broad range of applications • 3000 PSIG inlet pressure rating Safe use with high pressure cylinders	• Bulk gas distribution systems • Gas and liquid chromatography • High purity carrier gases • Zero, span, and calibration gases • High purity chamber pressurization • Liquefied hydrocarbon gas control • Control of cryogenic gases

300 Series Advantage	Materials	Specifications
• *Capsule® seat* Increased serviceability and life • *316L stainless steel diaphragm* No inboard diffusion • *Low wetted surface area* Minimal purge requirements • *Field-adjustable pressure limit* Safeguard downstream equipment • *Convoluted diaphragm* Smooth pressure changes • *Compact design* Easily transported and integrated		

Flow Performance





Ordering Information and Configuration Options

304	A		B	C	D	Inlet	Options
Series 304	**Outlet Pressure**	**Outlet Gauge**	**Inlet Gauge**	**Outlet Assemblies**	**Assembly/ Gauges**	**Inlet Connections**	**Installed Options**
	1: 0-15	30”-0-30 PSIG	**0:** None	**0:** ¼” FPT Port	**0:** Bare Body	**000:** ¼” FPT	None
	2: 0-50	30”-0-100 PSIG		**1:** ¼” MPT	**1:** Standard Assembly (PSIG/kPa Gauges)	**TF2:** ⅛” Tube	
	3: 0-100	30”-0-200 PSIG		**2:** ¼” Tube Fitting	**2:** Standard Assembly (BAR/PSIG Gauges)	**TF4:** ¼” Tube	
	4: 0-250	0-400 PSIG		**3:** Diaphragm Valve ¼” Tube Fitting		**TF6:** ⅜” Tube	
	5: 0-500	0-1000 PSIG		**4:** Diaphragm Valve ¼” MPT		**M06:** 6mm Tube	
	7: 0-150	30”-0-200 PSIG		**5:** Needle Valve ¼” MPT			
				6: ⅛” Tube Fitting			
				7: ⅜” Tube Fitting			
				8: Diaphragm Valve ⅛” Tube Fitting			
				9: Diaphragm Valve ¼” FPT			
				A: ⅜” BSP Right Hand Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

PurityPlus™ Specialty Gases

445 Series

single stage, stainless steel barstock line regulator

Description

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.

Advanced Features

- Stainless steel barstock body
  Smooth surface finish
- Front and rear panel mountable
  Versatile system configuration
- Pressure ranges 0-15 to 0-500 PSIG
  Broad range of applications
- 3000 PSIG inlet pressure rating
  Safe use with high pressure cylinders

Typical Applications

- Bulk gas distribution systems
- Gas and liquid chromatography
- High purity carrier gases
- Zero, span and calibration gases
- High purity chamber pressurization
- Liquefied hydrocarbon gas control
- Control of cryogenic gases
- Corrosive service

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Chrome-plated brass barstock

Seat
PTFE

Filter
10 micron stainless steel multi-layer mesh

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauge
2” diameter stainless steel

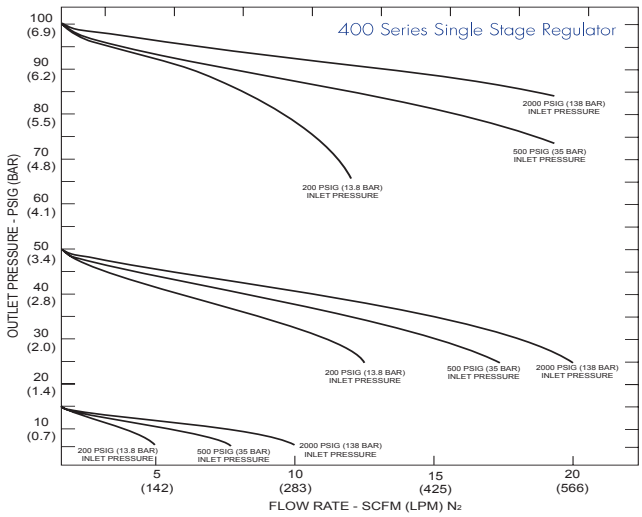
Ports
¼” FPT

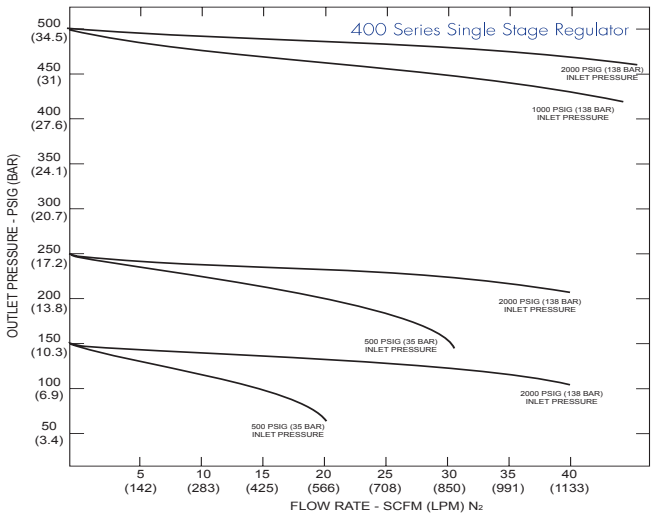
Helium Leak Integrity
1 x 10^{-9} scc/sec

Cv
0.1 (Max outlet 50 PSIG or below)
0.2 (Max outlet above 50 PSIG)

Weight (445-2021-TF4)
2.57 lbs. (1.17 kg)

Flow Performance





Ordering Information and Configuration Options

445	A	B	C	D	-Inlet	Options
Series 445	**Outlet Pressure** / **Outlet Gauge** **1:** 0-15 — 30”-0-30 PSIG **2:** 0-50 — 30”-0-100 PSIG **3:** 0-100 — 30”-0-200 PSIG **4:** 0-250 — 0-400 PSIG **5:** 0-500 — 0-1000 PSIG **7:** 0-150 — 30”-0-200 PSIG	**Inlet Gauge** **0:** None	**Outlet Assemblies** **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:** Diaphragm Valve ⅛” Tube Fitting **9:** Diaphragm Valve ¼” FPT **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **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)	**Inlet Connections** **000:** ¼” FPT **TF2:** ⅛” Tube **TF4:** ¼” Tube **TF6:** ⅜” Tube **M06:** 6mm Tube	**Installed Options** **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					

PurityPlus™ Specialty Gases

483 Series

single stage, brass barstock line regulator

Description

The 483 Series regulator applications are wide and varied including high flow purging, semiconductor manufacturing, manifold and line regulation.

Advanced Features

- Ultra High Flow
- Bulk gas distribution systems
- Gas and liquid chromatography
- High purity carrier gases
- Zero, span, and calibration gases
- High purity chamber pressurization
- Liquefied hydrocarbon gas control

Typical Applications

- Brass barstock body
  Smooth surface finish
- Rear panel mountable
  Versatile system configuration
- Pressure ranges 0-15 to 0-250 PSIG
  Broad range of applications
- 3000 PSIG inlet pressure rating
  Safe use with high pressure cylinders

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
Brass barstock

Bonnet
Chrome-plated die cast zinc

Seat
PCTFE

Filter
40 micron 316L stainless steel

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauge
2” diameter brass

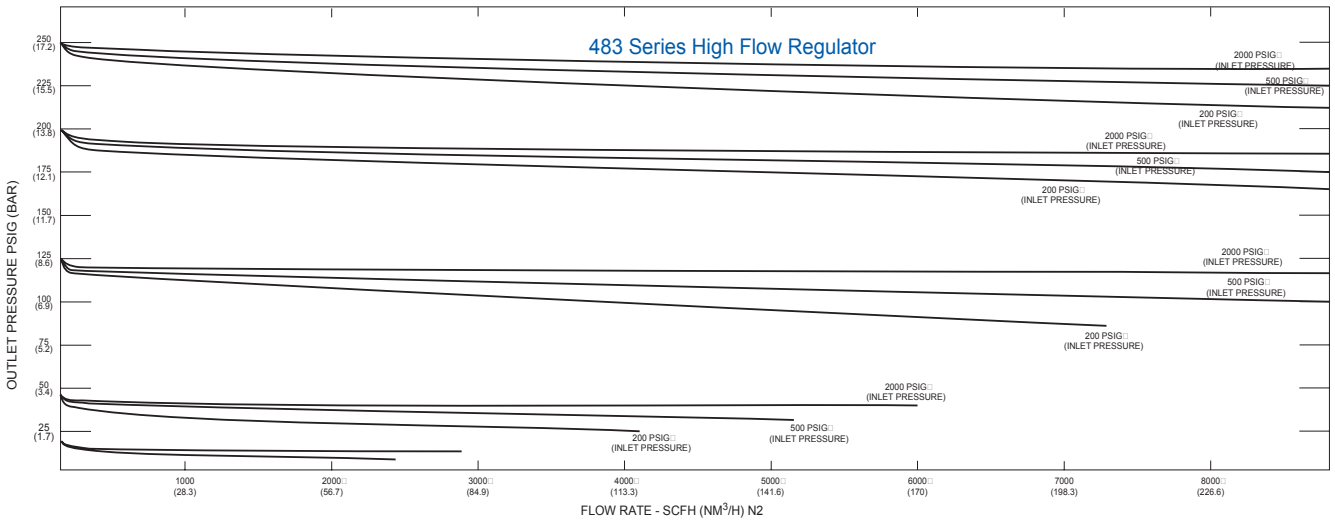
Ports
½” FPT (inlet/outlet)
¼” FPT (gauge/relief valve)

Helium Leak Integrity
1×10^{-8} scc/sec

Cv
1.0

Weight (483-3001-TF8)
4.79 lbs. (2.17 kg)

Flow Performance



Ordering Information and Configuration Options

483	A	B	C	D	-Inlet	Options
Series 483	**Outlet Pressure** / **Outlet Gauge** **1:** 0-15 / 0-30 PSIG **2:** 0-40 / 0-60 PSIG **3:** 0-120 / 0-200 PSIG **4:** 0-200 / 0-400 PSIG 5: 0-250 / 0-400 PSIG	**Inlet Gauge** **0:** None	**Outlet Assemblies** **0:** ½" FPT Port **1:** ½" Tube Fitting **P:** 12mm Tube Fitting	**Assembly/ Gauges** **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)	**Inlet Connections** **000:** ½" FPT **TF8:** ½" Tube **M12:** 12mm Tube	**Installed Options** None
Related Options	None					

PurityPlus™ Specialty Gases

484 Series

single stage, stainless steel barstock line regulator

Description

The 484 Series regulator applications are wide and varied including high flow purging, semiconductor manufacturing, manifold and line regulation.

Advanced Features

- Ultra High Flow
- Bulk gas distribution systems
- Gas and liquid chromatography
- High purity carrier gases
- Zero, span, and calibration gases
- High purity chamber pressurization
- Liquefied hydrocarbon gas control

Typical Applications

- 316L stainless steel barstock body
  Smooth surface finish
- Rear panel mountable
  Versatile system configuration
- Pressure ranges 0-15 to 0-250 PSIG
  Broad range of applications
- 3000 PSIG inlet pressure rating
  Safe use with high pressure cylinders

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Chrome-plated die cast zinc

Seat
PCTFE

Filter
40 micron 316L stainless steel

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauge
2” diameter stainless steel

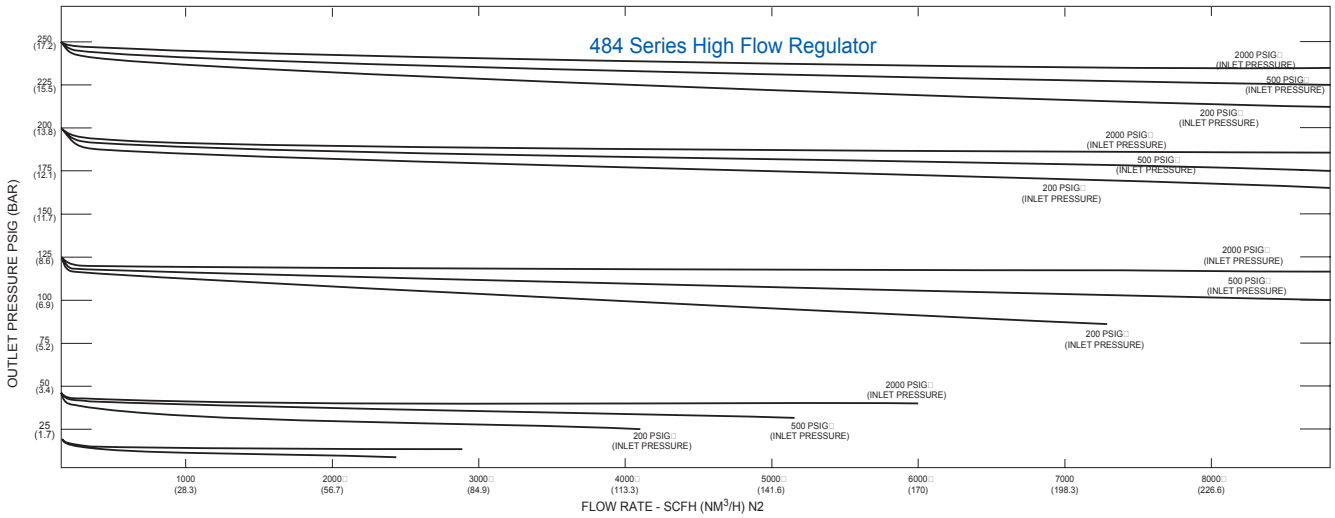
Ports
½” FPT (inlet/outlet)
¼” FPT (gauge/relief valve)

Helium Leak Integrity
1×10^{-8} scc/sec

Cv
1.0

Weight (484-3011-TF8)
4.52 lbs. (2.05 kg)

Flow Performance



Ordering Information and Configuration Options

484	A	B	C	D	-Inlet	Options
Series 484	**Outlet Pressure** / **Outlet Gauge** **1:** 0-15 / 0-30 PSIG **2:** 0-40 / 0-60 PSIG **3:** 0-120 / 0-200 PSIG **4:** 0-200 / 0-400 PSIG 5: 0-250 / 0-400 PSIG	**Inlet Gauge** **0:** None	**Outlet Assemblies** **0:** ½" FPT Port **1:** ½" Tube Fitting **P:** 12mm Tube Fitting	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges)	**Inlet Connections** **000:** ½" FPT **TF8:** ½" Tube **M12:** 12mm Tube	**Installed Options** None
Related Options		None				

PurityPlus™ Specialty Gases

308 Series

single stage, brass barstock heated regulator

Description

The 308 Series regulators are specifically designed to prevent freeze-up problems associated with high flows of carbon dioxide and nitrous oxide. As CO_2 or N_2O passes through a regulator seat, dry ice can form if the flow is too high, causing the regulator to freeze up.

Advanced Features

- Chrome-plated brass barstock body
  Smooth surface finish
- Three 50 watt heaters
  Maintain gas flow up to 350 scfh
- 316L stainless steel diaphragm
  Unaffected by low temperatures

Typical Applications

- Chemical storage blanketing
- Anaerobic chambers
- Inert gas purging
- Atomic absorption oxidizer gas
- Semiconductor reactor furnace
- Inductively coupled plasma systems
- Ph control

300 Series Advantage

- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Convoluted diaphragm*
  Smooth pressure changes
- *Compact design*
  Easily transported and integrated

Materials

Body
Chrome-plated brass barstock

Bonnet
Chrome-plated die cast zinc

Seat
PTFE

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range (Thermostat)
95°F to 120°F (35°C to 49°C)

Heaters
3 @ 50 watts each (110 or 220 VAC)

Gauges
2” diameter chrome-plated

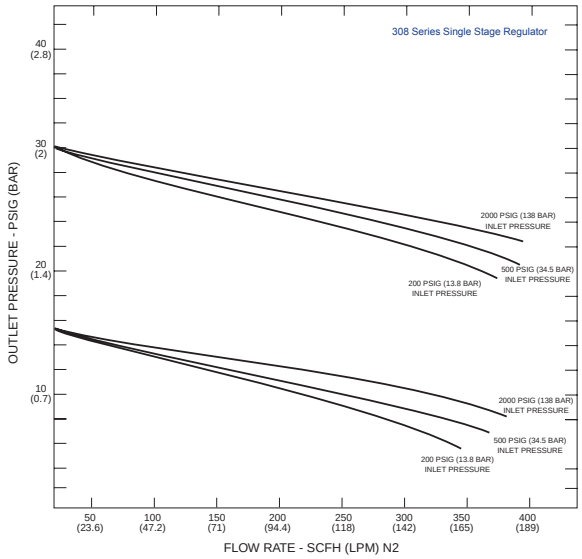
Ports
¼” FPT

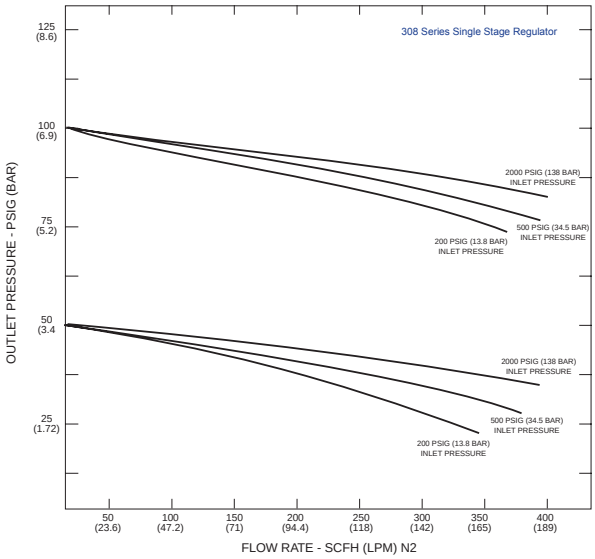
Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.1

Weight (308-3031-320)
5.4 lbs. (2.45 kg)

Flow Performance





Ordering Information and Configuration Options

308	A	B	C	D	Inlet	Options
Series 308	**Outlet Pressure / Outlet Gauge** **1:** 0-15 / 0-30 PSIG **2:** 0-30 / 0-60 PSIG **3:** 0-50 / 0-100 PSIG **5:** 0-100 / 0-200 PSIG	**Inlet Gauge** **0:** None **3:** 0-4000 PSIG	**Outlet Assemblies** **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:** Diaphragm Valve ⅛" Tube Fitting **9:** Diaphragm Valve ¼" FPT **A:** ⅜" BSP Right Hand Fitting **M:** 6mm Tube Fitting **S:** Diaphragm Valve 6mm Tube Fitting	**Assembly/ Gauges** **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)	**Inlet Connections** **000:** ¼" FPT **TF2:** ⅛" Tube **TF4:** ¼" Tube **TF6:** ⅜" Tube **M06:** 6mm Tube CGA DIN 477 BS 341 and others available	**Installed Options** **M:** Protocol Station

PurityPlus™ Specialty Gases

325 Series

single stage, brass barstock lecture bottle regulator

Description

The 325 Series regulators are specifically designed for use with noncorrosive gases in lecture bottles. The incorporation of our smallest Capsule® allows excellent pressure regulation over the useful pressure range of a lecture bottle.

Advanced Features

- Chrome-plated brass barstock body
  Smooth surface finish
- Low droop
  Stable outlet pressure
- 1½" pressure gauges
  Small envelope

Typical Applications

- University classrooms
- University laboratories
- Chemical research
- Pharmaceutical manufacturing

300 Series Advantage

- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Convoluted diaphragm*
  Smooth pressure changes
- *Compact design*
  Easily transported and integrated

Materials

Body
Chrome-plated brass barstock

Bonnet
Chrome-plated die cast zinc

Seat
PTFE

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
1½" diameter chrome-plated brass

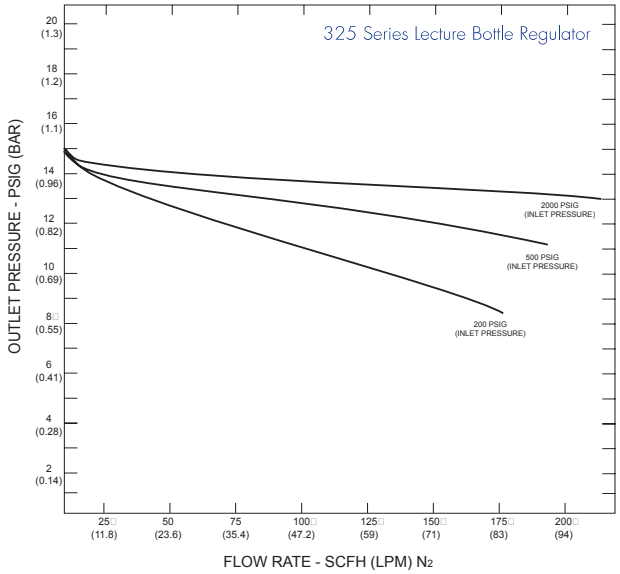
Ports
⅛" FPT (¼" FPT relief valve)

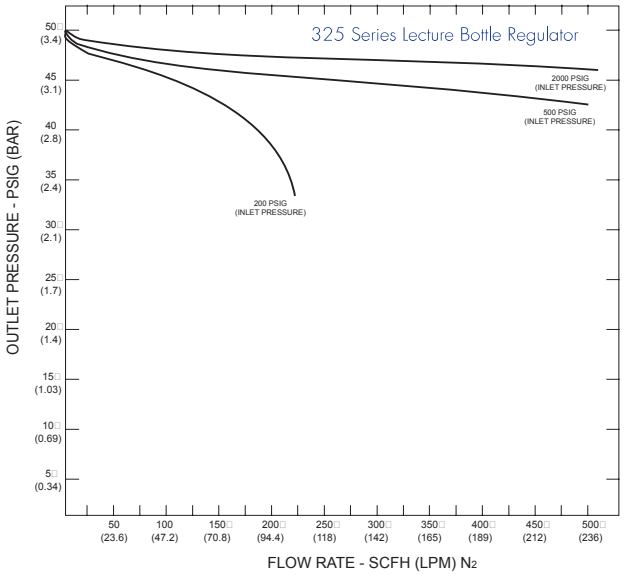
Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.02

Weight (325-3351-180)
2.0 lbs. (0.89 kg)

Flow Performance





Ordering Information and Configuration Options

325	A		B	C	D	Inlet	Options
Series 325	**Outlet Pressure** **1:** 0-15 **3:** 0-50	**Outlet Gauge** 0-30 PSIG 0-100 PSIG	**Inlet Gauge** **0:** None **3:** 0-4000 PSIG	**Outlet Assemblies** **0:** ⅛" FPT Port **1:** ¼" MPT **5:** Needle Valve ⅛" MPT	**Assembly/ Gauges** **0:** Bare Body **1:** Standard Assembly	**Connections** **000:** ⅛" FPT **CGA 110** **CGA 170** **CGA 180**	**Installed Options** None

PurityPlus™ Specialty Gases

Lecture Bottle Equipment

Series 3910 single stage brass lecture bottle regulator

Series 3920 single stage stainless steel lecture bottle regulator

Description

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

Advanced Features

- Small compact design.
- Needle valve installed on outlet.

Specifications

	Series 3910	Series 3900
Max. Inlet Pressure	3000 psig	3000 psig
Operating Temp. Range	0 to +140°F	-40 to +140°F
Flow Coefficient (C_v)	0.02	0.06
Body Inlet Connection	1/8" NPT female	1/8" NPT female
Body Outlet Connection	1/4" NPT female	1/8" NPT female
Outlet Valve Connection	1/4" NPT female	1/8" NPT female

Materials

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

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 bas 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
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
Body	brass	brass	316 stainless steel	aluminum-silicon bronze
Stem	303 stainless steel	303 stainless steel	316 stainless steel	Monel®
Packing	Teflon®	Teflon®	Teflon®	Teflon®
Tubing	hose barb	brass	316 stainless steel	Monel®

Ordering Information

Model Number	Inlet Connection	Outlet Connection
0990-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

PurityPlus™ Specialty Gases

428 Series

single stage, stainless steel barstock line regulator

Description

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.

Advanced Features

- Butt-welded VCR® connections
  Highest leak integrity available
- 316L stainless steel barstock body
  Increased corrosion resistance
- Front and rear panel mountable
  Versatile system configuration
- 3000 PSIG inlet pressure rating
  Safe use with high pressure cylinders

Typical Applications

- Semiconductor process gases
- Gas and liquid chromatography
- Ultra-high purity carrier gases
- Zero, span and calibration gases
- Liquefied hydrocarbon gas control
- Control of cryogenic gases

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Chrome-plated brass barstock

Seat
PTFE

Filter
10 micron stainless steel multi-layer mesh

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauge
2" diameter stainless steel

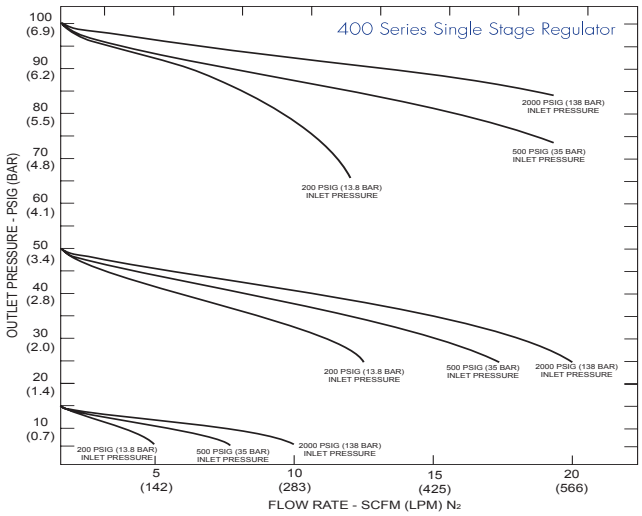
Ports
¼" VCR®

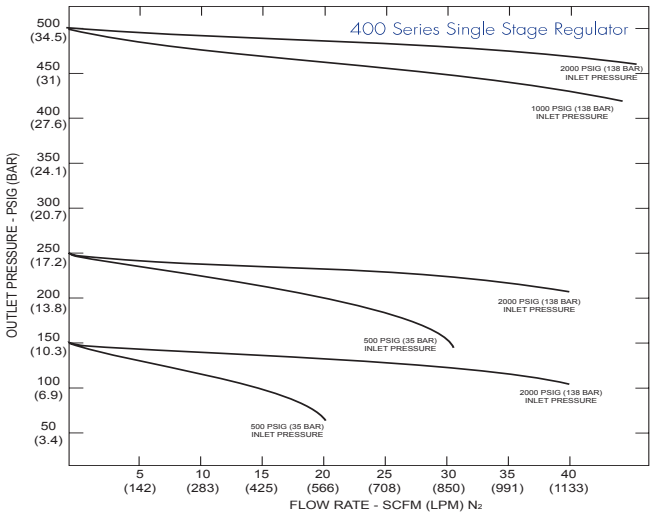
Helium Leak Integrity
1 x 10^{-9} scc/sec

Cv
0.1

Weight (428-1302)
2.46 lbs. (1.12 kg)

Flow Performance





Ordering Information and Configuration Options

428	A	B	C	D
Series 428	**Outlet Pressure** **1:** 0-15 **2:** 0-30 **3:** 0-50 **4:** 0-100 **5:** 0-250 **6:** 0-500 **7:** 0-150	**Outlet Gauge** **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	**Inlet Gauge** **0:** None	**Connections** **1:** FVCR in/MVCR out **2:** MVCR in/MVCR out **3:** MVCR in/FVCR out **4:** FVCR in/FVCR out

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	360° orientation for easy piping of vented gases to a safe location in the event of diaphragm failure. Material: Nickel-plated brass
Helium Leak Certification	476-0002	Inboard Helium leak certification to less than 1 x 10^{-8} scc/sec
Special Treatment	550-0003	Regulator preconditioned in actual gas usage (required for some fluoridated compounds)
0.01 micron filter	580-2001	Attached at outlet for low particle count gases (with ¼" VCR® connections only)

PurityPlus™ Specialty Gases

429 Series

single stage, stainless steel barstock line regulator

Description

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.

Advanced Features

- Semiconductor process gases
- Gas and liquid chromatography
- Ultra-high purity carrier gases
- Zero, span and calibration gases
- Liquefied hydrocarbon gas control
- Control of cryogenic gases

Typical Applications

- Butt-welded VCR® connections
  Highest leak integrity available
- 316L stainless steel barstock body
  Increased corrosion resistance
- Front and rear panel mountable
  Versatile system configuration
- 3000 PSIG inlet pressure rating
  Safe use with high pressure cylinders

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Chrome-plated brass barstock

Seat
PTFE

Filter
10 micron stainless steel multi-layer mesh

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2" diameter stainless steel

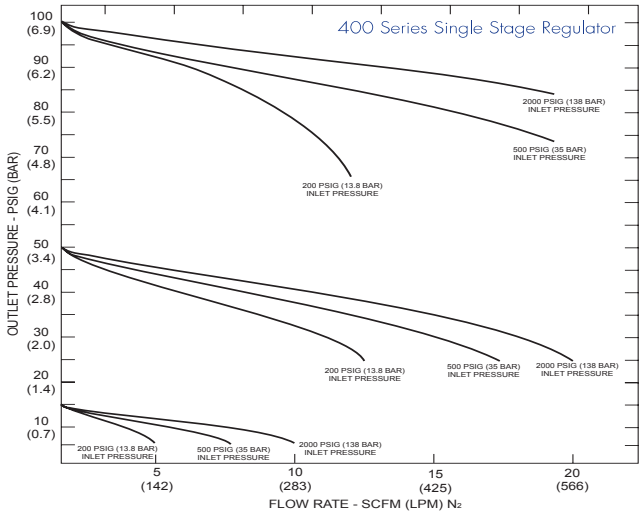
Ports
¼" VCR®

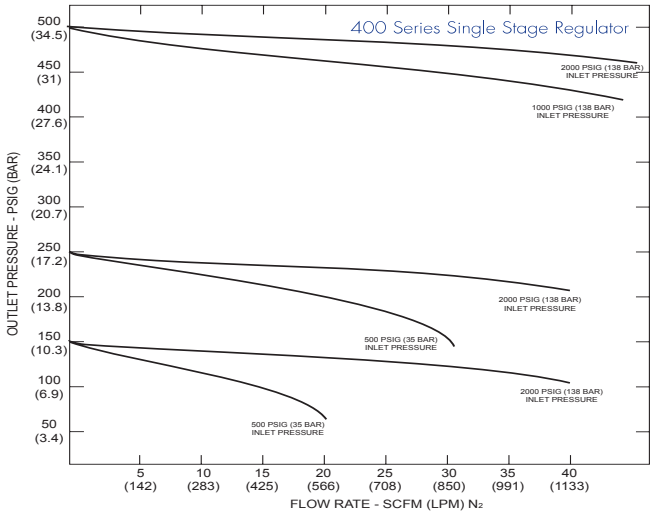
Helium Leak Integrity
1 x 10^{-9} scc/sec

Cv
0.1

Weight (429-1312)
2.73 lbs. (1.24 kg)

Flow Performance





Ordering Information and Configuration Options

429	A	B	C	D
Series 429	**Outlet Pressure** **1:** 0-15 **2:** 0-30 **3:** 0-50 **4:** 0-100 **5:** 0-250 **6:** 0-500 **7:** 0-150	**Outlet Gauge** **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	**Inlet Gauge** **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	**Connections** **1:** FVCR in/MVCR out **2:** MVCR in/MVCR out **3:** MVCR in/FVCR out **4:** FVCR in/FVCR out

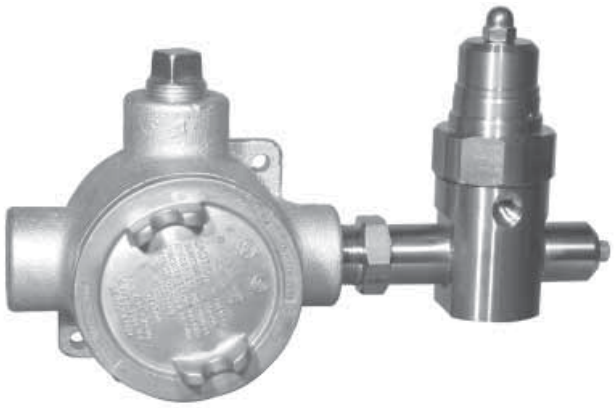
Related Options

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	360° orientation for easy piping of vented gases to a safe location in the event of diaphragm failure. Material: Nickel-plated brass
Helium Leak Certification	476-0002	Inboard Helium leak certification to less than 1 x 10^{-8} scc/sec
Special Treatment	550-0003	Regulator preconditioned in actual gas usage (required for some fluoridated compounds)
0.01 micron filter	580-2001	Attached at outlet for low particle count gases (with ¼" VCR® connections only)

PurityPlus™ Specialty Gases

452 Series

single stage, stainless steel barstock heated regulator



Description

The 452 Series electrically-heated vaporizing regulator is designed to heat and vaporize an inlet gas stream containing heavy hydrocarbons so that they will remain in the vapor state for chromatographic analysis. The entire system is explosion proof for safety. Included are three temperature ranges, three heater wattages, and seven outlet pressure ranges.

Advanced Features

- Increased serviceability and life
- Internal heat exchanger
  Improved heat transfer
- Adjustable thermistor controller
  Close control of gas temperature

Typical Applications

- 316L stainless steel barstock body
  Increased corrosion resistance
- Pressure ranges 0 - 15 to 0 - 500 PSIG
  Wide variety of applications
- Metal to metal seals
  No possibility of gas contamination
- Capsule Seat

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
316L stainless steel barstock

Bonnet
Stainless steel barstock

Seat
Arlon® (PEEK)

Diaphragm
316L stainless steel

Heat Exchanger
316L stainless steel

Explosion-proof Enclosure
Iron alloy/Aluminum

Heater Wattage
50, 100 or 150 watts

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
77˚F to 180˚F (25˚C to 82˚C)
160˚F to 280˚F (71˚C to 138˚C)
250˚F to 380˚F (121˚C to 193˚C)

Maximum Flow (100 PSIG)
600 SCFH (283 LPM)

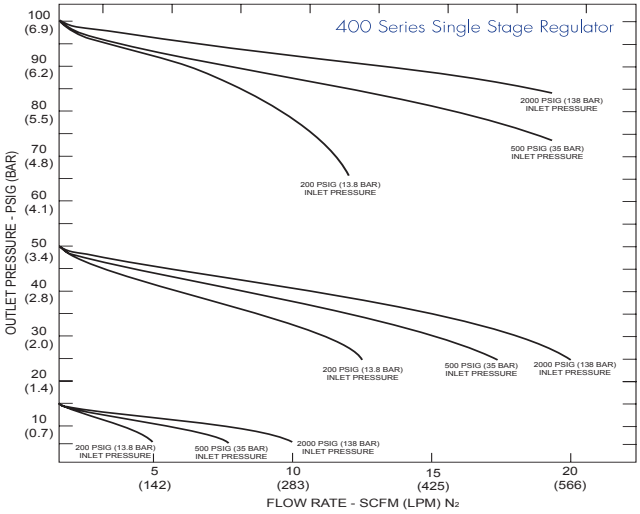
Inlet Connection
⅛" FPT

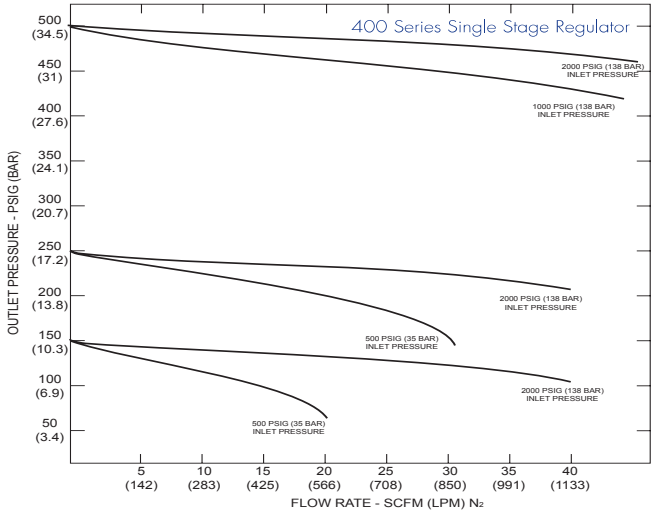
Outlet Connection
¼" FPT

Helium Leak Integrity
1×10^{-8} scc/sec

Weight (452-3301)
6 lbs. (2.7 kg)

Flow Performance





Ordering Information and Configuration Options

452	A	B	C	D	-Inlet
Series 452	**Max Delivery Pressure** 1: 15 PSIG 2: 50 PSIG 3: 100 PSIG 4: 250 PSIG 5: 500 PSIG 7: 150 PSIG	**Heater Wattage** 1: 50 Watts 2: 100 Watts 3: 150 Watts	**Outlet Connection** 0: ¼" FPT 1: ⅛" Tube Fitting 2: ¼" Tube Fitting 3: ⅜" Tube Fitting **M:** 6mm Tube Fitting	**Temperature Range/Voltage** 1: 77 ˚ - 180˚F/120 VAC 2: 160˚ - 280˚F/120 VAC 3: 250˚ - 380˚F/120 VAC* 4: 77˚ - 180˚F/220 VAC 5: 160˚ - 280˚F/220 VAC 6: 250˚ - 380˚F/220 VAC* **Not available with 50 Watt heater*	**Connections** 000: ⅛" FPT TF2: ⅛" Tube TF4: ¼" Tube TF6: ⅜" Tube **M06:** 6mm Tube

PurityPlus™ Specialty Gases

492 Series

single stage, brass barstock 6000 PSIG regulator

Description

The 492 Series regulators are intended for primary pressure control of non-corrosive gases at a maximum inlet pressure of 6000 PSIG.

Advanced Features

- Chrome-plated brass barstock body
  Smooth surface finish
- Front and rear panel mountable
  Versatile system configuration
- Pressure ranges 0-750 to 0-6000 PSIG
  Broad range of applications
- Six-port design
  Flexible installation alternatives

Typical Applications

- Airplane strut charging
- Research and development laboratories
- Chemical manufacturing
- Aerospace hydraulic systems
- Pharmaceutical manufacturing
- Gauge calibration

400 Series Advantage

- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *Capsule® seat*
  Increased serviceability and life
- *316L stainless steel diaphragm*
  No inboard diffusion
- *Orientable captured vent capable*
  Safety in any installation
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment
- *Pipe away relief valve*
  Safely vent exhaust gases
- *Delivery pressure range easily changed*
  Maximum flexibility

Materials

Body
Chrome-plated brass barstock

Bonnet
Chrome-plated brass barstock

Seat
PCTFE (3000 and 4500 PSIG inlet)
Arlon® (PEEK) (6000 PSIG inlet)

Piston
Brass barstock

Filter
10 micron sintered bronze

Internal Seals
Viton®

Specifications

Maximum Inlet Pressure
6000 PSIG (420 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

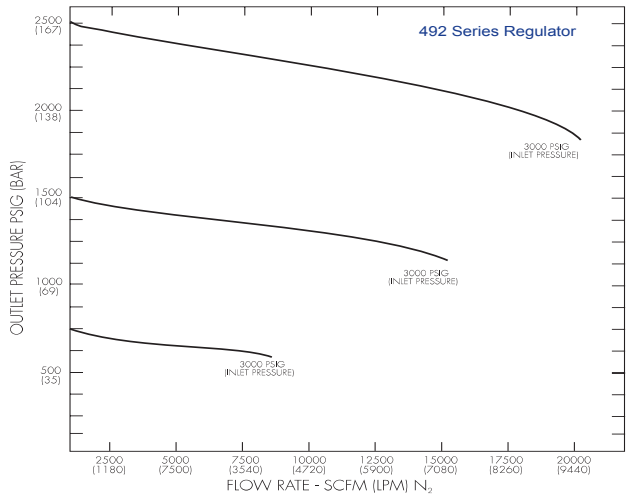
Gauges
2½" diameter chrome-plated brass

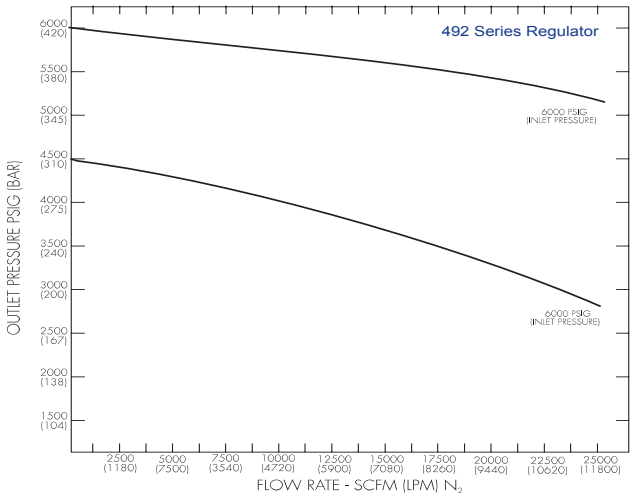
Ports
¼" FPT

Cv
0.1

Weight (492-4851-680)
5.59 lbs. (2.54 kg)

Flow Performance





Ordering Information and Configuration Options

492	A	B	C	D	-Inlet	Options
Series 492	**Outlet Pressure / Outlet Gauge** **1:** 0-750 / 0-1000 PSIG **2:** 0-1500 / 0-4000 PSIG **3:** 0-2500 / 0-4000 PSIG **4:** 0-4500* / 0-6000 PSIG **5:** 0-6000† / 0-10,000 PSIG **6:** 0-3500* / 0-6000 PSIG **Not available with 3000 PSIG maximum inlet pressure* *†Only available with 6000 PSIG maximum inlet pressure*	**Inlet Maximum / Inlet Gauge** **0:** 6000 PSIG / None **3:** 3000 PSIG / 0-4000 PSIG **8:** 5500 PSIG / 0-6000 PSIG **9:** 6000 PSIG / 0-10,000 PSIG	**Outlet Assemblies** **0:** ¼" FPT **1:** ¼" MPT **2:** ¼" Tube **5:** Needle Valve ¼" MPT **6:** ⅛" Tube **7:** ⅜" Tube **M:** 6mm Tube	**Assembly/ Gauges** **0:** Bare Body* **1:** Standard Assembly (PSIG/kPa Gauges) **2:** Standard Assembly (BAR/PSIG Gauges) **6000 PSIG maximum inlet only*	**Inlet Connections** CGA DIN 477 BS 341 and others available	**Installed Options** **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
Related Options	• Panel Mount Kit (830-6483)					

PurityPlus™ Specialty Gases

3550 Series

two stage, stainless steel regulator

Description

The series 3550 two stage regulators are designed and constructed for use with reactive and corrosive gases and gas mixtures. 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.

Advanced Features

- Monel® internal parts and body for added corrosion resistance.
- High purity diffusion resistant, metal diaphragm construction on both stages.
- Diffusion resistant, stainless steel diaphragm packless control valve installed on outlet as standard.

Typical Applications

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

Body
316L stainless steel

Poppets
Monel®

Poppet spring
Inconel®

Seats
1st stage - Tefzel
2nd stage - Tefzel

Diaphragms
Monel®

Diaphragm Gaskets
Teflon®

Inlet Filter
Monel®

Bonnet
chrome plated aluminum

Gauges
stainless steel

Outlet Valve
stainless steel

Specifications

Max. Inlet Pressure
3000 psig

Operating Temp. Range
-40 ° to +185 °F

Flow Coefficient (Cv)
0.07

Inlet and Outlet
1/4” NPT female

Ordering Information* * *

Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig
3551-25-CGA*	5-25	0-30	0-3000
3551-50-CGA*	5-50	0-100	0-3000
3551-100-CGA*	10-100	0-200	0-3000

*Specify CGA Connection Number when ordering.
***For panel mounting bonnet add “PM” to base number (i.e., 3461PM-50-CGA).

Outlet Options

	P/N Suffix
No Outlet Valve	NV
1/4” Compression Fitting	T4F
1/8” Compression Fitting	T2F
1/4” NPT Male	P4M
1/4” Hose Barb	4HB

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

single stage, monel® regulator

3460 Series

Description

The series 3460 single stage regulators are specifically designed and constructed for use with difficult to handle gases, like chlorine and hydrogen chloride. The monel® diaphragm, inlet filter, poppet and nozzle assembly installed in a monel® body with a 316 stainless steel bonnet create a high purity corrosive gas regulator for most difficult environments.

Advanced Features

- Monel® internal parts and body for added corrosion resistance.
- High purity diffusion resistant, metal diaphragm construction.
- Diffusion resistant, aluminum-silicon-bronze diaphragm packless control valve installed on outlet.

Typical Applications

The 3460 Series regulators are ideal for use with many corrosive gases, such as chlorine, hydrogen chloride, boron trichloride, and boron trifluoride under demanding environmental conditions. They are also useful for controlling the pressure of gas mixtures containing these corrosive gas components, particularly at high concentration levels.

Materials

Body
monel®

Poppet
Monel®

Poppet spring
Inconel®

Seat
Tefzel

Diaphragm
Monel®

Diaphragm Gasket
Teflon®

Inlet Filter
Monel®

Bonnet
stainless steel

Gauges
Monel®

Specifications

Max. Inlet Pressure
3000 psig

Operating Temp. Range
-40º to +185 ºF

Flow Coefficient (Cv)
0.07

Inlet and Outlet
1/4" NPT female

Ordering Information* * *

Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig
3461-25-CGA* 3461-50-CGA* 3461-100-CGA*	5-25 5-50 10-100	0-60 0-100 0-200	0-3000 0-3000 0-3000
3462-25-CGA* 3462-50-CGA* 3462-100-CGA*	5-25 5-50 10-100	0-60 0-100 0-200	0-1000 0-1000 0-1000
3463-25-CGA* 3463-50-CGA*	5-25 5-50	0-60 0-100	0-400 0-400
3464-25-CGA* 3464-50-CGA*	5-25 5-50	0-60 0-100	none none

Outlet Options

	P/N Suffix
No Outlet Valve 1/4" Compression Fitting	NV T4F

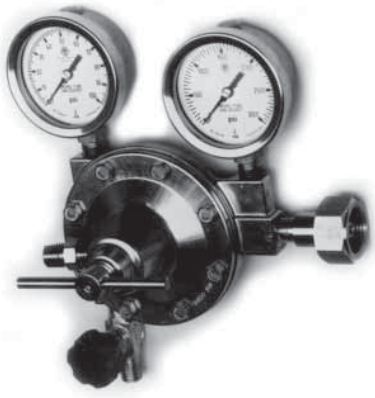
Warning: A Purge assembly is strongly suggested when using the above regulators with any corrosive gas.

*Specify CGA Connection Number when ordering. ***For panel mounting bonnet add "PM" to base number (i.e., 3461PM-50-CGA).

PurityPlus™ Specialty Gases

3470 Series

single stage, nickel plated brass regulator



Description

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.

Advanced Features

- Four built-in Kel-F seats provide convenient maintenance and long regulator life.
- Large Teflon-lined 302 stainless steel diaphragm.
- Monel valve with Teflon packing installed on outlet.
- Captured vent bonnet provides for save venting in the event of a diaphragm failure

Typical Applications

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

Body
Electroless nickel-plated brass

Nozzle
Monel

Seat
Kel-F

Diaphragm
Teflon-lined 302 stainless steel

Inlet Filter
Electroless nickel-plated sintered bronze

Seals
Teflon

Specifications

Max. Inlet Pressure
3000 psig

Operating Temp. Range
20° to +160°F

Body Inlet and Outlet
1/4” NPT female

Valve outlet
1/4” NPT male

Ordering Information

Model Number	Del. Press. Range psig	Del. Press. Gauge psig	Inlet Press. Gauge psig
3470-80-CGA* 3470-160-CGA*	5-80 10-160	0-100 0-300	0-3000 0-3000
3471-80-CGA* 3471-160-CGA*	5-80 10-160	0-100 0-300	0-1000 0-1000
3472-80-CGA* 3473-80-CGA*	5-80 5-80	0-100 0-100	0-300 none

*Specify CGA Connection Number when ordering.

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

single stage, low delivery pressure regulator

Series 3700HP

Description

These regulators were designed to meet the needs of applications requiring reliable low-pressure control while maintaining gas purity. They are available in single and two stage versions to meet most non-corrosive gas applications. The low pressure stage has a large sensitive aluminum-faced neoprene diaphragm to provide delivery pressures as low as 2" of water.

Advanced Features

- Extremely low delivery pressures.
- Knob for adjusting delivery pressure.
- Aluminum faced diaphragm for high purity applications.
- Maximum inlet pressure 250 psig.
- Diaphragm packless valve on outlet is standard.

Typical Applications

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.

Materials

Body & Bonnet
Zinc

Seat
Nitrile

Diaphragm
Aluminum-faced natural rubber

Internal parts
Steel, brass and zinc

Specifications

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

Protocol Station

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

- *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

Specifications

Gas Block
316 stainless steel, brass or chrome-plated brass barstock

Inlet Connection
316 stainless steel or brass barstock

Check Valve "O" Ring
Viton®

See page 119 for pigtail specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional
6000 PSIG (380 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Weight (Single Stage)
3.1 lbs. (1.4 kg)

Weight (Dual Stage)
3.5 lbs. (1.6 kg)

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 dual 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

Protocol Switchover Station

Description

The 529 Series Protocol Switchover Station combines all of the safety and convenience features of a standard Protocol Station with the added efficiency of having a reserve cylinder connected to the system. The Protocol Switchover Station valving allows manual switching and isolation of the depleted cylinder for safe change-out. The system comes complete with Protocol Station, two 3-foot all stainless steel pigtails with armor casing, and two valves (diaphragm, 3,000 PSIG or needle 4,500 or 6,000 PSIG).

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

Specifications

Protocol Tee
Brass or 316 stainless steel barstock

Flexible Pigtails
316 stainless steel barstock
Monel innercore for oxygen service

Inlet Connection
316 stainless steel or brass barstock

Check Valve "O" Ring
Viton®

Bracket
304 Stainless Steel

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional
6000 PSIG (380 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Weight (Single Stage)
3.6 lbs. (1.4 kg)

Weight (Dual Stage)
4.0 lbs. (1.6 kg)

Ordering Information and Configuration Options

Stock Number	Description
Add letter "C" after any regulator stock number To order separately:	For example, to order a 422-1331-580 with a Protocol Switchover, the stock number would be 422-1331-580C
529-0154-CON	Protocol Switchover Station for brass regulators with max inlet 3,000 PSIG (4,000 PSIG Gauge)
529-0155-CON	Protocol Switchover Station for chrome-plated brass regulators with max inlet 3,000 PSIG (4,000 PSIG Gauge)
529-0156-CON	Protocol Switchover Station for 316L stainless steel regulators with max inlet 3,000 PSIG (4,000 PSIG Gauge)
529-0157-CON	Protocol Switchover Station for brass regulators with max inlet 4,500 PSIG (6,000 PSIG Gauge)
529-0158-CON	Protocol Switchover Station for chrome-plated brass regulators with max inlet 4,500 PSIG (6,000 PSIG Gauge)
529-0159-CON	Protocol Switchover Station for 316L stainless steel regulators with max inlet 4,500 PSIG (6,000 PSIG Gauge)
529-0160-CON	Protocol Switchover Station for 316L stainless steel regulators with max inlet 6,000 PSIG (10,000 PSIG Gauge)

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

Protocol Tee
Brass or 316 stainless steel barstock

Flexible Pigtails
316 stainless steel barstock
Monel innercore for oxygen service

Inlet Connection
316 stainless steel or brass barstock

Check Valve "O" Ring
Viton®

Bracket
304 Stainless Steel

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional
6000 PSIG (380 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Weight (Single Stage)
4.4 lbs. (2 kg)

Weight (Dual Stage)
4.8 lbs. (2.2 kg)

Intrinsic Safety Barriers
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	For example, to order a 422-1331-580 with a 110V Protocol Switchover Alarm, the stock number would be 422-1331-580G
Add letter "H" after any regulator stock number	For example, to order a 422-1331-580 with a 220V Protocol Switchover Alarm, the stock number would be 422-1331-580H
To order separately:	
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
	For 220V Protocol Switchover Alarm replace "G" after Part Number with "H"

PurityPlus™ Specialty Gases

522 Series

Description

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. Internal pressure switches, warning lights, and remote alarm indicate low bank pressure.

Advanced Features

- 400 Series Brass System Components
  Capsule® seat
- Metal to metal seals
  No possibility of gas contamination
- Integral Line Regulator
  Stable line pressure during change over
- Variable Line Pressure
  Line pressure changeable on site
- User-Friendly Priority Valve
  One knob switches cylinder priority
- Integral Manifold System
  Easy installation

Remote Alarm

Providing audible and visible notification of cylinder depletion, one Advantium 8 remote alarm can monitor and power up to four switchover stations.

Intrinsic Safety Barriers
Safe use with flammable gases or in hazardous areas (class 1, division 1, group A, B, C or D)

Relay Output
Easy integration with other alarm systems

Telephone Dialer
Notify multiple off-site locations of the need to change depleted cylinders

Computer Interface
Serial communication through RS-232 port

Materials

Priority Valve
Brass barstock

Line Regulator
Brass barstock

Diaphragms
316L stainless steel

Enclosure
Acrylic powder-coated steel

Tubing and Fittings
316 stainless steel

Internal Seats and Seals
PTFE

Pressure Gauges and Switches
Brass, Bronze and Stainless Steel

Check Valves
Brass with Viton® seals

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Maximum Flow (100 PSIG)
600 scfh (283 lpm)

Inlet Connection
½" FPT

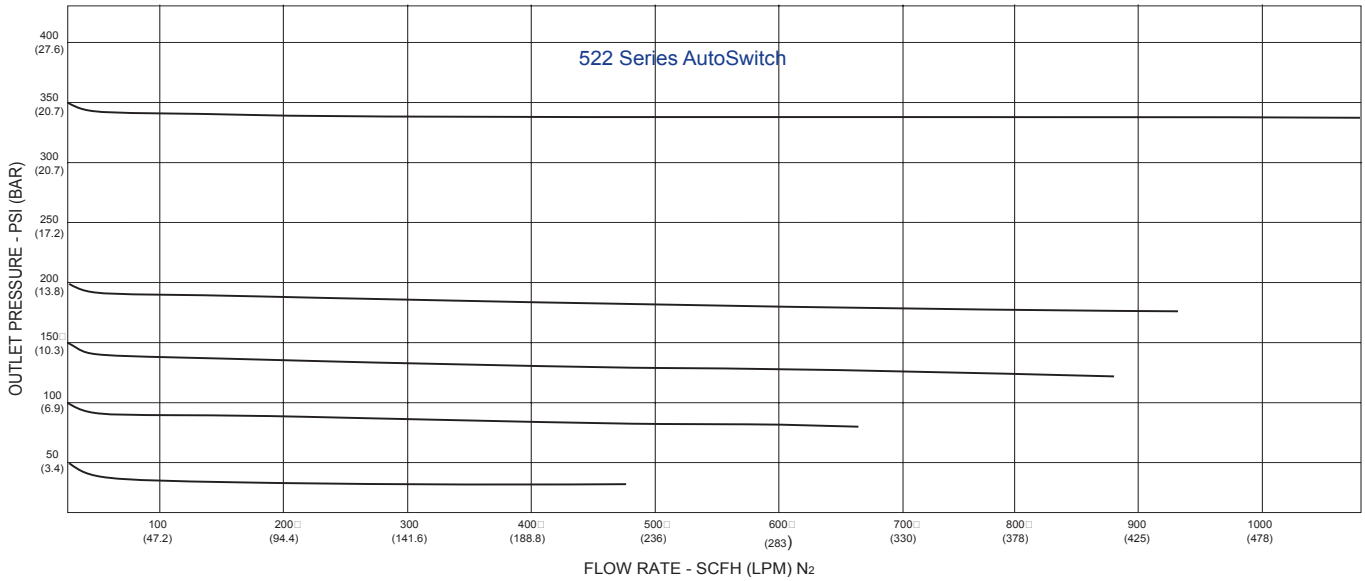
Outlet Connection
¼" stainless steel compression tube

Helium Leak Integrity
1 x 10^{-8} scc/sec

Weight
40 lbs. (18 kg)

See page 26 for manifold specifications

Flow Performance



Ordering Information and Configuration Options

522	A	B	C	D	-Inlet
Series 522	**Outlet Pressure** **2:** 0-50 PSIG **3:** 0-100 PSIG **4:** 0-200 PSIG **5:** 0-350 PSIG **7:** 0-150 PSIG	**Inlet Connection** **0:** ½" FPT **1:** Brass Manifolds (36" flexible pigtails at each station) **3:** Diaphragm Valves* (Two 36" stainless flexible pigtails) **4:** Brass Manifolds (24" flexible pigtails at each station) **5:** Chrome-Plated Brass Manifolds (36" flexible pigtails at each station) **6:** ½" FPT with captured vent **7:** Chrome-Plated Brass Manifolds (24" flexible pigtails at each station) **9:** Diaphragm Valves* (Two 72" stainless steel pigtails) **One cylinder/side only*	**Cylinders/Side** **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 ** If manifold option is selected in B, 0 = Ten Cylinders*	**Assembly** **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.*	**Pigtail** Please specify inlet connection (if applicable) CGA DIN 477 BS 341 and others available
Related Options	See Pages 24 and 25 for Alarm Options				

523 Series

Description

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.

Advanced Features

- 400 Series 316L Stainless Components
  Capsule® seat
- Metal to metal seals
  No possibility of gas contamination
- Integral Line Regulator
  Stable line pressure during change over
- Variable Line Pressure
  Line pressure changeable on site
- User-Friendly Priority Valve
  One knob switches cylinder priority
- Integral Manifold System
  Easy installation

Remote Alarm

Providing audible and visible notification of cylinder depletion, one Advantium 8 remote alarm can monitor and power up to four switchover stations.

Intrinsic Safety Barriers
Safe use with flammable gases or in hazardous areas (class 1, division 1, group A, B, C or D)

Relay Output
Easy integration with other alarm systems

Telephone Dialer
Notify multiple off-site locations of the need to change depleted cylinders

Computer Interface
Serial communication through RS-232 port

Materials

Priority Valve
316L stainless steel barstock

Line Regulator
316L stainless steel barstock

Diaphragms
316L stainless steel

Enclosure
Acrylic powder-coated steel

Tubing and Fittings
316 stainless steel

Internal Seats and Seals
PTFE

Pressure Gauges and Switches
316 stainless steel

Check Valves
316 stainless steel with Viton® seal

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Maximum Flow (100 PSIG)
600 scfh (283 lpm)

Inlet Connection
½" FPT

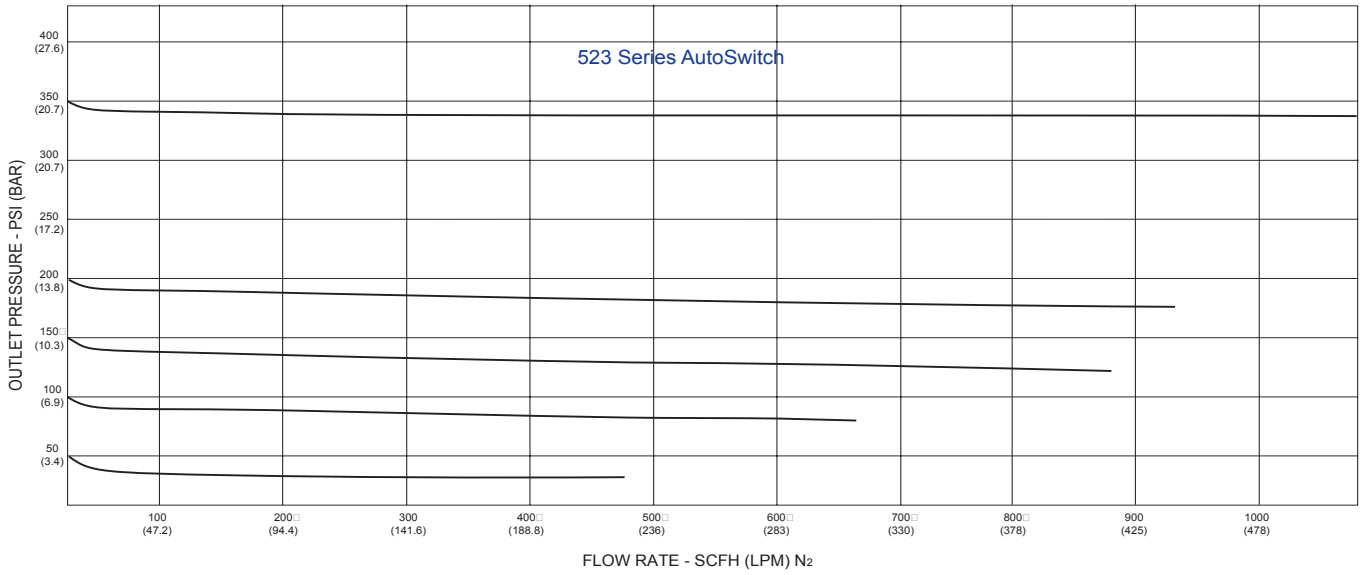
Outlet Connection
¼" stainless steel compression tube

Helium Leak Integrity
1 x 10^{-8} scc/sec

Weight
40 lbs. (18 kg)

See page 26 for manifold specifications

Flow Performance



Ordering Information and Configuration Options

523	A	B	C	D	-Inlet
Series 523	**Outlet Pressure** **2:** 0-50 PSIG **3:** 0-100 PSIG **4:** 0-200 PSIG **5:** 0-350 PSIG **7:** 0-150 PSIG	**Inlet Connection** **0:** ½" 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:** ½" 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*	**Cylinders/Side** **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	**Assembly** **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.*	**Pigtail** Please specify inlet connection (if applicable) CGA DIN 477 BS 341 and others available
Related Options	See Pages 24 and 25 for Alarm Options				

PurityPlus™ Specialty Gases

536 Series

Description

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.

Advanced Features

- Integral Line Regulator
  Stable line pressure during change over
- 400 Series Brass System Components
  Capsule® seat
- Metal to metal seals
  No possibility of gas contamination
- Variable Line Pressure
  Line pressure changeable on site
- Preset Switching Pressure
  Prevents tampering or adjustment
- Integral Manifold System
  Easy installation

Remote Alarm

Providing audible and visible notification of cylinder depletion, one Advantium 8 remote alarm can monitor and power up to four switchover stations.

Intrinsic Safety Barriers
Safe use with flammable gases or in hazardous areas (class 1, division 1, group A, B, C or D)

Relay Output
Easy integration with other alarm systems

Telephone Dialer
Notify multiple off-site locations of the need to change depleted cylinders

Computer Interface
Serial communication through RS-232 port

Materials

Priority Valve
Brass barstock

Line Regulator
Brass barstock

Diaphragms
316L stainless steel

Enclosure
Acrylic powder-coated steel

Tubing and Fittings
316 stainless steel

Internal Seats and Seals
PTFE

Pressure Gauges and Switches
Brass, bronze and stainless steel

Check Valves
Brass with Viton® seals

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Maximum Flow (100 PSIG)
600 scfh (283 lpm)

Inlet Connection
½" FPT

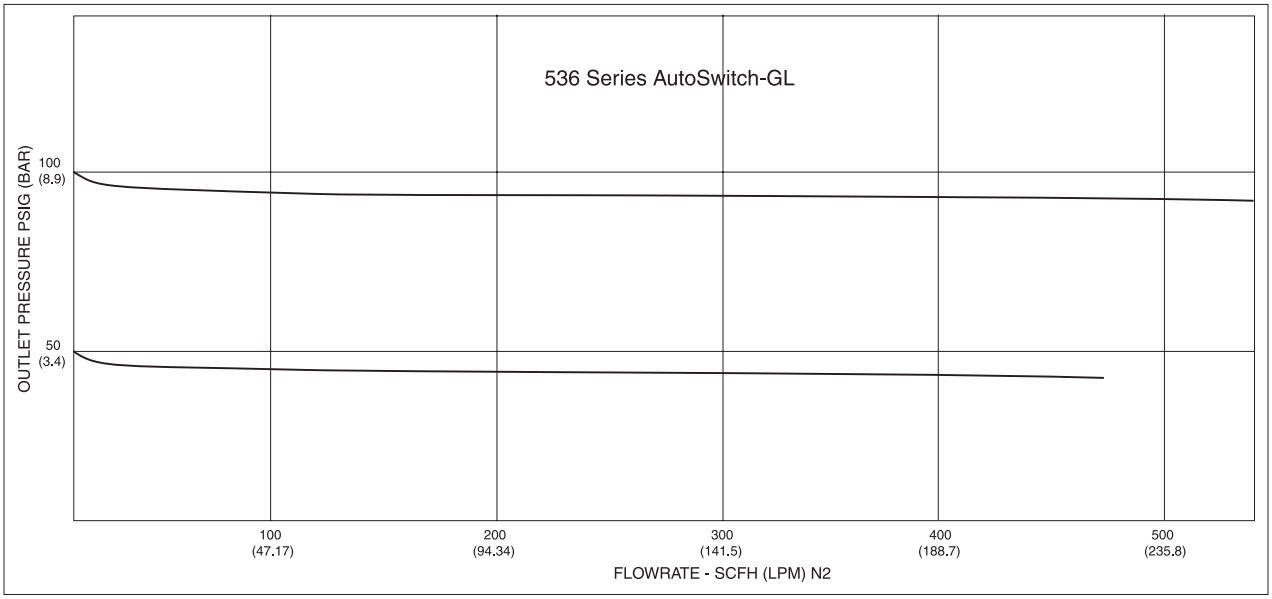
Outlet Connection
¼" stainless steel compression tube

Helium Leak Integrity
1 x 10^{-8} scc/sec

Weight
40 lbs. (18 kg)

See page 26 for manifold specifications

Flow Performance



Ordering Information and Configuration Options

536	A	B	C	D	-Inlet
Series 536	**Outlet Pressure** **2:** 0-50 PSIG **3:** 0-100 PSIG	**Liquid Cylinders (Primary)** **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*	**High Pressure (Reserve)** **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*	**Assembly** **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.*	**Pigtail** Please specify inlet connection (If applicable). CGA DIN 477 BS 341 and others available
Related Options	See Pages 24 and 25 for Alarm Options				

PurityPlus™ Specialty Gases

537 Series

Description

The 537 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.

Advanced Features

- 400 Series 316L Stainless Components
  Capsule® seat
- Metal to metal seals
  No possibility of gas contamination
- Integral Line Regulator
  Stable line pressure during change over

- Variable Line Pressure
  Line pressure changeable on site
- Preset Switching Pressure
  Prevents tampering or adjustment
- Integral Manifold System
  Easy installation

Remote Alarm

Providing audible and visible notification of cylinder depletion, one Advantium 8 remote alarm can monitor and power up to four switchover stations.

Intrinsic Safety Barriers
Safe use with flammable gases or in hazardous areas (class 1, division 1, group A, B, C or D)

Relay Output
Easy integration with other alarm systems

Telephone Dialer
Notify multiple off-site locations of the need to change depleted cylinders

Computer Interface
Serial communication through RS-232 port

Materials

Priority Valve
316L stainless steel barstock

Line Regulator
316L stainless steel barstock

Diaphragms
316L stainless steel

Enclosure
Acrylic powder-coated steel

Tubing and Fittings
316 stainless steel

Internal Seats and Seals
PTFE

Pressure Gauges and Switches
316 stainless steel

Check Valves
316 stainless steel with Viton® seal

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Maximum Flow (100 PSIG)
400 scfh (190 lpm)

Inlet Connection
½" FPT

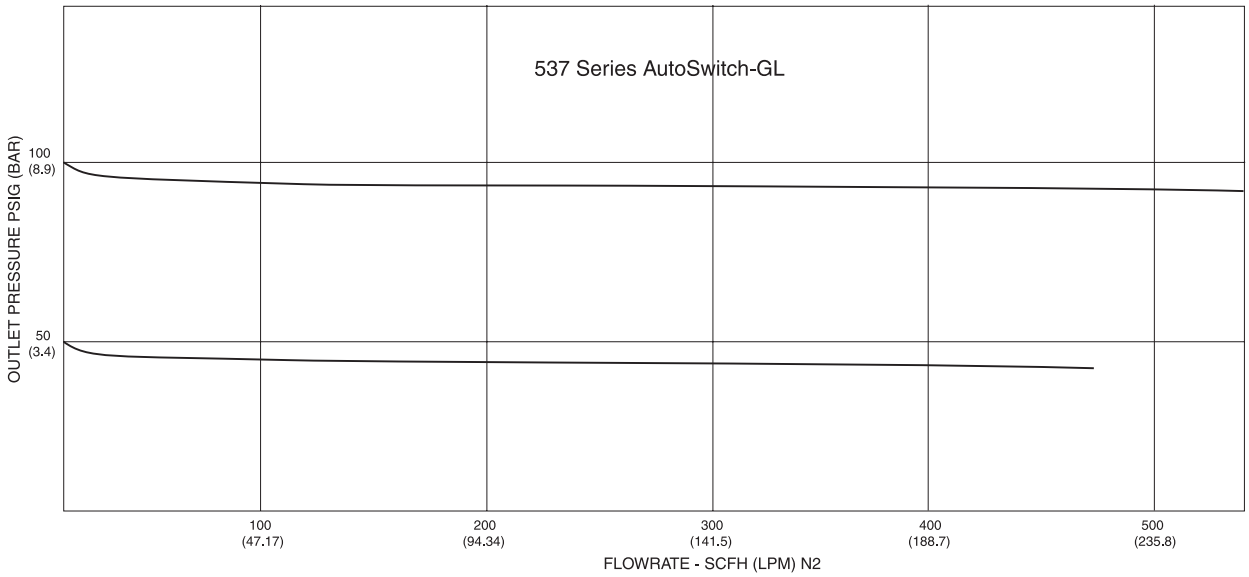
Outlet Connection
¼" stainless steel compression tube

Helium Leak Integrity
1 x 10^{-8} scc/sec

Weight
40 lbs. (18 kg)

See page 26 for manifold specifications

Flow Performance



Ordering Information and Configuration Options

537	A	B	C	D	-Inlet
Series 537	**Outlet Pressure** **2:** 0-50 PSIG **3:** 0-100 PSIG	**Liquid Cylinders (Primary)** **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*	**High Pressure (Reserve)** **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 24" flexible pigtail, manifold extensions and mounting hardware*	**Assembly** **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.*	**Pigtail** Please specify inlet connection (if applicable) CGA DIN 477 BS 341 and others available
Related Options	See Pages 24 and 25 for Alarm Options				

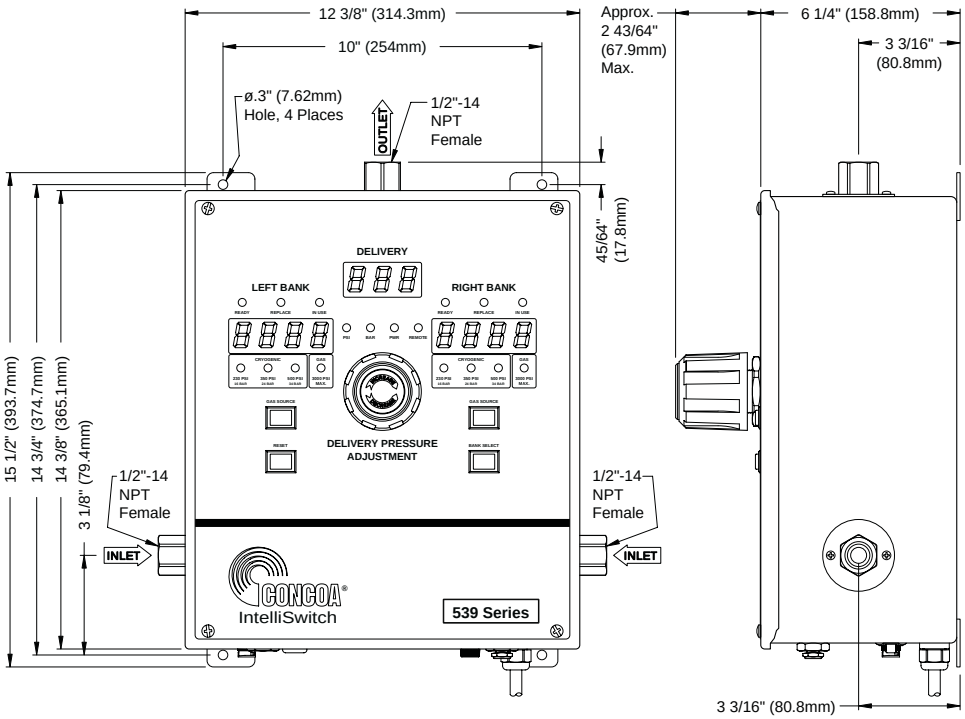
PurityPlus™ Specialty Gases

539 Series

Description	Advanced Features	
The IntelliSwitch electronic switchover provides continuous gas supply from liquid cylinders, high pressure cylinders, or a combination of the two allowing the end-user to select the most economical mode of gas supply. Microprocessor control lowers yearly gas cost by eliminating liquid cylinder vent loss and excess residual return, making the IntelliSwitch the perfect choice for laboratory, pilot plant or process applications.	• Microprocessor Control Fully automatic priority assignment • Field Adjustable Parameters Enables process flexibility • On-Site Source Selection Liquid cylinder or high-pressure service • Low Loss Technology Reduces residual return	• Electronic Economizer Eliminates vent loss from 230, 350 or 500 PSIG liquid cylinders • Process Gas or Air Actuated Pilot Valves Simple installation • RS 232 or 485 Communications Provides remote monitoring of supply

Low Loss Principle	Materials	Specifications
The Low Loss Principle consists of two features, the Look-Back and the Economizer. When the IntelliSwitch electronics sense that the primary bank pressure is low, it automatically switches to the reserve bank. After a period of time, the system looks back at the depleted source to sense if it has rebuilt pressure. If it has, the system switches back and continues to draw product from this source, eliminating false switchovers and reducing residual return. The Electronic Economizer has selectable settings for 230, 350 & 500 PSIG liquid cylinders. The IntelliSwitch continuously monitors the pressure in the reserve bank. When the pressure goes above the Economizer setting, the IntelliSwitch will draw gas from the headspace of the reserve bank, preventing vent losses.	*Regulator and Valve Bodies* Brass barstock *Valve Stems* 316L stainless steel *Valve Seats* PCTFE *Seals* PTFE, PCTFE and Viton® *Enclosure* Powder-coated steel	*Power Requirements* 110 or 220 VAC *Maximum Inlet Pressure* 3,000 PSIG (210 BAR) *Temperature Range* 0°F to 140°F (-18°C to 60°C) *Flow Capacity* Cv = 1.0 *Filter* 40-micron *Inlet Connection* ½" FPT *Outlet Connection* ½" FPT *Weight* 67 lbs. (30.4 kg)

Installation Dimensions

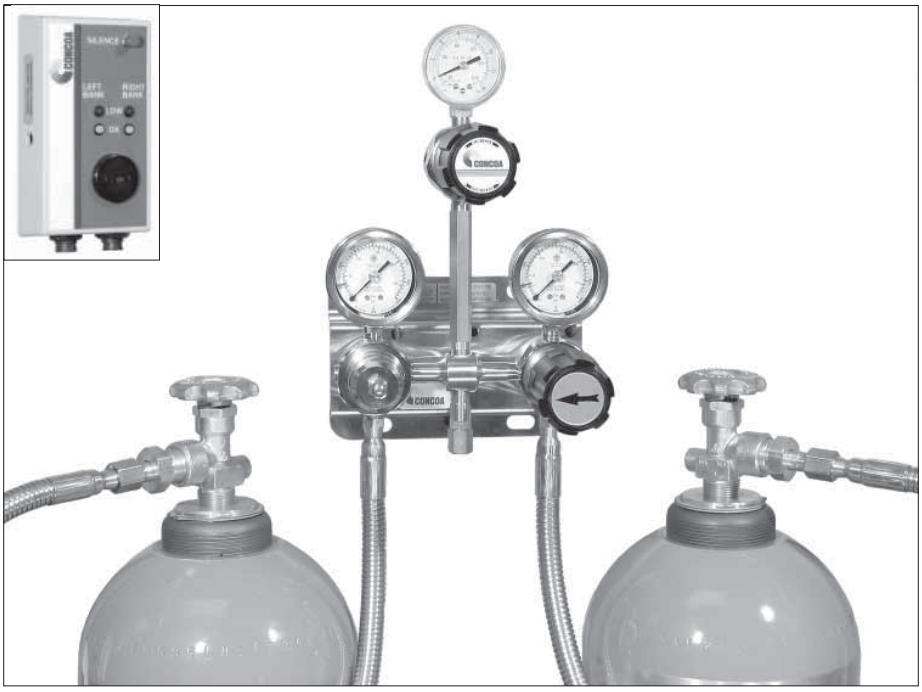


Ordering Information and Configuration Options

539	A	B	C	D	-Inlet
Series 539	**Outlet Pressure** **2:** 0-50 PSIG **3:** 0-100 PSIG **4:** 0-150 PSIG **5:** 0-200 PSIG	**Right Side Connection** **0:** ½" FPT **1:** Diaphragm Valve with 36" stainless flexible pigtail **2:** Diaphragm Valve with 72" stainless flexible pigtail **3:** Manifold Connector	**Left Side Connection** **0:** ½" FPT **1:** Diaphragm Valve with 36" stainless flexible pigtail **2:** Diaphragm Valve with 72" stainless flexible pigtail **3:** Manifold Connector	**Assembly** **0:** 110 VAC External Pilot **1:** 220 VAC External Pilot **2:** 110 VAC Internal Pilot **3:** 220 VAC Internal Pilot	**Pigtail** Please specify inlet connection (if applicable) CGA DIN 477 BS 341 and others available
Related Options	See Pages 24 and 25 for Alarm Options				

PurityPlus™ Specialty Gases

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 pigtails 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.

Features

- *400 Series brass barstock regulators*
  Capsule® seat
- *Metal-to-metal diaphragm seal*
  No possibility of gas contamination
- *User-Friendly*
  One knob switches cylinder priority
- *Check valves in pigtail inlet glands*
  Prevents contamination and back flow
- *Compatible with Maniflex Manifolds*
  Multiple cylinders per side
- *Optional Line Regulator*
  Stable line pressure during change over

Materials

Bodies
Brass barstock

Diaphragms
316L stainless steel

Seats
PTFE
PCTFE with 4500 PSIG inlet

Filters
10 micron sintered bronze

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2” diameter brass

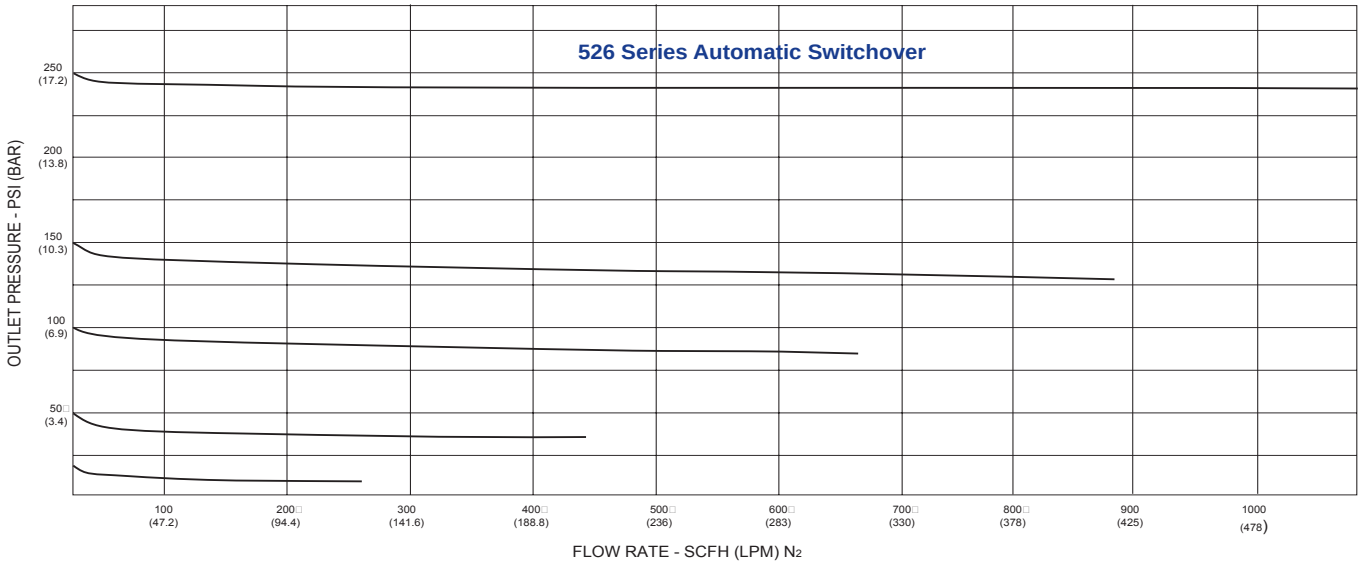
Outlet Connection
¼” MPT (without line regulator)
¼” FPT (with line regulator)

Helium Leak Integrity
1 x 10^{-8} scc/sec

Cv
0.1

Weight
8.25 lbs. (3.71 kg)

Flow Performance



Ordering Information and Configuration Options

526	A	B	C	D	-Inlet
Series 526	**Switching Pressure (Priority Right/Left)** **1:** 125 PSIG/105 PSIG* **2:** 70 PSIG/50 PSIG* **3:** 100 PSIG/75 PSIG **4:** 200 PSIG/170 PSIG **5:** 500 PSIG/470 PSIG **7:** 150 PSIG/130 PSIG **8:** 300 PSIG/270 PSIG **Not available with 4500 PSIG inlet*	**Inlet Connections** **0:** ¼" FPT Ports **1:** Flexible Stainless Steel Pigtails (36") **2:** Manifold Connectors* **3:** Flexible Stainless Steel Pigtails (24") **4:** Diaphragm Valves with ¼" FPT Port **5:** Diaphragm Valves with Pigtails (36") **6:** Diaphragm Valves with Manifold Connectors* **7:** Diaphragm Valves with Pigtails (24") **8:** Flexible PTFE-lined Pigtails (36") (4500 PSIG maximum inlet pressure) **A:** Flexible Stainless Steel Pigtails (36") with Flashback Arrestor for Acetylene	**Line Regulator** **0:** None **1:** 0-15 PSIG **2:** 0-50 PSIG **3:** 0-100 PSIG **4:** 0-250 PSIG **5:** 0-400 PSIG **7:** 0-150 PSIG **A:** 0-15 PSIG Redline for Acetylene	**Assembly/Gauges** **1:** 0-4000 PSI/kPa Gauges* No alarm capability **2:** 0-4000 BAR/PSI Gauges* No alarm capability **3:** 0-4000 BAR/PSI* with Pressure Switches and 110V Remote Alarm **4:** 0-4000 BAR/PSI* with Pressure Switches and 220V Remote Alarm **5:** 0-600 BAR/PSI Gauges No alarm capability **6:** 0-600 BAR/PSI with Pressure Switches and 110V Remote Alarm **7:** 0-600 BAR/PSI with Pressure Switches and 220V Remote Alarm **8:** 0-4000 BAR/PSI* with Pressure Switches and without Remote Alarm **0-6000 PSI gauges with 4500 PSIG maximum inlet option*	**Pigtail** Please specify inlet connection (if applicable) CGA DIN 477 BS 341 and others available

PurityPlus™ Specialty Gases

527 Series

Description

The 527 Series Switchover is an automatic switchover system designed to supply a continuous supply of high purity, corrosive gas. The system comes with either flexible pigtails 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.

Features

- 400 Series stainless steel regulators
  Capsule® seat
- Metal-to-metal diaphragm seal
  No possibility of gas contamination
- User-Friendly Priority Valve
  One knob switches cylinder priority
- Check valves in inlet gland
  Prevents contamination and back flow.
- Compatible with Maniflex Manifolds
  Multiple cylinders per side
- Optional Line Regulator
  Stable line pressure during change over

Materials

Bodies
316L stainless steel barstock

Diaphragms
316L stainless steel

Seats
PTFE
PCTFE with 4500 PSIG inlet

Filters
10 micron sintered stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2” diameter stainless steel

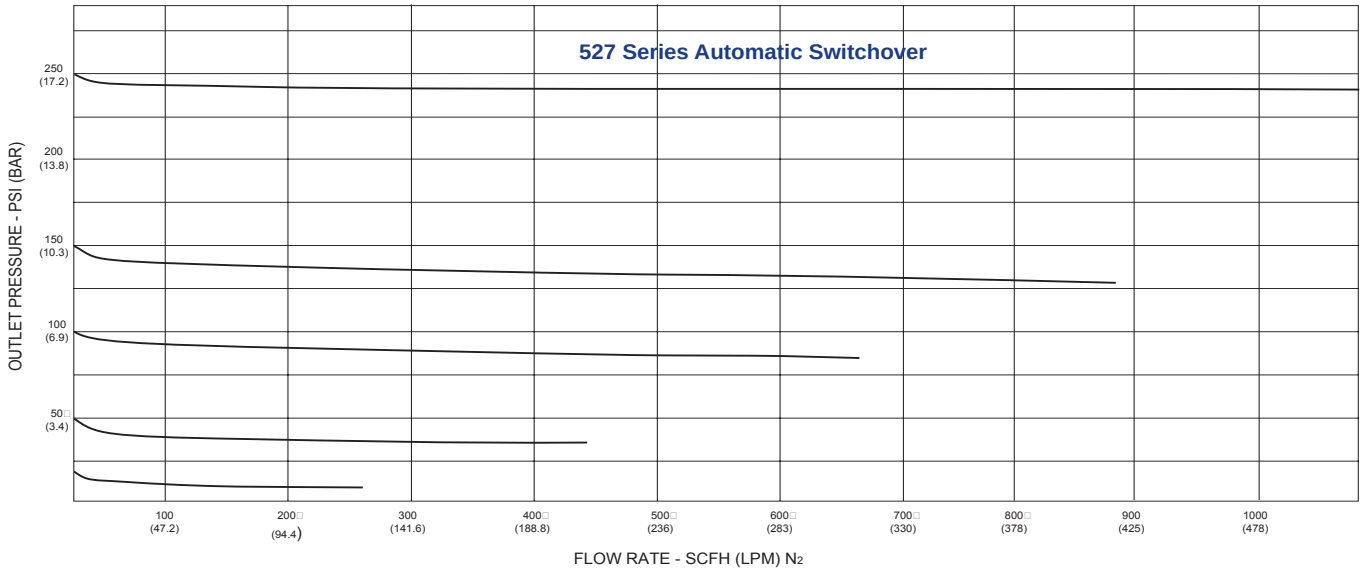
Outlet Connection
¼” MPT (without line regulator)
¼” FPT (with line regulator)

Helium Leak Integrity
1×10^{-8} scc/sec

Cv
0.1

Weight
8.25 lbs. (3.71 kg)

Flow Performance



Ordering Information and Configuration Options

527	A	B	C	D	-CON
Series 527	**Switching Pressure (Priority Right/Left)** **1:** 125 PSIG/105 PSIG* **2:** 70 PSIG/50 PSIG* **3:** 100 PSIG/75 PSIG **4:** 200 PSIG/170 PSIG **5:** 500 PSIG/470 PSIG **7:** 150 PSIG/130 PSIG **8:** 300 PSIG/270 PSIG **Not available with 4500 PSIG inlet*	**Inlet Connections** **0:** ¼" FPT Ports **1:** Flexible Stainless Steel Pigtails (36") **2:** Manifold Connectors* **3:** Flexible Stainless Steel Pigtails (24") **4:** Diaphragm Valves with ¼" FPT Port **5:** Diaphragm Valves with Pigtails (36") **6:** Diaphragm Valves with Manifold Connectors* **7:** Diaphragm Valves with Pigtails (24") **8:** Flexible PTFE-lined Pigtails (36") (4500 PSIG maximum inlet pressure) **See page 26 for manifold ordering information*	**Line Regulator** **0:** None **1:** 0-15 PSIG **2:** 0-50 PSIG **3:** 0-100 PSIG **4:** 0-250 PSIG **5:** 0-400 PSIG **7:** 0-150 PSIG	**Assembly/Gauges** **1:** 0-4000 PSI/kPa Gauges No alarm capability **2:** 0-4000 BAR/PSI Gauges No alarm capability **3:** 0-4000 BAR/PSI with Pressure Switches and 110V Remote Alarm **4:** 0-4000 BAR/PSI with Pressure Switches and 220V Remote Alarm **5:** 0-600 BAR/PSI Gauges No alarm capability **6:** 0-600 BAR/PSI with Pressure Switches and 110V Remote Alarm **7:** 0-600 BAR/PSI with Pressure Switches and 220V Remote Alarm **8:** 0-4000 BAR/PSI with Pressure Switches and without Remote Alarm	**Pigtail** Please specify inlet connection (if applicable) CGA DIN 477 BS 341 and others available

Advantium 8 Alarm

Description

Designed for use with all CONCOA automatic switchover systems, the new Advantium Series offers superior integration, protection, and convenience by allowing end-users to monitor normally open or closed contact devices with a single flip of a switch. Systems can be configured for inert or flammable gases utilizing CONCOA's innovative intrinsic safety barriers, allowing end-users to safely monitor flammable gas cylinder contents via a remote alarm on a CONCOA switchover or Protocol station.

Features

- *High profile visible and audible notification*
- *Audible alarm silence function*
- *Thirteen input and output channels*
  Eight input and five output
- *Dry contact relay output*
  Four discrete or one general
- *RS232 data interface capability*
- *NO or NC switch compatibility*
- *Auto-reset when cylinders are replenished*
- *Custom configure one to four systems*

Specifications

Sound
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

RS232 Serial Port
No parity
9600 baud rate

Dimensions
9.59" x 5.48" x 2.95"

Power Fuses
.5A normal blow, type 3AG, 120 VAC
.25A normal blow, type 3AG, 220 VAC

System Fuses
Internal resettable poly-fuse

Connections
Input connector (D25)
Relay output connector (D15)
RS232 serial output connector (D9)

Ordering Information and Configuration Options

Part Number	Description
529-5310	Multi-Station Remote Alarm (120V)
529-5311	Multi-Station Remote Alarm (220V)
529-5312	Intrinsic Safety Barriers for 526 or 527 Series Switchover Systems (required for flammable gas or hazardous environments)
529-5296	Intrinsic Safety Barriers for 522, 523, 536 or 537 Series AutoSwitch Systems (required for flammable gas or hazardous environments)
529-5306	AD2000 Telemetry Auto-dialer for 529-5310 and 529-5311 Alarms
529-5390	RS232 Advantium Monitoring Software
	Contact CONCOA for pre-made patch cables

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 ¼" 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

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*

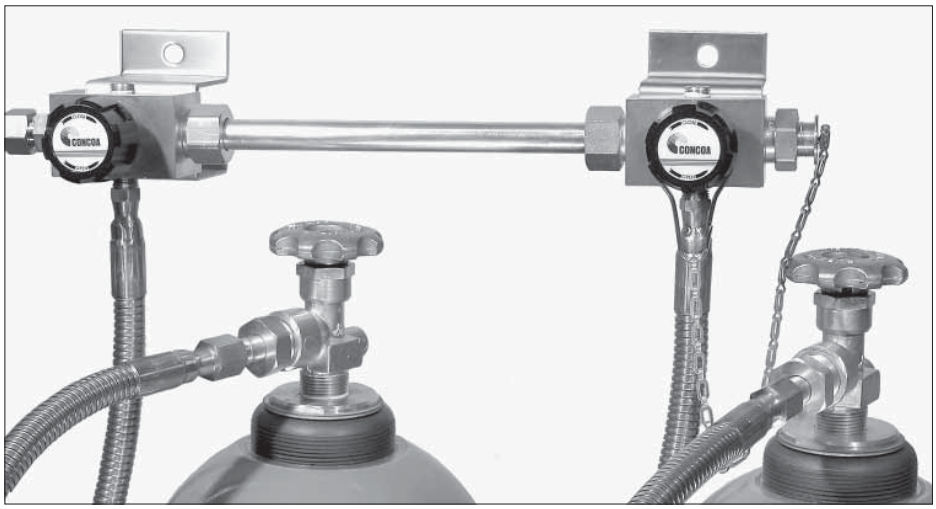
Specifications

- *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 ¼" 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

52 Series



Description

The 52B, 52C and 52S series Maniflex are modular gas distribution systems that may be connected to regulators, dual regulator switchovers, 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.

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F

Header
0.625 OD x 0.188 wall (Brass)
0.625 OD x 0.095 wall (Stainless)

Diaphragm Valve
Brass or stainless steel barstock (Body)
PCTFE (Seat)
303/304 stainless steel (Stems)
Elgiloy® (Diaphragms)

Advanced Features

- Modular Design
  Flexible field installation
- Integral Diaphragm Valves
  Leak-tight integrity
  Independent shut-off capability
- Expandable System
  Future growth capability
- Brass, Chrome-Plated Brass or Stainless Steel
  No possibility of gas contamination
- Metal to Metal Field-Assembled Joints
  Easy leak-tight field assembly
  Ease of transportation
- Silver-Brazed or TIG Welded Connectors
  Contamination-free installation

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)	17.891"	29.891"	41.891"	53.891"	65.891"	77.891"	89.891"	101.89"	113.89"	125.89"
"C" Standard (Single Row)	35.781"	59.781"	83.781"	107.78"	131.78"	155.78"	179.78"	203.78"	227.78"	251.78"
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)	17.891"	23.891"	29.891"	35.891"	41.891"	47.891"	53.891"	59.891"	65.891"	71.891"
"C" Compact (Single Row)	35.781"	47.781"	59.781"	71.781"	83.781"	95.781"	107.78"	119.78"	131.78"	143.78"
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 and Configuration Options

52X	A	B	C	D	-CON
Series 52B Brass 52C Chrome-Plated Brass 52S Stainless Steel	**Orientation** **1**: Standard Single Row (right or left) (one cylinder/station) **2**: Standard Double Row (right or left) (two cylinders/stations) **3**: Standard Single Duplex (right and left) (one cylinder/station) **4**: Compact Single Row (right or left) (one cylinder/station) **5**: Compact Double Row (right or left) (two cylinders/stations) **6**: Compact Single Duplex (right and left) (one cylinder/station)	**Stations** **0**: 10 stations **1**: 1 stations **2**: 2 stations **3**: 3 stations **4**: 4 stations **5**: 5 stations **6**: 6 stations **7**: 7 stations **8**: 8 stations **9**: 9 stations **A**: 11 stations **B**: 12 stations **C**: 13 stations **D**: 14 stations **E**: 15 stations	**Pigtail Style** **0**: None **2**: 24" Flexible 316 Stainless Steel with Check Valve **3**: 36" Flexible 316 Stainless Steel with Check Valve **6**: 72" Flexible 316 Stainless Steel with Check Valve	**Outlet Connection** **1**: ¼" FPT Connection **2**: Cylinder Connection Adapter	**Pigtail Connection** CGA DIN 477 BS 341 and others available

Leak-Tector™ Testing Solution

Description	Specifications
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. 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 1.16 x 10-4cc/sec of nitrogen.	*Temperature range* +35° to +160°F *Meets Air Force Spec.* MIL-L-25567

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

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.

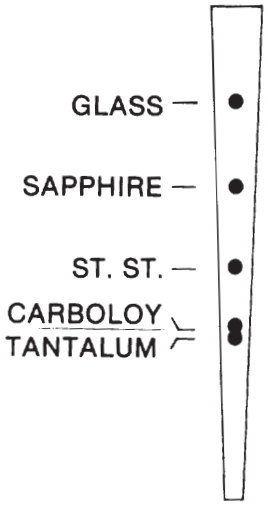


Figure 1
Relative positions of floats of various densities for the same rate of flow with 1 atmosphere outlet pressure.

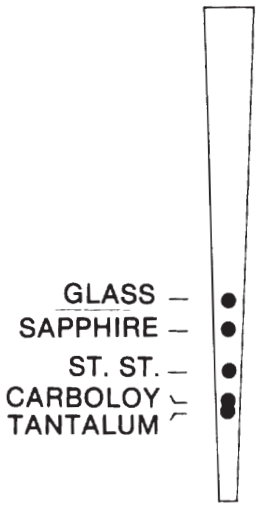


Figure 2
Effect of float position for the same rate of flow in Figure 1, but with increased pressure at the flowmeter outlet.

Series 7920

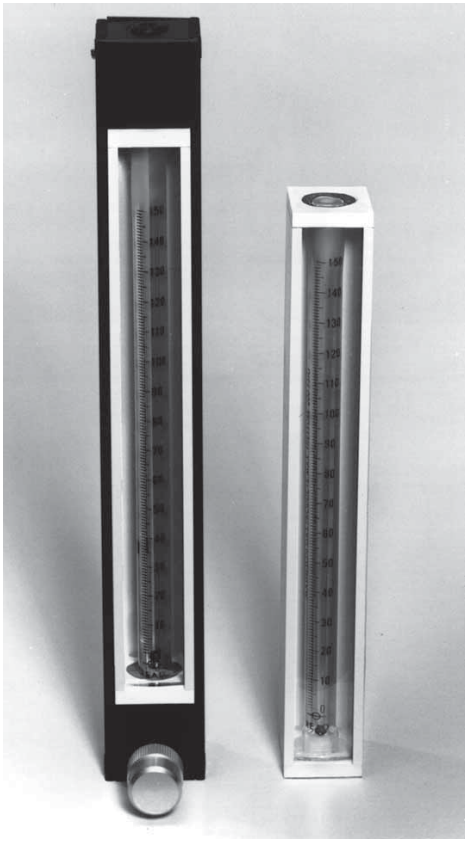
Flowmeter

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 ±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
±5% of full scale

Repeatability
±0.25% of scale reading

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.

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
Bench stand - Model 7920B	
Eagle Eye Alarm - Model 7926-AVA* (Requires special modified unit - add prefix "EE" to model number)	

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.

Flowmeter Tubes in TUBE-CUBE®

Model	Typical Flow Range*		
	Float	Air scc/min.	Water cc./min.
7920-1	Glass St. Steel	3 - 56 11 - 158	0.04 - 0.66 0.12 - 3.18
7920-2	Glass St. Steel	6 - 91 16 - 271	0.08 - 1.0 0.17 - 5.5
7920-3	Glass St. Steel	22 - 388 63 - 845	0.24 - 7.8 0.68 - 17
7920-4	Glass St. Steel	64 - 847 217 - 1707	1 - 17 2 - 46
7920-5	Glass St. Steel	550 - 2560 1070 - 5080	6 - 54 21 - 135
7920-6	Glass St. Steel	610 - 3830 1330 - 7670	9 - 89 30 - 217
7920-7	Glass St. Steel	820 - 8610 2090 - 16580	14 - 200 53 - 482
7920-8	Glass St. Steel	2220 - 24920 4190 - 45940	47 - 568 102 - 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

PurityPlus™ Specialty Gases

Series 7950

Gas Proportioner

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.

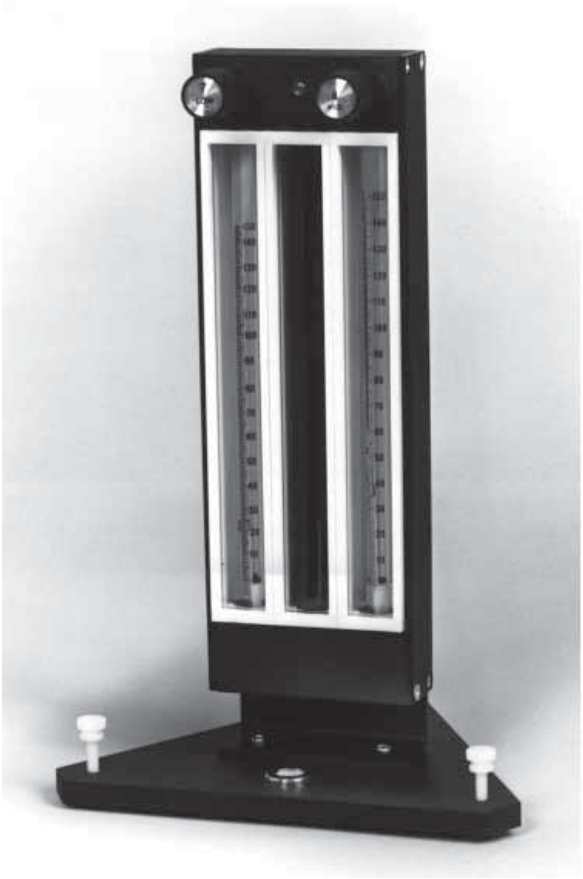
The unit is recommended for 50 psig pressure but can be used at any pressure between 10 and 200 psi.*

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

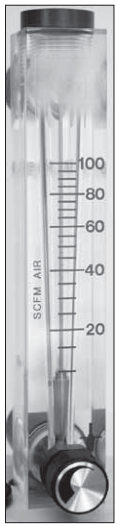
Large Flow Acrylic Flowmeters

Series 7974 & 7975

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

- Easy to read scales.
- Air ranges from 14 lpm to 3400 lpm (0.5 to 100 scfm)
- Durable one-piece clear acrylic construction
- Optional built-in cartridge type valve available

Materials

Body
clear acrylic

Fittings
7974 series - brass
7975 series - PVC

Valve
brass

Seals
Buna-N

Specifications

Max. Operating Pressure
100 psig

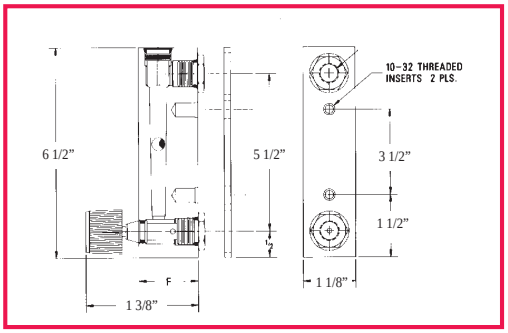
Operating Temperature Range
0° to +150°F

Body Inlet and Outlet
7974 - 1/4" NPT female
7975 - 1" NPT female

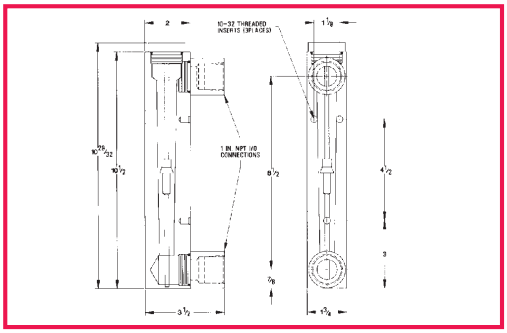
Accuracy
7974 Series - +3% of full scale
7975 Series - +2% of full scale

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

PurityPlus™ Specialty Gases

Series 7923

Economic Acrylic Flowmeter

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

Mass Flow Controllers

Series 810C Mass-Trak

Description

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.

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.

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.

How It Works

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.

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.

Materials

Wetted materials are
10% glass-filled nylon 6/6
316 stainless steel
430F stainless steel
nickel plating
Viton o-rings

Specifications

Accuracy
+1.5% of full scale

Repeatability
+0.25% of full scale

Gas and ambient temperature
32 to 120°F

Gas pressure
20 psig optimum, 150 psig max.

Leak integrity
1 x 10-4 ATM cc/sec of helium

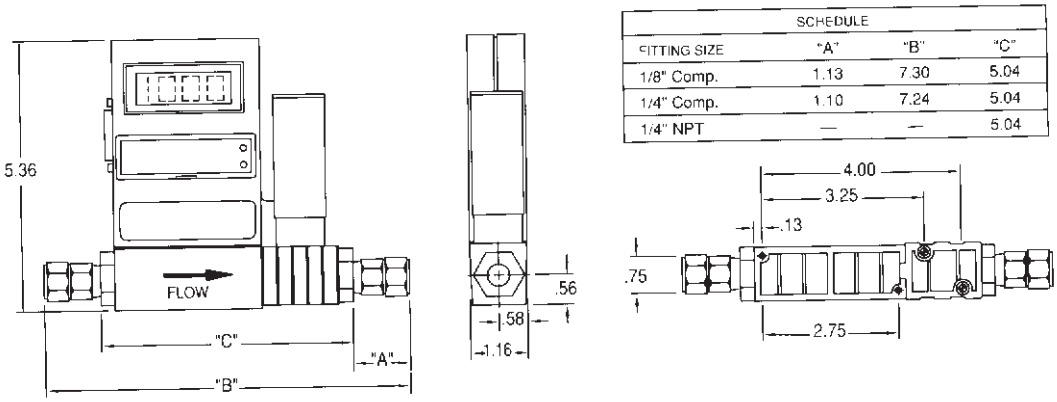
Control range
calibrated for 10 to 100% of full scale

Output signal
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)

Response time
1 second

Series 810C Mass-Trak

Mass Flow Controllers



SCHEDULE			
FITTING SIZE	"A"	"B"	"C"
1/8" Comp.	1.13	7.30	5.04
1/4" Comp.	1.10	7.24	5.04
1/4" NPT	—	—	5.04

Series 810C Dimensional Drawing

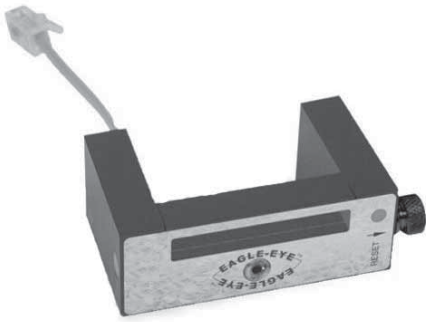
Ordering Information

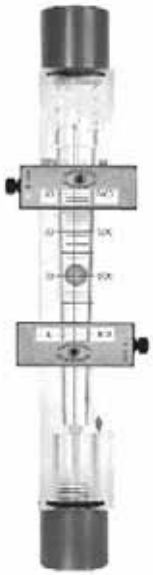
P/N 810C-DR-W-X-Y-Z
(Select X, Y, and Z parameters from table below)

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	All flows are based on standard conditions of 70°F and 1 ATM unless otherwise specified when ordering.
Z = factory set output option:	V = 0-5 VDC A = 4-20 mA	

Eagle-Eye™ Flowmeter Alarm

Series 7900





Description	Advanced Features	Specifications
The Eagle-Eye alarm is a non-contact sensor designed to alert the user when flow rates exceed defined thresholds. The Eagle-Eye alarm has read and green LED visual indicators and an audible buzzer indicator to provide flow rate status. A single unit can indicate either increased flow rate or decreased flow rate. The use of two units on a single flowmeter can provide both increasing and decreasing flow rates. The Eagle-Eye is easily attached to any acrylic flowmeter of the 7923, 7974 or 7975 Series flowmeters.	• Integral red and green LED indicators and an audible buzzer provide operating status. • Field installable while flowmeter is in service • Non-contact sensor is not affected by the fluid in the flow stream • Multiple operating modes 1. Standard - unit will alarm until reset by the user 2. Automatic reset - unit will alarm until flow returns to acceptable levels. • Multiple units may be installed on a single flowmeter to provide both high and low level alarms • Rugged splash resistant enclosure • Advance power supply provides a low level digital output representing the operating status	*Body Material* ABS *Spacer Material* SBR *Operating temperature range* 32° to 160°F *Buzzer volume* 90 dB *Supply voltage* 5VDC regulated *Supply current* 250 mA

Ordering Information

Model	Description
7923-AVA	for use with 7923 series acrylic flowmeters
7926-AVA*	for use with 7920 and 7965 series
7974-AVA	for use with 7974 series acrylic flowmeters
7975-AVA	for use with 7975 series acrylic flowmeters
7920-PS	basic power supply for all models
7920-APS	advanced power supply with battery backup and 0-5 VDC logic output for all models

* This unit can only be used on units with special side plates and Tube Cube assemblies.

PurityPlus™ Specialty Gases

Series 820 Top-Trak

Mass Flowmeters

Description

Thermal mass flowmeters like the Series 820 Top-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 and accurate method of delivering gas to your system.

The 820 is designed to measure the flow of non-corrosive gases. The instruments built-in display, power supply, and readout electronics, provides and easy and convenient method of accurately monitoring the gas flow of your system. A straight, large diameter sensor tube prevents clogging and contamination.

Available in flow ranges from 0-10 sccm to 0-40 slpm. The standard unit can be supplied with either 0-5 VDC or 4-20 mA output signals.

How It Works

Gas enters the Top-Trak and divides into two flow paths. Most of the flow goes through the laminar flow by-pass. 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.

Materials

Wetted materials are
- 10% glass-filled nylon 6/6
- 316 stainless steel
- nickel plating
- Viton o-rings

Specifications

Accuracy
± ± 1.5% of full scale

Repeatability
± 0.5% of full scale

Gas and ambient temperature
32 to 120°F

Gas pressure
20 psig optimum, 150 psig max.

Leak integrity
1 x 10-4 ATM cc/sec of helium

Input power
12-18 VDC

Output signal
linear 0-5 VDC standard 4-20 mA optional

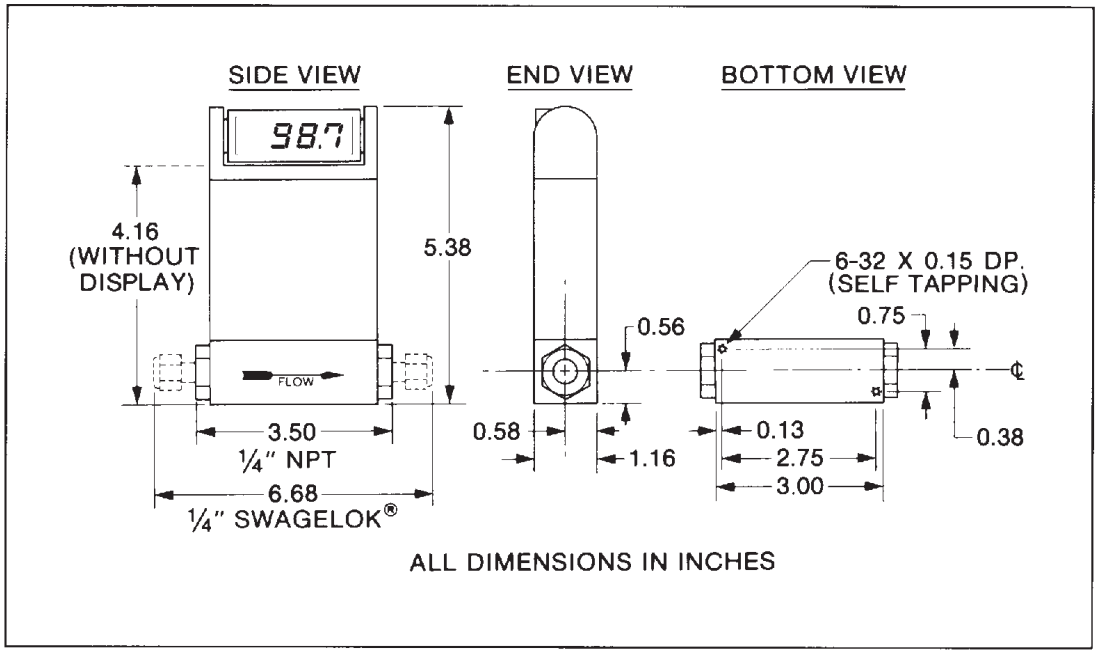
Response time
800 ms time constant

Pressure Coefficient
0.02% of full scale per psi (0.07 kg/cm^2) or better

Pressure drop

Flow Rate SLM	Max ΔP cm of water
up to 10	7
20	25
30	47
40	88

Temperature coefficient
0.15% of full scale per °C or better



Series 820 Dimensional Drawing

Ordering Information

822-W-X-Y-Z
(Select X, Y, and Z parameters from table below)

W = Inlet and oulet 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	All flows are based on standard conditions of 70°F and 1 ATM unless otherwise specified when ordering.
Z = factory set output option:	V = 0-5 VDC A = 4-20 mA	

PurityPlus™ Specialty Gases

Series 6200

Indicating Oxygen Trap

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 they 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

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.

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.

6200C Mounting Clip

Oxygen removing purifier for hydrogen

Series 6210

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

PurityPlus™ Specialty Gases

Series 6400

CO_2 Trap

Description

The 6400 Series carbon dioxide trap is designed to remove CO_2 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.

*Units with stainless steel fittings are also available. Add "SS" to part number.

Features

- Removes carbon dioxide to less than 0.5 ppm
- Inlet and outlet fitted with 40 micron stainless steel frits.
- Reaction with carbon dioxide indicated by color change from white to violet.
- CO_2 removing capacity: 6410 45 grams CO_2; 6425 90 grams CO_2
- Dimensions: 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	

* Add suffix "SS" to part number for stainless steel compression fitting.

8012C Mounting Clip

8040C Mounting Clip

Indicating moisture traps

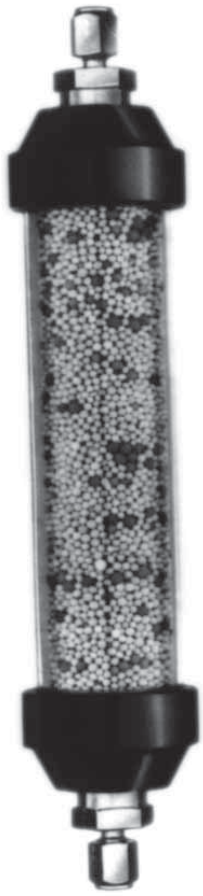
Series 8012, 8020, & 8040, 8050

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* 8012-4*	120 cc 120 cc	1/8” tubing compression fitting 1/4” tubing compression fitting
8020-2* 8020-4*	200 cc 200 cc	1/8” tubing compression fitting 1/4” tubing compression fitting
8040-2* 8040-4*	400 cc 400 cc	1/8” tubing compression fittings 1/4” tubing compression fittings
8040R	400 cc	Provides enough for three 120 cc, two 200 cc, or one 400 cc refill
8050-8*+ 8050R 8012C 8040C 8050C	735 cc 1500 cc	1/2” tubing compression fitting provides enough for two refill for mounting 8012 and 8020 units for mounting 8040 units only for mounting 8050 units only

+ 8050 is a non-indicating trap.
* Available with stainless steel compression fittings - add “SS: to part number.

PurityPlus™ Specialty Gases

Series 8060

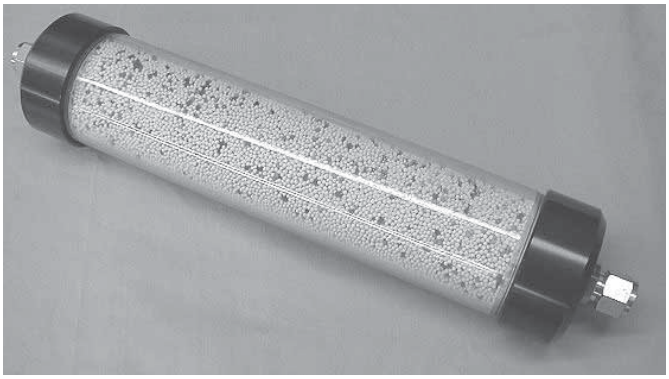
High capacity indicating moisture trap

Description

These traps are similar to the moisture traps on the opposite page but are capable of higher flow capacity and have greatly increased adsorption capacity. They are filled with a mixture of molecular sieve13X 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
- Inlet and outlet o-ring sealed connectors are equipped with 100 micron stainless steel sintered frits to prevent particulates from entering your system
- Field refillable
- High flow capacity - up to 20 SCFM
- Maximum operating pressure - 125 psig
- Moisture removal capacity - 245 grams
- Dimensions - 19” long x 3” diameter
- Connections - stainless steel 1/2” tubing compression fittings.



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	Capacity	Connections
8060-8SS	1350	1/2” tubing stainless steel compression fittings
8060R		Provides enough molecular sieve mix for two refills
8060C		Mounting clip (two per unit suggested)

Hydrocarbon traps

Series 8200

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.

PurityPlus™ Specialty Gases

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 5000

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 5000 units compatible with a wide variety of gases.	• 100% efficient at 0.01 micron level • Filter medium - porous PTFE Teflon® membrane • All welded 316L stainless steel construction • Internal finish - less than 15 R_a • 0.5 sq. ft. filter area provides high particle retention capacity • Excellent compatibility with a wide variety of gases	*Filtration* 100% @ 0.01 microns *Max. Operating Pressure* 1000 psig @ 70°F *Max. Operating Temperature* 100°F *Max. Flow* 250 slpm @ 15 psi ΔP

Ordering Information

Type of End Connection	Model Number	Connection Size		Dimensions			
		Inlet**	Outlet**	Length		Diameter	
				Inch	mm	Inch	mm
Standard Pipe	5000-P4FF	1/4” NPT female	1/4” NPT female	4.75	120.6	2.20	55.9
Tubing Compression	5100-T4FF 5100-T8FF	1/4” tubing compression 1/2” tubing compression	1/4” tubing compression 1/4” tubing compression	5.56 5.81	141.2 147.6	2.20 2.20	55.9 55.9
VCR® Compatible Face Seal	5200-V4MM	1/4” face seal male	1/4” face seal male	5.62	142.7	2.20	55.9

** 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 320D-500 is available with a capacity of 500 pounds has a 20” x 27” diamond plate steel platform.

The model 320M- 1000 has a 1000 pound capacity and accommodates cryogenic containers with its 20” x 27” aluminum diamond plate steel platform. A ramp is available for each model so that cylinders can easily be rolled on and 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
320D-500	500	0.1	20” w x 27” d x 1-7/8” h
320M-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
320R	ramp for 320D & 320M		20” w x 18” d x 1-7/8” h

Model 900

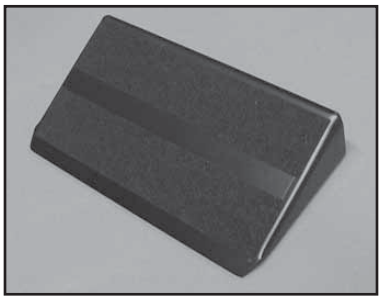
Cylinder scale for liquefied gases

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

Recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane and heavier hydrocarbon gases.

Features

- Heavy duty 16 gauge
- Stainless steel cover
- Dual dial scale - pounds and kilograms
- Color-coded easy to read dial

Specifications

- *Tare weight range*
  0-150 lbs. (0-68 kg.)
- *Product weight range*
  0-150 lbs. (0-68 kg.)
- *Total capacity*
  300 lbs (136 kg.)
  in 5 lb. (2 kg.) divisions
- *Readability*
  1 lb. (0.5 kg.) by estimation
- *Dimensions*
  10 ¾" x 10 ¼" x 2" high

Ordering Information

Model	Description
900	Scale with non-skid ramp
900-5	Scale only
900-6	Ramp only

Flash Arrestor

Series 8491

Description

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 then 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.

Features

- 100% flashback tested after assembly
- U/L listed and meets strict international standards (see table)
- Automatically re-sets for flashbacks and revers flow below 10 psig
- 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
- Stainless steel flame barrier positively extinguishes flame within the housing
- Checks reverse flow and provides positive shut-off of revers flow over 10 psig
- Thermal cut-off
- Built-in 100 micron stainless steel sintered filter on inlet
- High flow capacity (see table)

Materials

Body Alloy 360 brass	*Flame barrier* stainless steel
Internals brass	*Elastomers* Neoprene

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

PurityPlus™ Specialty Gases

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_v)
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.

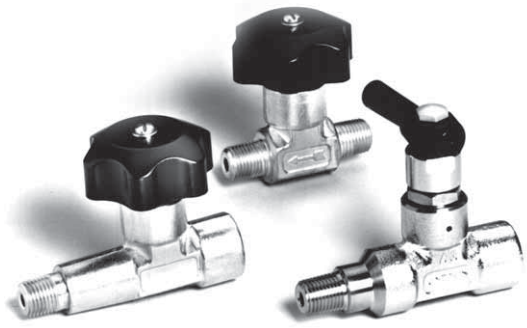
Ordering Information

Model	Material of Construction
8410V	Brass body, Viton® o-ring, stainless steel spring
8420E	316 stainless steel, EPR o-ring, stainless steel spring
8420V	316 stainless steel, Viton® o-ring, stainless steel spring
8450V	Monel®, Viton® o-ring, stainless steel spring

Note: Check valves with other o-ring materials are available.

High purity diaphragm packless valves

Series 8300



Description

The multiple metal diaphragm design and Kel-F® seat are the key elements to the high purity success of these valves. They are available ina variety of styles and fitting configurations to meet virtually any application.

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.

Advanced Features

- Metal diaphragm packless construction for diffusion resistant operation
- Capable of passing a helium leak-rate test to 10^{-10} cc/sec
- Available in multiple turn and 90° lever operated designs.

Typical Applications

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.

Materials

Series 8310

Body
Brass

Seat
Kel-F®

Diaphragm
Stainless Steel

Series 8320

Body
316 Stainless steel

Seat
Kel-F®

Diaphragm
Stainless steel

Specifications

Operating pressure
brass - 3000 psig
stainless steel - 3000 psig

Operating temperature range
40° to 140°F

Flow coefficient (Cv)
0.13

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
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.

PurityPlus™ Specialty Gases

Series 8600

Relief valves

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.	• Working pressure to 3000 psig • Wide range of pressure adjustment • 100% tested for crack and reseal performance • Available in brass and stainless steel	*Maximum Working Pressure @ 70°F* 3000 pisg *Flow Coefficient (Cv)* 0.35 *Temperature Rating* with Buna-N o-ring -10 to 250°F with Viton® o-ring -10 to 375°F *O-ring Material* brass Buna-N stainless steel Viton®

Ordering Information

Model	Material	Adjustable Range	Connections inlet x outlet
8614-20-P4MM	brass	3-20 psig	1/4” NPT male x 1/4” NPT female
8614-65-P4MM	brass	20-65 psig	1/4” NPT male x 1/4” NPT female
8614-175-P4MM	brass	65-175 psig	1/4” NPT male x 1/4” NPT female
8614-350-P4MM	brass	175-350 psig	1/4” NPT male x 1/4” NPT female
8614-600-P4MM	brass	350-600 psig	1/4” NPT male x 1/4” NPT female
8614-20-P4FF	brass	3-20 psig	1/4” NPT female x 1/4” NPT female
8614-65-P4FF	brass	20-65 psig	1/4” NPT female x 1/4” NPT female
8614-175-P4FF	brass	65-175 psig	1/4” NPT female x 1/4” NPT female
8614-350-P4FF	brass	175-350 psig	1/4” NPT female x 1/4” NPT female
8614-600-P4FF	brass	350-600 psig	1/4” NPT female x 1/4” NPT female
8624-20-P4MM	stainless	3-20 psig	1/4” NPT male x 1/4” NPT male
8624-65-P4MM	stainless	20-65 psig	1/4” NPT male x 1/4” NPT male
8624-175-P4MM	stainless	65-175 psig	1/4” NPT male x 1/4” NPT male
8624-350-P4MM	stainless	175-350 psig	1/4” NPT male x 1/4” NPT male
8624-600-P4MM	stainless	350-600 psig	1/4” NPT male x 1/4” NPT male
8624-20-P4FF	stainless	3-20 psig	1/4” NPT female x 1/4” NPT female
8624-65-P4FF	stainless	20-65 psig	1/4” NPT female x 1/4” NPT female
8624-175-P4FF	stainless	65-175 psig	1/4” NPT female x 1/4” NPT female
8624-350-P4FF	stainless	175-350 psig	1/4” NPT female x 1/4” NPT female
8624-600-P4FF	stainless	350-600 psig	1/4” NPT female x 1/4” NPT female

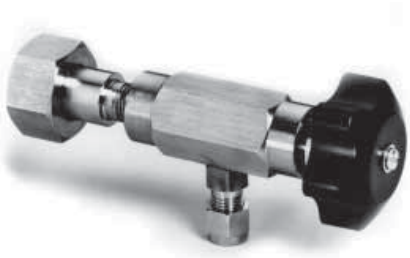
Manual control valves — Series 8500

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

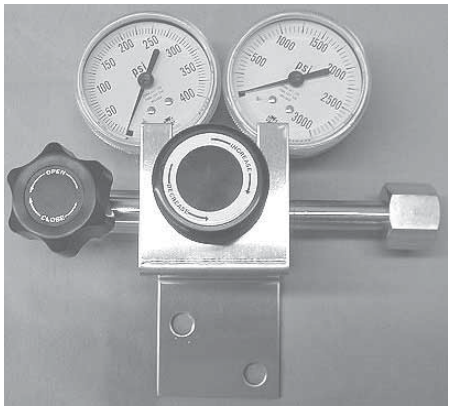
Series 8520 - 303 Stainless steel		Series 8523 - 303 Stainless Steel with 0-3000 psig Cylinder pressure Gauge		Series 8550 - Monel®	
Model	Outlet Connection	Model	Outlet Connection	Model	Outlet Connection
8520H* 8520T* 8520PF*	1/4” hose barb 1/4” compression fitting 1/4” NPT female	8523H* 8523T* 8523PF*	1/4” hose barb 1/4” compression fitting 1/4” NPT female	8550H* 8550T* 8550PF*	1/4” hose barb 1/4” compression fitting 1/4” NPT female

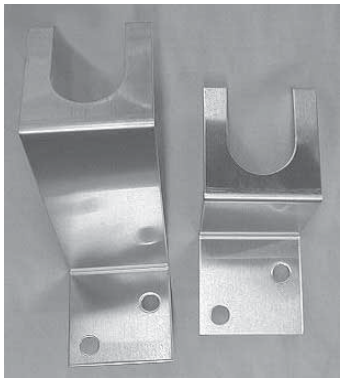
*Specify CGA connection number when ordering

Easy-Mount regulator bracket — Series EZ3000

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

PurityPlus™ Specialty Gases

Gas Detection Systems

Fixed Installation Type – Beacon 100, Beacon 200, 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 2 /H 2 S/CO direct wire sensors (Beacon 100 & 200)
- 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

- Laboratories
- Semiconductor manufacturing facilities
- Petrochemical plants & refineries
- Water & wastewater treatment plants
- Pulp & paper mills
- Gas, telephone, & electric utilities
- Parking garages
- Manufacturing facilities

About Sensors

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.

Direct Wire Detectors

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 100 & 200 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.

Fixed Installation Type – Beacon 100, Beacon 200, and Beacon 800

Gas Detection Systems

Ordering Information

When ordering a Beacon system please specify the following components:
1. Controller part number
2. Detector assemblies required

Model	Description
72-2101 RK	Beacon 100 single point controller
72-2102 RK	Beacon 200 two point controller
72-2108 RK	Beacon 800 eight point controller

Diffusion 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

Sample draw detectors have an integral pump, which draws the surrounding air to the detector. The are a 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 100 & Beacon 200), and also one is not needed for short distance wiring of H2S or CO sensors for the Beacon 100 & 200. 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

• *Enclosure*
Wall mounting gray polycarbonate with hinged cover

Dimensions	*Beacon 100*	*Beacon 200*	*Beacon 800*
	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”
• *Conduit Connection ½” NPT conduit hubs*	2	3	4

• *Wiring Termination:* Screw type terminal block14 gauge max.
• *Environmental Operating Temp:* -4°F to 122°F (-20°C to 50°C)
• *Storage Temp:* -4°F to 158°F (-20°C to 70°C)
• *Relative Humidity:* 0 - 100% RH
• *Enclosure Rating:* NEMA-4X enclosure, waterproof, chemical, and weather resistant.

Inputs

• *Direct Wired Sensors (Beacon 100 & 200 only)*
• *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:** Beacon 100: 4 relays
- 12 amp rating (at 115 VAC), SPDT isolated contacts.3 relays for gas alarm levels 1 relay for malfunction
Beacon 200: 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
Beacon 800: 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 100: 1 display, 16 characters per line; 2 lines.
Beacon 200: 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 100: 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 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 100	200	800
Ammonia NH3	0 - 75 ppm	GD-K8A-NH3	GD-K7D2 NH3	X	X	X
Arsine AsH3	0 - 0.2 ppm	-	GD-K7D2ASH3	X	X	X
Boron Trichloride BCl3	0 - 15 ppm	GD-K8A-BCL3	GD-K7D2 BCL3	X	X	X
Boron Trifluoride BF3	0 - 9 ppm	-	GD-K7D2 BF3	X	X	X
Carbon Tetrachloride CCl4	0 - 30 ppm	-	GD-K8DT-CCL4	X	X	X
Carbon Monoxide (XP) CO	0 - 300 ppm	65-2432RK	X	X	X	
Chlorine Cl2	0 - 3 ppm	GD-K8A-CL2	GD-K7D2 Cl2	X	X	X
Chlorine Trifluoride ClF3	0 - 1 ppm	-	GD-K7D2 ClF3	X	X	X
Combustibles (XP) LEL	0 - 100 %	61-1000RK	X	X		
Combustibles (4-20mA) (XP) LEL	0 - 100 %	65-2400RK	-	X	X	X
Diborane B2H6	0 - 0.3 ppm	GD-K8A-B2H6	GD-K7D2 B2H6	X	X	X
Dichlorosilane DCS	0 - 15 ppm	GD-K8A-DCS	GD-K7D2 DCS	X	X	X
Disilane Si2H6	0 - 15 ppm	GD-K8A-SI2H6	GD-K7D2 Si2H6	X	X	X
Fluorine F2	0 - 3 ppm	-	GD-K7D2 F2	X	X	X
Germane GeH4	0 -2 ppm	-	GD-K35PN-GEH4	X	X	X
Hydrazine N2H4	0 - 10 ppm	-	GD-K34PN-N2H4	X	X	X
Hydrogen H2	0 - 2000 ppm	GD-A8V-H2	GD-D8V-H2	X	X	X
Hydrogen (Direct) H2	0 - 2000 ppm	61-1050RK	X	X		
Hydrogen (Specific) H2LEL	0 - 100%	61-1001RK	X	X		
Hydrogen (4-20mA) H2	0 - 2000 ppm	65-2440RK	X	X	X	
Hydrogen Bromide HBr	0 - 9 ppm	-	GD-K7D2 HBr	X	X	X
Hydrogen Chloride HCl	0 -15 ppm	-	GD-K7D2 HCl	X	X	X
Hydrogen Chloride HCl	0 - 15 ppm	GD-K8A-HCL	X	X	X	
Hydrogen Cyanide HCN	0 -30 ppm	-	GD-K35PN HCN	X	X	X
Hydrogen Cyanide HCN	0 - 40 ppm	GD-K8A-HCN	GD-K7D2 HCN	X	X	X
Hydrogen Fluoride HF	0 -9 ppm	-	GD-K7D2 HF	X	X	X
Hydrogen Selenide H2Se	0 - 0.2 ppm	-	GD-K35 H2Se	X	X	X
Hydrogen Sulfide H2S	0 -1 ppm	-	GD-K7D2 H2S	X	X	X
Hydrogen Sulfide H2S	0 - 100 ppm	65-2422RK	-	X	X	X
Nitric Oxide NO	0 -100 ppm	-	GD-K7D2 NO	X	X	X
Nitrogen Dioxide NO2	0 - 15 ppm	GD-K8A	GD-K7D2 NO2	X	X	X
Nitrogen Trifluoride NF3	0 - 30 ppm	-	GD-K8D NF3	X	X	X
Nitrogen Tetraoxide N2O4	0 -15 ppm	-	GD-K7D2 N2O4	X	X	X
Oxygen (4-20mA) O2	0 -25 %	65-2504RK	-	X	X	X
Oxygen (Direct) O2	0 - 25 %	65-2502RK	-	X	X	
Ozone O3	0 - 1 ppm	GD-K8A-O3	GD-K7D2 O3	X	X	X
Phosphine PH3	0 - 1 ppm	GD-K8A-PH3	GD-K7D2 PH3	X	X	X
Phosphorus Pentafluoride PF5	0 - 9 ppm	-	GD-K7D2 PF5	X	X	X
Phosphorus Trichloride PCl3	0 - 15 ppm	GD-K8A-PCL3	GD-K7D2 PCl3	X	X	X
Phosphorus Trifluoride PF3	0 - 9 ppm	-	GD-K7D2 PF3	X	X	X
Silane SiH4	0 - 15 ppm	GD-K8A-SIH4	GD-K7D2 SiH4	X	X	X
Silicon Tetrachloride SiCl4	0 -15 ppm	GD-K8A-SICL4	GD-K7D2 SiCl4	X	X	X
Silicon Tetrafluoride SiF4	0 -9 ppm	-	GD-K7D2 SiF4	X	X	X
Sulfur Dioxide SO2	0 -30 ppm	GD-K8A-SO2	GD-K7D2 SO2	X	X	X
Sulfur Tetrafluoride SF4	0 - 9 ppm	-	GD-K7D2 SF4	X	X	X
Tetraethyl Orthosilicate TEOS	0 - 15 ppm	-	GD-S8DG-TEOS	X	X	X
Trichlorosilane TCS	0 - 15 ppm	GD-S8DG-TCS	GD-K7D2 TCS	X	X	X
Tungsten Hexafluoride WF6	0 -9 ppm	-	GD-K7D2 WF6	X	X	X
1,1,1-Trichloroethane C2H3Cl3	0 - 2000 ppm	GD-A8V	-	X	X	X

PurityPlus™ Specialty Gases

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 & 0-50,000 ppm	72-5101RK
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 (O2)	0 - 40% Vol.
	Carbon Monoxide	(CO) 0 - 500 ppm
	Hydrogen Sulfide (H 2 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 infared.

- *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.

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 stap 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 nad 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 a n 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

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

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.

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.

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 form 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

"Gas Station" process stands

Series 495

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.

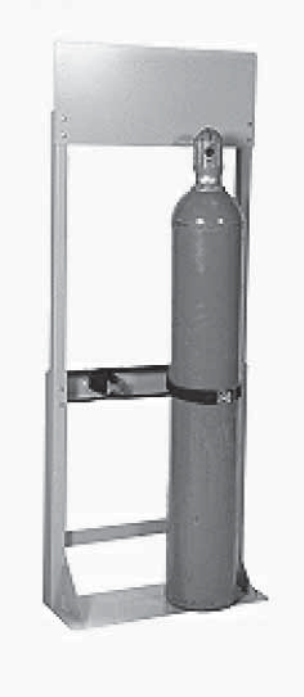
Ordering Information

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



PurityPlus™ Specialty Gases

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 nitro blue enamel 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.

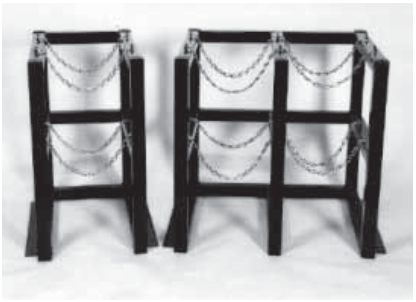
Features

- Safe cylinder restraint
- Organized gas cylinder storage
- Simple Installation
- Uses space efficiently
- Removable and relocatable

Ordering Information

Model	Description	Nominal Dimensions
Single restraint models		
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
Dual restraint models		
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

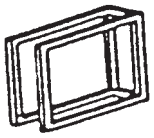


Gas cylinder restraint and storage

490-111

490-112

490-121



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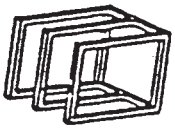

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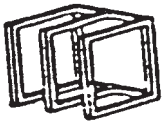

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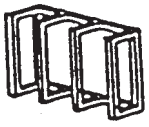
490-211



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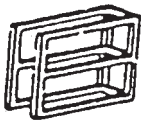

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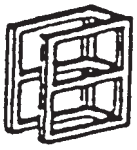

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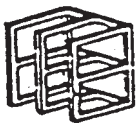

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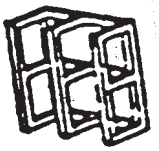

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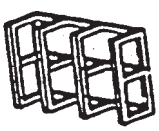

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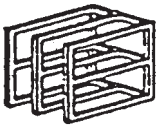


490-223

Cylinder hand trucks

Model 6114 & Model 6214

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.

PurityPlus™ Specialty Gases

Series 7000

Gas safety storage cabinets

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 though 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
7100	one cylinder cabinet
7200	two cylinder cabinet
7300	three cylinder cabinet
7400	four cylinder cabinet
Options	**Model**
• Keyed door latch(es)	**7000-1**
• Keyed window latch(es)	**7000-2**
• Adjustable small cylinder shelf	**7000-3**

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)
7100	one	18’w x 18”d x 72”h	16”w x 70”h	235 lbs.	175
7200	two	24”w x 18”d x 72”h	22”w x 70”h	283 lbs.	250
7300	three	36”w x 18”d x 72”h	left 22”w x 70”h right 16”w x 70”h	331 lbs.	450
7400	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”.

Cylinder hand trucks

Model 6114 & Model 6214

Description

Model 90001

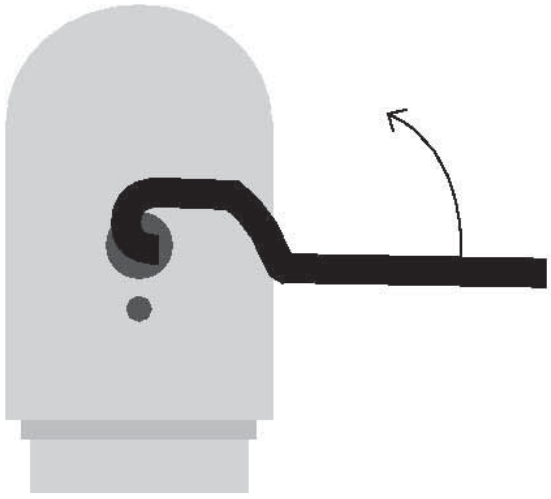
This universal cylinder wrench has 3 openings on one end (11/16", 1-1/8", 1-1/4") for tightening the various cylinder valve connections and most commonly used gas connections. The opposite end has 3/8" square box for opening cylinder valves that do not have hand wheels.

Model 90002

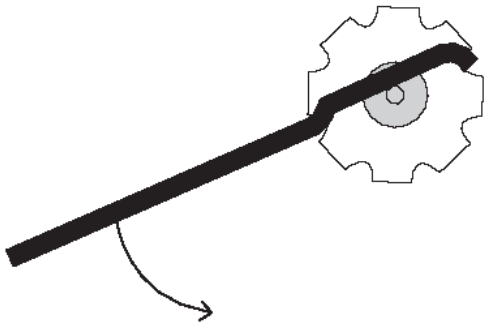
This wrench has a basic 3/8" square for opening cylinder valves that do not have hand wheels, such as chlorine and hydrogen sulfide.

Model 90003

The special configuration of this wrench provides an easy method of opening extra tight, hand wheel operated cylinder valves and removing difficult cylinder caps.



Remove difficult cylinder caps



Open tight valves easily

PurityPlus™ Specialty Gases

Series 601, 602, 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 and 602

- 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
  602 1/4" NPT female x 1/4" NPT female
  602M 1/4" NPT male x 1/4" NPT male
  602MF 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	602-3	3.0 feet	604-6	6.0 feet
601M-2	2.0 feet	602M-3	3.0 feet	604M-6	6.0 feet
601MF-2	2.0 feet	602MF-3	3.0 feet	604MF-6	6.0 feet
601-3	3.0 feet	602-6	6.0 feet	605-2	2.0 feet
601M-3	3.0 feet	602M-6	6.0 feet	605M-2	2.0 feet
601MF-3	3.0 feet	602MF-6	6.0 feet	605MF-2	2.0 feet
601-6	6.0 feet	604-2	2.0 feet	605-3	3.0 feet
601M-6	6.0 feet	604M-2	2.0 feet	605M-3	3.0 feet
601MF-6	6.0 feet	604MF-2	2.0 feet	605MF-3	3.0 feet
602-2	2.0 feet	604-3	3.0 feet	605-6	6.0 feet
602M-2	2.0 feet	604M-3	3.0 feet	605M-6	6.0 feet
602MF-2	2.0 feet	604MF-3	3.0 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.

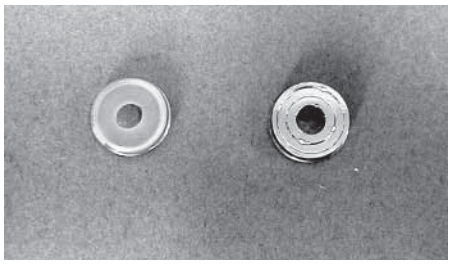
UHP (DISS) Cylinder Connections

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.	• Available with in three mating styles 1/4” face seal male 1/4” NPT male 1/4” tube stub • Supplied as a set nut, nipple, and nickel gasket

Ordering Information

Model	Description	Model	Description
DISS632-P4M DISS632-V4M DISS632-T4S	632 x 1/4” NPT male 632 x 1/4” male face seal 632 x 1/4” tube stub	DISS714-P4M DISS714-V4M DISS714-T4S	714 x 1/4” NPT male 714 x 1/4” male face seal 714 x 1/4” tube stub
DISS634-P4M DISS634-V4M DISS634T4S	634 x 1/4” NPT male 634 x 1/4” male face seal 634 x 1/4” tube stub	DISS716-P4M DISS716-V4M DISS716-T4S	716 x 1/4” NPT male 716 x 1/4” male face seal 716 x 1/4” tube stub
DISS636-P4M DISS636-V4M DISS636-T4S	636 x 1/4” NPT male 636 x 1/4” male face seal 636 x 1/4” tube stub	DISS718-P4M DISS718-V4M DISS718-T4S	718 x 1/4” NPT male 718 x 1/4” male face seal 718 x 1/4” tube stub
DISS638-P4M DISS638-V4M DISS638-T4S	638 x 1/4” NPT male 638 x 1/4” male face seal 638 x 1/4” tube stub	DISS720-P4M DISS720-V4M DISS720-T4S	720 x 1/4” NPT male 720 x 1/4” male face seal 720 x 1/4” tube stub
DISS640-P4M DISS640-V4M DISS640-T4S	640 x 1/4” NPT male 640 x 1/4” male face seal 640 x 1/4” tube stub	DISS722-P4M DISS722-V4M DISS722-T4S	722 x 1/4” NPT male 722 x 1/4” male face seal 722 x 1/4” tube stub
DISS642-P4M DISS642-V4M DISS642T4S	642 x 1/4” NPT male 642 x 1/4” male face seal 642 x 1/4” tube stub	DISS724-P4M DISS724-V4M DISS724-T4S	724 x 1/4” NPT male 724 x 1/4” male face seal 724 x 1/4” tube stub
DISS712-P4M DISS712-V4M DISS712-T4S	712 x 1/4” NPT male 712 x 1/4” male face seal 712 x 1/4” tube stub	DISS726-P4M DISS726-V4M DISS726-T4S	726 x 1/4” NPT male 726 x 1/4” male face seal 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

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.	• 1/4” NPT lower male connection • Cleaned for oxygen service - brass and stainless steel only

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		

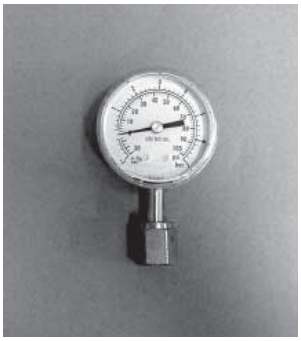
Other sizes and ranges available.

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.	• 1/4” female face seal connection • Dual scale dial psig/bar • Cleaned for oxygen service

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)



Cylinder Connections

Description

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.

Ordering Information

Connection	Brass	Stainless Steel	Chrome-Plated Brass
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

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.

Legend

◊ - Primary Hazard
R - Recommended
N - Not Recommended
X - Depends on conditions

	Hazards for Humans				Materials of Construction								
Gas	Toxic	Flammable	Corrosive		Aluminum	Copper	Brass	Steel	Stainless Steel	Monel®	Kel-F®	Teflon®	**Special Characteristics**
Acetylene		◊			R	N	R	R	R		R	R	Do not use at pressures exceeding 15 psig
Air					R	R	R	R	R	R	R	R	
Ammonia	◊	◊	◊		R	N	N	X	R		R	R	Causes stress cracking of copper and copper alloys
Argon					R	R	R	R	R		R	R	
Arsine*	◊	◊			X	N	X	X	R		R	R	Highly toxic, excessive exposure may have delayed effect
Boron Trichloride	◊		◊		N	X	X	X	X	X	R	R	
Boron Trifluoride	◊		◊		X	R	R	R	R	R	R	R	
1-3, Butadiene		◊			R	R	R	R	R		R	R	
Butane		◊			R	R	R	R	R		R	R	
Butenes		◊			R	R	R	R	R		R	R	
Carbon Dioxide					R	R	R	R	R		R	R	
Carbon Monoxide	◊	◊			R	R	R	R	R		R	R	
Carbonyl Sulfide	◊	◊			R	N	N	X	R		R	R	Treat as Hydrogen Sulfide, affects central nervous system
Chlorine	◊		◊		N	N	N	X	X	X	R	R	Very toxic and damaging to the respiratory system
Cyanogen*	◊	◊			X			R	R		R	R	Treat as cyanides
Deuterium		◊			R	R	R	R	R		R	R	
Dimethylamine	◊	◊	◊		X	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Dimethyl Ether		◊			R	R	R	R	R		R	R	
Ethane		◊			R	R	R				R	R	
Ethyl Chloride	◊	◊					R	R	R		R	R	
Ethylene		◊			R	R	R	R	R		R	R	
Ethylene Oxide	◊	◊				N	N	R	R		R	R	Exposure of liquid on skin or clothing can cause dermatitis
Fluorine*	◊		◊		R	R	X		R	R	N	X	Strong oxidant, can ignite combustible materials and metals
Helium					R	R	R	R	R		R	R	
Hydrogen		◊			R	R	R	R	R		R	R	
Hydrogen Bromide	◊		◊		N	X	N	X	X	X	R	R	Steel or stainless steel serviceable in dry liquid or gas service
Hydrogen Chloride	◊		◊		N	X		X	X	X	R	R	Steel or stainless steel serviceable in dry liquid or gas service
Hydrogen Fluoride*	◊		◊		X	R	R	R	R		R	R	Exposure can attack skin, bones and fingernails
Hydrogen Selenide	◊	◊			N	N	N	X	R		R	R	Extremely toxic, odor deadens the olfactory nerves
Hydrogen Sulfide*	◊	◊			N	N	N	X	R		R	R	Odor deadens olfactory nerves, can cause paralysis
Isobutane		◊			R	R	R	R	R		R	R	
Isobutylene		◊			R	R	R	R	R		R	R	
Krypton					R	R	R	R	R		R	R	

*It is recommended that users thoroughly familiarize themselves with the specific properties of this gas.

Gas Safety and Material Compatibility Data Chart

	Hazards for Humans				Materials of Construction								
	Toxic	Flammable	Corrosive		Aluminum	Copper	Brass	Steel	Stainless Steel	Monel®	Kel-F®	Teflon®	
Gas													**Special Characteristics**
Methane	◊	◊			R	R	R	R	R		R	R	
Methyl Acetylene		◊			R	N	X	R	R		R	R	
Methyl Bromide	◊	◊			X	R	R	R	R		R	R	
Methyl Chloride	◊	◊			N	X	R	R	R		R	R	Forms explosive compounds with aluminum
Methyl Mercaptan	◊	◊			R	N	X	R	R		R	R	
Monoethylamine	◊	◊			X	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Monomethylamine	◊	◊			X	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Neon					R	R	R	R	R		R	R	
Nitric Oxide	◊		◊		R	N	N	X	R	N	R	R	Readily reacts with Oxygen to form Nitrogen Dioxide
Nitrogen					R	R	R	R	R		R	R	
Nitrosyl Chloride	◊		◊		N	N	N	N	N	R		R	Very corrosive, attacks most metals except nickel
Nitrous Oxide					R	R	R	R	R		R	R	
Oxygen*					R	R	R	R	R		R	R	Strong oxidant, ignites combustible matter spontaneously
Phosgene	◊		◊		N	N	N	X	X	R	R	R	Very toxic
Phosphine*	◊	◊			R	X	R	R	R		R	R	Highly toxic, high concentrations are pyrophoric
Propane		◊			R	R	R	R	R		R	R	
Propylene		◊			R	R	N	R	R		R	R	
Silane*	◊	◊			R	R	X	R	R		R	R	Pyrophoric
Silicon Tetrafluoride	◊		◊		R	R	R	R	R		R	R	
Sulfur Dioxide	◊		◊		R	R	R	R	R		R	R	
Sulfur Hexafluoride					R	R	R	R	R		R	R	
Sulfur Tetrafluoride	◊		◊		R	R	R	R	R		R	R	
Trimethylamine	◊	◊			R	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Xenon					R	R	R	R	R		R	R	

*It is recommended that users thoroughly familiarize themselves with the specific properties of this gas.

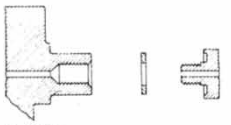
All data presented are considered accurate and reliable but supplier assumes no liability or responsibility of any kind.

Legend

◊ - Primary Hazard
R - Recommended
N - Not Recommended
X - Depends on conditions

PurityPlus™ Specialty Gases

CGA CONNECTIONS



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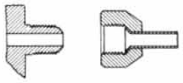
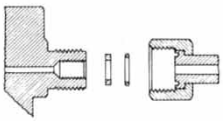
.3125-32UNEF-2B-RH-INT



CGA 165
.4375-20UNF-2A-RH=EXT (1/4 in. SAE Flare)



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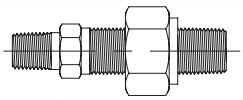
.625-18UNF-2A-RH-EXT



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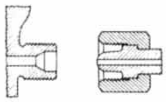
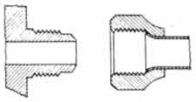


CGA 280
.745-14NGO-RH-EXT

CGA 290
.745-14NGO-LH-EXT



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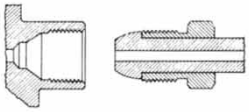
.750-16UNF-2A-RH-EXT (1/2in. SAE Flare)



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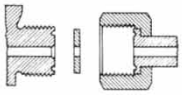
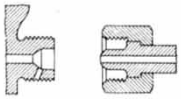


CGA 320
.825-14NGO-RH-EXT (Flat Nipple)



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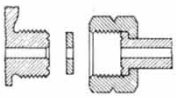

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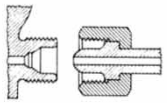

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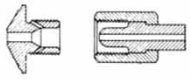

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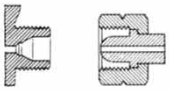

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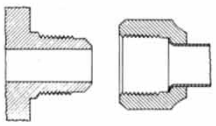

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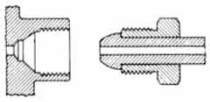
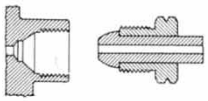


CGA 500
.885-14NGO-RH-INT (Bullet Nipple)



CGA 510
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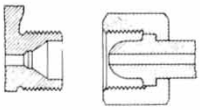

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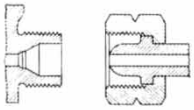
.903-14NGO-RH-EXT



CGA 555
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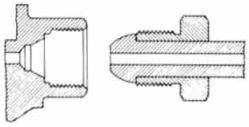
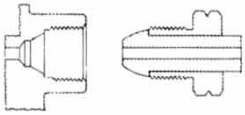


CGA 580
.965-14NGO-RH-INT



CGA 590
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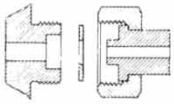

CGA 660
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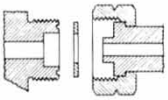

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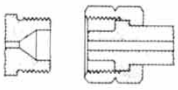
1.030-14NGO-LH-EXT (Face Washer)



CGA 677
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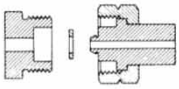

CGA 678
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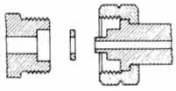

CGA 679
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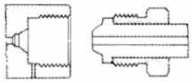
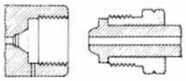
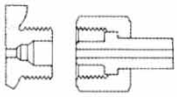


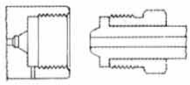
CGA 680
1.045-14NGO-RH-INT



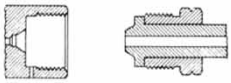
CGA 695
1.045-14NGO-LH-INT



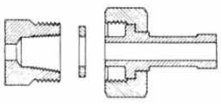
CGA 701
1.103-14NGO-RH-EXT



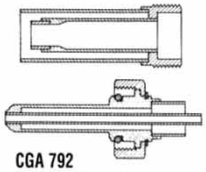
CGA 702
1.125-14NGO-RH-INT



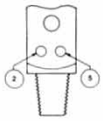
CGA 703
1.123-14NGO-LH-INT



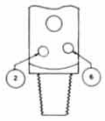
CGA 705
1.125-14UNS-2A-RH-EXT



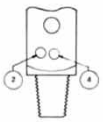
CGA 792
1.500-12UNF-2A-RH-EXT



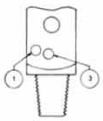
CGA 870
PIN-INDEXED YOKE, PINS 2-5



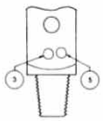
CGA 880
PIN-INDEXED YOKE, PINS 2-6



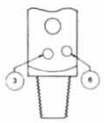
CGA 890
PIN-INDEXED YOKE, PINS 2-4



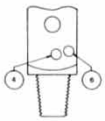
CGA 900
PIN-INDEXED YOKE, PINS 1-3



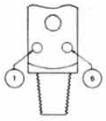
CGA 910
PIN-INDEXED YOKE, PINS 3-5



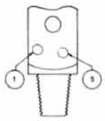
CGA 920
PIN-INDEXED YOKE, PINS 3-6



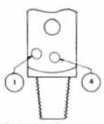
CGA 930
PIN-INDEXED YOKE, PINS 4-6



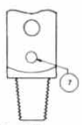
CGA 940
PIN-INDEXED YOKE, PINS 1-6



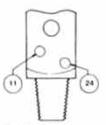
CGA 950
PIN-INDEXED YOKE, PINS 1-5



CGA 960
PIN-INDEXED YOKE, PINS 1-4



CGA 965
PIN-INDEXED YOKE, PIN NO. 7



CGA 973
PIN-INDEXED YOKE, PINS 11-24

Length

	Å	cm	ft	in	m	micron	mm	yd
				Multiply By				
Å	--------	1×10^{-8}	3.28×10^{-9}	3.93×10^{-9}	1×10^{-10}	1×10^{-4}	1×10^{-7}	1.09×10^{-10}
cm	1×10^{8}	--------	3.28×10^{-2}	3.94×10^{-1}	1×10^{-2}	1×10^{4}	10	1.09×10^{-2}
ft	3.04×10^{9}	3.048×10^{1}	--------	1.2×10^{1}	3.04×10^{-1}	3.04×10^{5}	3.04×10^{2}	3.33×10^{-1}
in	2.54×10^{8}	2.54×10^{0}	8.33×10^{-2}	--------	2.54×10^{2}	2.54×10^{4}	2.54×10^{1}	2.77×10^{2}
m	1×10^{10}	1×10^{2}	3.281×10^{0}	3.93×10^{1}	--------	1×10^{6}	1×10^{3}	1.09×10^{0}
micron	1×10^{4}	1×10^{-4}	3.28×10^{-6}	3.93×10^{-5}	1×10^{-6}	--------	1×10^{-3}	1.09×10^{-6}
mm	1×10^{7}	1×10^{-3}	3.28×10^{-3}	3.93×10^{-2}	1×10^{-2}	1×10^{3}	--------	1.09×10^{-3}
yd	9.14×10^{9}	9.14×10^{1}	3×10^{0}	3.6×10^{1}	9.14×10^{-1}	9.14×10^{5}	9.14×10^{2}	--------

Flow

	cm^3/min	cm^3/sec	ft^3/hr	ft^3/min	m^3/hr	m^3/min	L/hr	L/min
				Multiply By				
cm^3/min	--------	1.66×10^{-2}	2.12×10^{-3}	3.53×10^{-5}	6×10^{-5}	1×10^{-6}	6.0×10^{-2}	1×10^{-2}
cm^3/sec	6×10^{1}	--------	1.27×10^{-1}	2.12×10^{-3}	3.6×10^{-3}	6×10^{-5}	3.6×10^{0}	6×10^{-2}
ft^3/hr	4.72×10^{2}	7.87×10^{1}	--------	1.67×10^{-2}	2.83×10^{-2}	4.72×10^{-4}	2.83×10^{1}	4.72×10^{-1}
ft^3/min	2.83×10^{4}	4.72×10^{2}	6.0×10^{1}	--------	1.7×10^{1}	2.83×10^{-2}	1.7×10^{-2}	2.83×10^{1}
m^3/hr	1.67×10^{4}	2.78×10^{2}	3.53×10^{1}	5.89×10^{-2}	--------	1.67×10^{-2}	1×10^{3}	1.67×10^{1}
m^3/min	1×10^{6}	1.67×10^{4}	2.12×10^{3}	3.53×10^{1}	6.0×10^{1}	--------	6.0×10^{4}	1×10^{3}
L/hr	1.67×10^{1}	2.78×10^{-1}	3.53×10^{-2}	5.89×10^{-4}	1×10^{-3}	1.67×10^{-5}	--------	1.67×10^{-2}
L/min	1×10^{3}	1.67×10^{1}	2.12×10^{0}	3.53×10^{-2}	6.0×10^{-2}	1×10^{-3}	6.0×10^{1}	--------

Pressure

	atm	BAR	Ft of H_2O	in of Hg	in of H_2O	kg/cm^2	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_2O	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_2O	0.002	0.002	0.083	0.074	--------	0.003	0.025	1.868	0.036
kg/cm^2	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	--------

Gases CGA Selection Chart

PurityPlus™ Specialty Gases

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, KR-85
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 Hexaflouride
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
330	Chlorine	Nitrogen
350	Diborane	Argon, Helium, Hydrogen, Nitrogen
580	Freon-12	Nitrogen
296	Helium	Oxygen
350	Hexane	Nitrogen
350	Isobutane	Nitrogen
350	Krypton-85	Carbon Monoxide, Hydrogen or Methane
330	Krypton-85	Chlorine
540	Krypton-85	Oxygen
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
660	Sulfur Dioxide	Air or Nitrogen
590	Sulfur Hexaflouride	Argon, Helium or Nitrogen
350	Sulfur Hexaflouride	Hydrogen
350	Tritium	Argon, Carbon Dioxide, Hydrogen, Methane, Neon, Nitrogen, Krypton, or Xenon

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.

*Exceptions: Flammables in Air or Oxidizers

*Propane in Air, Methane in Air, Carbon Monoxide in Air: CGA 590

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 chart above can be used as a reference for the CGA connections.

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.

Weight

	gm	kg	mg	oz	lbs	Ton
			Multiply By			
gm	--------	.001	1000	0.035	0.002	1.1×10^{-6}
kg	1000	--------	1×10^{6}	3.53×10^{1}	2.205	0.001
mg	0.001	1×10^{-6}	--------	3.53×10^{-4}	2.205×10^{-6}	1.1×10^{-9}
oz	2.83×10^{1}	2.83×10^{-2}	2.83×10^{4}	--------	6.25×10^{-2}	3.13×10^{-5}
lbs	4.54×10^{2}	4.54×10^{1}	4.54×10^{5}	16	--------	5.0×10^{-4}
Ton	9.07×10^{5}	9.07×10^{2}	9.07×10^{8}	3.2×10^{4}	2.0×10^{3}	--------

Volume

	cm^3 (ml)	ft^3	in^3	m^3	US gal.	L
			Multiply By			
cm^3 (ml)	--------	3.53×10^{-5}	6.10×10^{-2}	1×10^{-6}	2.56×10^{-3}	1×10^{-3}
ft^3	2.83×10^{4}	--------	1.73×10^{3}	2.83×10^{-2}	7.48	2.83
in^3	1.64	5.79×10^{-6}	--------	1.64×10^{-5}	4.33×10^{-3}	1.64×10^{-2}
m^3	1×10^{6}	3.53	6.10×10^{4}	--------	2.64×10^{2}	1×10^{3}
US gal.	3.79×10^{3}	1.34×10^{-1}	2.31×10^{2}	3.79×10^{-3}	--------	3.79
L	1×10^{3}	3.54×10^{-1}	6.10×10^{1}	1×10^{-3}	2.64×10^{-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
Avagardro's Number	6.022×10^{23}	molecules/gm-mole
Gas Law Constant	1.98719	cal/(gm-mol)(°K)
	1.98719	Btu/(lbs-mole)(°R)
	82.0568	$(cm^3)(atm)/(gm\text{-}mole)(°K)$
	0.0820568	(L)(atm)/(gm-mole)(°K)
	10.7314	$(ft^3)(lb)/(in^2)(lbs\text{-}mole)(°R)$
	0.730228	$(ft^3)(atm)/(lbs\text{-}mole)(°R)$

Density

	gms/cm^3	kg/cm^3	lbs/ft^3	lbs/in^3	lbs/US gal.
			Multiply By		
gms/cm^3	--------	1000	6.24×10^{1}	3.61×10^{-2}	8.35
kg/cm^3	1×10^{-3}	--------	6.24×10^{-2}	3.61×10^{-3}	8.35×10^{-3}
lbs/ft^3	1.60×10^{-2}	1.60×10^{1}	--------	3.61×10^{-5}	1.33×10^{-1}
lbs/in^3	2.77×10^{1}	2.77×10^{4}	1.73×10^{3}	--------	2.31×10^{2}
lbs/US gal.	1.2×10^{-1}	1.2×10^{2}	7.48	4.33×10^{-3}	--------

Scientific Notation

Notation	Equivalent	Notation	Equivalent
1×10^{10}	10,000,000,000	1×10^{-1}	0.1
1×10^{9}	1,000,000,000	1×10^{-2}	0.01
1×10^{8}	100,000,000	1×10^{-3}	0.001
1×10^{7}	10,000,000	1×10^{-4}	0.0001
1×10^{6}	1,000,000	1×10^{-5}	0.00001
1×10^{5}	100,000	1×10^{-6}	0.000001
1×10^{4}	10,000	1×10^{-7}	0.0000001
1×10^{3}	1,000	1×10^{-8}	0.00000001
1×10^{2}	100	1×10^{-9}	0.000000001
1×10^{1}	10	1×10^{-10}	0.0000000001