Gas Reference Standards

MESA
Specialty Gases & Equipment

RESTEK

2nd Source TO-14A/TO-15 Gas Calibration Standards

- Standards from TWO manufacturers provide second source on one order.
- 12 month stability in transportable cylinders.
- Drop shipped for fast delivery and maximum shelf life.

A. Spectra (Linde) 104L Cylinders

B. Scotty (Air Liquide) 110L Cylinders (Pi-marked Cylinders for EU Regulations)

For regulators,

Gas Regulators

Environmental Air Monitoring Gas Standards

Our high-quality air monitoring gas calibration standards are provided by Spectra/Linde and Scott/Air Liquide—meeting lab requirements for two separate sources of calibration standards. Mixes are produced gravimetrically using NIST (National Institute of Science and Technology) traceable weights. Each comes with a Certificate of Analysis and unique serial number. All cylinders are disposable and do not require rental or demurrage fees. Recertification of cylinders is available directly with our suppliers. All cylinders are drop-shipped from our suppliers to provide fast delivery and the "freshest" standard possible. 12-month stability on all cylinders unless otherwise specified.

TO-14A Calibration Mix (39 components)

benzene
bromomethane
carbon tetrachloride
chlorobenzene
chloroform
chloromethane
1,2-dibromoethane
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
dichlorodifluoromethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dichlorotetrafluoroethane
ethyl benzene
ethyl chloride
hexachloro-1,3-butadiene
methylene chloride
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
trichlorofluoromethane
1,1,2-trichlorotrifluoroethane
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34400 (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34421 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34400-PI (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34421-PI (ea.)

TO-14A 41 Component Mix (41 components)

acrylonitrile
benzene
bromomethane
1,3-butadiene
carbon tetrachloride
chlorobenzene
chloroform
chloromethane
1,2-dibromoethane
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
dichlorodifluoromethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dichlorotetrafluoroethane
ethyl benzene
ethyl chloride
hexachloro-1,3-butadiene
methylene chloride
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
trichlorofluoromethane
1,1,2-trichlorotrifluoroethane
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34430 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34430-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34431 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34431-PI (ea.)

TO-14A 43 Component Mix (43 components)

acrylonitrile
benzene
bromomethane
1,3-butadiene
carbon tetrachloride
chlorobenzene
chloroform
chloromethane
3-chloropropene
1,2-dibromoethane
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
dichlorodifluoromethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dichlorotetrafluoroethane
ethyl benzene
ethyl chloride
4-ethyltoluene
hexachloro-1,3-butadiene
methylene chloride
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
trichlorofluoromethane
1,1,2-trichlorotrifluoroethane
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34432 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34432-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34433 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34433-PI (ea.)

please **note**

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

2nd Source TO-14A/TO-15 Gas Calibration Standards

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- 12 month stability in transportable cylinders.
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A. Spectra (Linde) 104L Cylinders

B. Scotty (Air Liquide) 110L Cylinders (Pi-marked Cylinders for EU Regulations)

For regulators, see page 433.

For more available gas standards, visit **www. restek.com/air**

Gas Calibration Standards

TO-14A GC/MS Tuning Mix

4-bromofluorobenzene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34406 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34406-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34424 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34424-PI (ea.)

TO-14A Aromatics Mix (14 components)

benzene
chlorobenzene
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
ethyl benzene
styrene
toluene
1,2,4-trichlorobenzene
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34404 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34404-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34423 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34423-PI (ea.)

TO-14A Chlorinated Hydrocarbon Mix (19 components)

carbon tetrachloride
chloroform
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethylene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
ethyl chloride
hexachloro-1,3-butadiene
methyl chloride
methylene chloride
1,1,2,2-tetrachloroethane
tetrachloroethylene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
vinyl chloride

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34402 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34402-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34422 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34422-PI (ea.)

TO-14A Internal Standard Mix (3 components)

bromochloromethane
chlorobenzene-d5
1,4-difluorobenzene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34412 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34412-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34427 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34427-PI (ea.)

TO-14A Internal Standard/Tuning Mix (4 components)

bromochloromethane
1-bromo-4-fluorobenzene
(4-bromofluorobenzene)
chlorobenzene-d5
1,4-difluorobenzene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34408 (ea.) $690

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34408-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34425 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34425-PI (ea.)

TO-15 Subset 25 Component Mix (25 components)

acetone
allyl chloride
benzyl chloride*
bromodichloromethane
bromoform
1,3-butadiene
2-butanone (MEK)
carbon disulfide*
cyclohexane
dibromochloromethane
trans-1,2-dichloroethene
1,4-dioxane
ethyl acetate
4-ethyltoluene
heptane
hexane
2-hexanone (MBK)
4-methyl-2-pentanone
methyl *tert*-butyl ether (MTBE)
2-propanol
propylene
tetrahydrofuran
2,2,4-trimethylpentane
vinyl acetate
vinyl bromide

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34434 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34434-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34435 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34435-PI (ea.)

*Stability of this compound cannot be guaranteed.

TO-15 65 Component Mix (65 components)

acetone
acrolein
benzene
benzyl chloride*
bromodichloromethane
bromoform
bromomethane
1,3-butadiene
2-butanone (MEK)
carbon disulfide*
carbon tetrachloride
chlorobenzene
chloroethane
chloroform
chloromethane
cyclohexane
dibromochloromethane
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
trans-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
1,4-dioxane
ethanol*
ethyl acetate
ethyl benzene
ethylene dibromide
(1,2-dibromoethane)
4-ethyltoluene
trichlorofluoromethane (Freon 11)
dichlorodifluoromethane (Freon 12)
1,1,2-trichloro-1,2,2-trifluoroethane
(Freon 113)
1,2-dichlorotetrafluoroethane
(Freon 114)
heptane
hexachloro-1,3-butadiene
hexane
2-hexanone (MBK)
4-methyl-2-pentanone (MIBK)
methylene chloride
methyl *tert*-butyl ether (MTBE)
methyl methacrylate
naphthalene
2-propanol
propylene
styrene
1,1,2,2-tetrachloroethane
tetrachloroethene
tetrahydrofuran
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl acetate
vinyl chloride
m-xylene
o-xylene
p-xylene

Now with Naphthalene!

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34436 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34436-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34437 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34437-PI (ea.)

*Stability of this compound cannot be guaranteed.

TO-14A/TO-15/TO-17 Performance Test Standard

cylinder design

Performance Test Standard

Size: 5A disposable (3.2" x 12")
Volume/Pressure: 150L @ 1,800 psig
CGA 180 outlet fitting
Weight: 2.2 lbs

Restek is pleased to offer the Performance Testing/VOC Audit Sample Program in cooperation with Spectra/Linde. This is an on-going testing program in which laboratories, and/or other users of VOC standards, are able to evaluate their own capabilities, as well as compare their results and accuracy against other laboratories. As a participant in the program, you will receive a disposable cylinder, directly from Spectra/Linde, containing multiple unknown TO-14A/TO-15 components at varying concentrations that are to be identified, quantified, and reported via the Spectra/Linde P-T Audit Program forms. The results will be published and distributed for peer review. To ensure confidentiality, all participating laboratories will be anonymous, and only the individual laboratory will know their own results. To provide statistical analysis, the audit sample will be shipped to all laboratories at the same time, once a year during the fourth quarter.

150 liters @ 1,800psig
cat. # 34560 (ea.) $1040

BTEX Gas Mix (6 components)

benzene
ethylbenzene
toluene
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34414 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34414-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34428 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34428-PI (ea.)

BTEX and MTBE Gas Mix (7 components)

benzene
ethylbenzene
methyl *tert*-butyl ether (MTBE)
toluene
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34541 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34541-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34542 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34542-PI (ea.)

Higher Concentration = MORE STANDARD for your money!

please note

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

Sulfur 5-Component Mix (5 components)

12-month stability. +/- 10% accuracy.

carbonyl sulfide
dimethyl sulfide
ethyl mercaptan
hydrogen sulfide
methyl mercaptan

1ppm in nitrogen, 110 liters @ 1,800psi
cat. # 34561 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34561-PI (ea.)

Massachusetts APH Mix (26 components)

Now with Naphthalene!

benzene
1,3-butadiene
butylcyclohexane
cyclohexane
n-decane
2,3-dimethylheptane
2,3-dimethylpentane
n-dodecane
ethylbenzene
n-heptane
n-hexane
isopentane
isopropylbenzene
p-isopropyltoluene
methyl *tert*-butyl ether
1-methyl-3-ethylbenzene
naphthalene
n-nonane
n-octane
toluene
1,2,3-trimethylbenzene
1,3,5-trimethylbenzene
n-undecane
o-xylene
m/*p*-xylene (combined)

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34540 (ea.)

140-450ppb in nitrogen, 90 liters @ 1,500psig (Pi-marked Cylinder)
cat. # 34540-PI (ea.)

Japan Calibration Mix (9 components)

acrylonitrile
benzene
1,3-butadiene
chloroform
1,2-dichloroethane
dichloromethane
tetrachloroethylene
trichloroethylene
vinyl chloride

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34418 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34418-PI (ea.)

cylinder design

Spectra (Linde) 104L Cylinders:

Aluminum construction
Size: 8 x 24 cm
Volume/Pressure: 104 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 1.5 lbs/0.7 kg

See page 433 for regulators.

Scotty (Air Liquide) 110L Cylinders (Pi-marked Cylinders for EU Regulations):

Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure: 110 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 2.2 lbs/1 kg
US DOT Specs: 3AL2216

did you know?

Pi-marked Gas Cylinders for EU Countries

Our Pi-marked gas standards from Scott/Air Liquide meet the requirements of the Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

Gas Calibration Standards

Ozone Precursor Mixture/PAMS (57 components)

acetylene	isopropylbenzene
benzene	methylcyclohexane
n-butane	methylcyclopentane
1-butene	2-methylheptane
cis-2-butene	3-methylheptane
trans-2-butene	2-methylhexane
cyclohexane	3-methylhexane
cyclopentane	2-methylpentane
n-decane	3-methylpentane
m-diethylbenzene	*n*-nonane
p-diethylbenzene	*n*-octane
2,2-dimethylbutane	*n*-pentane
2,3-dimethylbutane	1-pentene
2,3-dimethylpentane	*cis*-2-pentene
2,4-dimethylpentane	*trans*-2-pentene
n-dodecane	propane
ethane	*n*-propylbenzene
ethylbenzene	propylene
ethylene	styrene
m-ethyltoluene	toluene
o-ethyltoluene	1,2,3-trimethylbenzene
p-ethyltoluene	1,2,4-trimethylbenzene
n-heptane	1,3,5-trimethylbenzene
n-hexane	2,2,4-trimethylpentane
1-hexene	2,3,4-trimethylpentane
isobutane	*n*-undecane
isopentane	*o*-xylene
isoprene	*m*/*p*-xylene (combined)

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34420 (ea.)

1ppm in nitrogen, 30 liters @ 500psi (Pi-marked Cylinder)
cat. # 34420-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34429 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34429-PI (ea.)

Ozone Precursor/PAMS Mix

(57 components at EPA concentrations: ppbC)

acetylene	40	isopropylbenzene	40
benzene	30	methylcyclohexane	30
n-butane	40	methylcyclopentane	25
1-butene	30	2-methylheptane	25
cis-2-butene	35	3-methylheptane	25
trans-2-butene	25	2-methylhexane	25
cyclohexane	40	3-methylhexane	25
cyclopentane	20	2-methylpentane	20
n-decane	30	3-methylpentane	40
m-diethylbenzene	40	*n*-nonane	25
p-diethylbenzene	25	*n*-octane	30
2,2-dimethylbutane	40	*n*-pentane	25
2,3-dimethylbutane	50	1-pentene	25
2,3-dimethylpentane	50	*cis*-2-pentene	35
2,4-dimethylpentane	40	*trans*-2-pentene	25
n-dodecane	40	propane	40
ethane	25	*n*-propylbenzene	30
ethylbenzene	25	propylene	25
ethylene	20	styrene	40
m-ethyltoluene	25	toluene	40
o-ethyltoluene	30	1,2,3-trimethylbenzene	25
p-ethyltoluene	40	1,2,4-trimethylbenzene	40
n-heptane	25	1,3,5-trimethylbenzene	25
n-hexane	30	2,2,4-trimethylpentane	30
1-hexene	60	2,3,4-trimethylpentane	25
isobutane	25	*n*-undecane	30
isopentane	40	*o*-xylene	25
isoprene	40	*m*/*p*-xylene (combined)	40

20-60ppbC in nitrogen, 104 liters @ 1,800psi
cat. # 34445 (ea.)

20-60ppbC in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34445-PI (ea.)

24129

Small Cylinder Stand

- Supports and stabilizes disposable gas cylinders.
- Fits cylinders up to 3⅜" (8 cm) in diameter.
- Adjustable screw secures cylinder in place.

This cylinder stand is designed to support small diameter cylinders, such as 104 L and 110 L disposable cylinders. It is a simple, safe, and economical way to stabilize the position of small cylinders, while keeping them within close proximity. The stand is constructed of heavyweight painted steel and includes an adjustable screw for safely securing cylinders.

Description	qty.	cat.#	price
Small Cylinder Stand	ea.	24129	

2nd Source TO-14A/TO-15 Gas Calibration Standards

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- 12 month stability in transportable cylinders.
- Drop shipped for fast delivery and maximum shelf life.

A. Spectra (Linde) 104L Cylinders

B. Scotty (Air Liquide) 110L Cylinders (Pi-marked Cylinders for EU Regulations)

For regulators, see page 433.

For more available gas standards, visit **www. restek.com/air**

Natural Gas and Refinery Gas Standards

- Each available in three varying concentrations.
- Mini-regulator designed specially for these standards.

Natural Gas Standards

Available in three mixes, from lean to rich. Each has an extended list of C6+ components.

	Natural Gas Standard #1 cat.# 34438, ea. % each compound**	Natural Gas Standard #2 cat.# 34439, ea. % each compound**	Natural Gas Standard #3 cat.# 34440, ea. % each compound**
nitrogen	1.000	2.500	5.000
carbon dioxide	0.500	1.000	1.500
methane UHP	94.750	85.250	70.000
ethane UHP	2.000	5.000	9.000
propane	0.750	3.000	6.000
isobutane	0.300	1.000	3.000
n-butane	0.300	1.000	3.000
isopentane	0.150	0.500	1.000
n-pentane	0.150	0.500	1.000
hexanes plus*	0.100	0.250	0.500
Concentration	mole	mole	mole
Volume	13.16L @ 200psig	13.16L @ 200psig	5.5L @ 75psig
Ideal Heating Value (Dry BTU/SCF)	1048 gross	1142 gross	1317 gross

Refinery Gas Standards

Available in three mixes with varying C5 unsaturates or extended C6+ components.

	Refinery Gas Standard #1 cat.# 34441, ea. % each compound**	Refinery Gas Standard #2 cat.# 34442, ea. % each compound**	Refinery Gas Standard #5 cat.# 34443, ea. % each compound**
hydrogen	40.750	12.500	12.500
argon	0.500	1.000	1.000
nitrogen	4.000	37.200	37.200
carbon monoxide	1.000	1.000	1.000
carbon dioxide	3.000	3.000	3.000
methane	8.500	5.000	5.000
ethane	6.000	4.000	4.000
ethylene	2.000	2.000	2.000
acetylene	—	1.000	1.000
propane	7.000	6.000	6.000
propylene	3.000	3.000	3.000
propadiene	0.850	1.000	1.000
cyclopropane	—	0.040	—
isobutane	6.000	5.000	5.000
n-butane	4.000	4.000	4.000
isobutylene	2.000	1.000	1.000
1,3 butadiene	3.000	3.000	3.000
cis-2-butene	2.000	2.000	2.000
trans-2-butene	2.000	3.000	3.000
butene-1	2.000	2.000	2.000
2-methyl-2-butene	—	0.200	0.200
isopentane	1.000	1.000	1.000
n-pentane	1.000	1.000	1.000
cis-2-pentene	—	0.400	0.400
trans-2-pentene	—	0.160	0.200
pentene-1	—	0.400	0.400
n-hexane	0.500	0.100	—
hexanes plus	—	—	0.100
Concentration	mole	mole	mole
Volume	5.2L @ 70psig	4.9L @ 60psig	4.6L @ 60psig

*Contact Restek or your Restek representative for a complete list of hexanes plus.
**Precise concentrations are provided on the data sheet included with each cylinder and may vary slightly from those listed here.

please note

Gas standards on this page are not available in Pi-marked cylinders for EU countries.

cylinder design

DCG Partnership Cylinders:

Size: 7.6 x 24 cm
CGA-170/110 connection.
US DOT Specs: DOT-4B-240ET

Please note: This cylinder is not approved for use in Canada.

also available

See page 433 for regulators.

Scott/Air Liquide Transportable Pure Gases and Mixtures

We offer a wide range of Scott/Air Liquide transportable gases, from pure gases for purging or calibrating to multi-component mixes which are ideal for peak identification work.

The 14-liter container has a CGA 160 connection for more precise integration with analytical systems. The 48-liter cylinder has a CGA 165 connection, and can deliver large volumes of sample. The 110-liter cylinder has a CGA 180 connection.

See regulators pages 433-434 for cylinder information.

Description	Shelf Life	Scotty 14 (14 Liter) cat.#	price	Scotty 48 (48 Liter) cat.#	price	Scotty 110 (110 Liter) cat.#	price
Pure Gases							
Air, zero (THC < 1ppm)	2 yrs.	34448		34449		34449-PI	
Argon, 99.995%	2 yrs.	34457		—	—	34457-PI	
Carbon dioxide, 99.80%	2 yrs.	34451		34452		34452-PI	
Hydrogen, 99.99%	2 yrs.	34453		—	—	34453-PI	
Methane, 99.00%	2 yrs.	34454		—	—	34454-PI	
Oxygen, 99.60%	2 yrs.	34455		—	—	—	—
Two-Component Mixtures							
Benzene in air (1ppm)	1 yr.	—	—	34458		34458-PI	
Benzene in air (100ppm)	1 yr.	—	—	34459		34459-PI	
1,3-Butadiene in nitrogen (10ppm)	2 yrs.	34460		34461		34461-PI	
Carbon dioxide in helium (100ppm)	2 yrs.	34462		—	—	34462-PI	
Carbon dioxide in nitrogen (100ppm)	2 yrs.	34463		34464		34464-PI	
Carbon dioxide in nitrogen (1000ppm)	2 yrs.	34465		34466		34466-PI	
Ethylene in air (8-10ppm)	2 yrs.	34467		34468		34468-PI	
Ethylene in helium (100ppm)	2 yrs.	34489		—	—	34489-PI	
Hydrogen in helium (100ppm)	2 yrs.	34469		—	—	34469-PI	
Hydrogen in nitrogen (1%)	2 yrs.	34471		34472		34472-PI	
Hydrogen in nitrogen (100ppm)	2 yrs.	34473		34474		34474-PI	
Methane in helium (100ppm)	2 yrs.	34476		34477		34477-PI	
Methane in nitrogen (100ppm)	2 yrs.	34478		—	—	34478-PI	
Methane in nitrogen (1%)	2 yrs.	34482		34483		34483-PI	
Nitrogen in helium (100ppm)	2 yrs.	34479		—	—	34479-PI	
Nitrous oxide in nitrogen (1ppm)	2 yrs.	34484		34485		34485-PI	
Oxygen in helium (100ppm)	2 yrs.	34480		—	—	34480-PI	
Oxygen in nitrogen (2%)	2 yrs.	34487		34488		34488-PI	
Oxygen in nitrogen (6%)	2 yrs.	34491		34492		34492-PI	
1,1,1-Trichloroethane in nitrogen (10ppm)	2 yrs.	—		34493		34493-PI	
Trichloroethylene in nitrogen (10ppm)	2 yrs.	34494		34495		34495-PI	
Vinyl chloride in nitrogen (1ppm)	2 yrs.	34496		34497		34497-PI	
Vinyl chloride in nitrogen (10ppm)	2 yrs.	34498		34499		34499-PI	
Vinyl chloride in nitrogen (50ppm)	2 yrs.	34500		—	—	34500-PI	
Vinyl chloride in nitrogen (100ppm)	2 yrs.	34501		—	—	34501-PI	
Vinyl chloride in nitrogen (1000ppm)	2 yrs.	34502		—	—	34502-PI	
Multi-Component Mixtures							
Carbon monoxide, carbon dioxide, hydrogen and oxygen in nitrogen (0.5% each)	2 yrs.	34504		34505		34505-PI	
Carbon monoxide, carbon dioxide, hydrogen and oxygen in nitrogen (1% each)	2 yrs.	34507		34508		34508-PI	
Carbon monoxide, carbon dioxide, methane, ethane, ethylene and acetylene in nitrogen (1% each)	1 yr.	—	—	34511		34511-PI	
Carbon monoxide, carbon dioxide, nitrogen, and oxygen, (5% each) and methane and hydrogen (4% each) in helium	2 yrs.	34512		—	—	34512-PI	
Carbon monoxide (7%), carbon dioxide (15%) and oxygen (5%) in nitrogen	2 yrs.	34514		—	—	34514-PI	
Carbon monoxide (7%), oxygen (4%), carbon dioxide (15%) and methane (4.5%) in nitrogen	2 yrs.	34515		34516		34516-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (15ppm each)	2 yrs.	34518		34519		34519-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (100ppm each)	2 yrs.	34521		34522		34522-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (1000ppm each)	2 yrs.	34524		34525		34525-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (100ppm each)	2 yrs.	34527		34528		34528-PI	
C2-C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in helium (100ppm each)	2 yrs.	34529		34530		34530-PI	
C2-C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in nitrogen (100ppm each)	2 yrs.	34531		34532		34532-PI	
Branched Paraffins: 2,2-dimethylbutane, 2,2-dimethylpropane, isobutane, 2-methylbutane, 2-methylpentane, 3-methylpentane in nitrogen (15ppm each)	2 yrs.	34534		—	—	34534-PI	
Methane, ethane, ethylene, acetylene, propane, propylene, *n*-butane, propyne in nitrogen (15ppm each)	1 yr.	—	—	34537		34537-PI	
n-butane, isobutane, *cis*-2-butene, *trans*-2-butene, 1-butene, iso-butylene, 1,3-butadiene, ethyl acetylene in nitrogen (15ppm each)	1 yr.	—	—	34539		34539-PI	

Gas Regulators for Transportable Cylinders

For this cylinder:

DCG Partnership Cylinders:
Size: 7.6 x 24 cm
CGA-170/110 connection.
US DOT Specs: DOT-4B-240ET

Please note: This cylinder is not approved for use in Canada.

Use this regulator:

Mini-Regulator for natural gas and refinery gas standards
- 0–300 psig inlet pressure range.
- 0–15 psig outlet pressure range.
- Supplied with 0–15 psig outlet pressure gauge, brass CGA 170 nut and nipple.


22032

Description	qty.	cat.#	price
Mini-Regulator	ea.	22032	

For these cylinders:

Spectra (Linde) 104L:
Aluminum construction
Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800 psi
CGA-180 outlet fitting.
Weight: 1.5 lbs/0.7 kg

Scotty® (Air Liquide) 110L
(Pi-marked Cylinders for EU Regulations):
Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 2.2 lbs/1 kg
DOT Specifications: 3AL2216

Use these regulators:

Spectra Gas 7621 High-Purity VOC Regulator
- Single-stage, stainless steel.
- Two pressure gauges and CGA-180 fitting.
- 3,000 psig maximum inlet pressure.
- Stainless steel diaphragm and Kel-F® seat.
- 1/8-inch tube compression outlet.
- Low internal volume: 3.03 cc.
- Accurate pressure control even at low flow rates.
- Individually tested for leaks and impurities.


21572

Description	qty.	cat.#	price
0–30psig outlet pressure gauge	ea.	21572	
0–100psig outlet pressure gauge	ea.	21572-R100	

See next page for a syringe adapter kit.

Continued on next page.

For these cylinders:

Scotty® (Air Liquide) 14
Contents: 14 liters
Pressure: 240 psig (17 bar)
Outlet Fitting: CGA 160
Weight: 1.5 lbs/0.7 kg
Dimensions: 3" diameter x 11" height (7.6 x 28 cm)
DOT Specifications: 4B240
Please note: This cylinder is not approved for use in Canada.

Scotty® (Air Liquide) 48
Contents: 48 liters
Pressure: 300 psig (21 bar)
Outlet Fitting: CGA 165
Weight: 1.75 lbs/0.8 kg
Dimensions: 4" diameter x 16 1/4" height (10.2 x 41 cm)
DOT Specifications: 39 NRC

Use these regulators:

Regulators
for use with 14-liter and 48-liter Scott (Air Liquide) Transportable Gases

Specifications:
Maximum Inlet Pressure: 300 psig
Outlet Pressure Range: 2–10 psig
Maximum Delivery Pressure: 25 psig
Operating Temperature Range: 35 °F to 150 °F (2 °C to 65 °C)
Outlet Connection: 1/4" female NPT

Materials of Construction:
Body: Brass
Diaphragm: Viton®
Seat: Acetal
Seal: Viton®


22690

Use the CGA 160 inlet connection with 14-liter Scott/Air Liquide Transportable Gases. Use the CGA 165 inlet connection with 48-liter Scott/Air Liquide Transportable Gases.

Description	qty.	cat.#	price
Regulator, CGA 160 Inlet Connection	ea.	22690	
Regulator, CGA 165 Inlet Connection	ea.	22691	


21118

Syringe Adapter Kit for Single-Stage VOC Regulator
Use to withdraw sample from a high-pressure cylinder after pressure reduction through the high-purity VOC single-stage regulator.

Kit contains one nickel-plated brass 1/4" NPT to female luer fitting, which can be used with an A-2 Luer syringe (cat.# 20162 or 20163, see page 385), and one stainless steel 1/4" NPT x 1/8" compression fitting with septum (can be used with any syringe needle).

Description	qty.	cat.#	price
Syringe Adapter Kit	kit	21118	

also **available**

Single-Stage and Dual-Stage Ultra-High Purity Gas Regulators
See pages 309–311.

Quality...

It is the guiding principle of MESA Specialty Gas and equipment to offer only the highest quality calibration gas products to our customers.

Service...

We recognize that only excellent customer service will allow our growth in this highly competitive calibration gas industry.

Support...

MESA Specialty Gas offers technical support through top experts in the field. Let us know how we can assist you.

Specialty Gas Product Specifications

MESA Specialty Gases offers three types of product grade available for your calibration gas standard, Primary, Certified and Gravimetric Standards.

The Primary Standard is the most accurate and is made by weight. Unless stated otherwise, the specialty gas mixture is certified to ± 1% analytical accuracy of the numbers reported.

The Certified Standard is made by a combination of pressure and/or weight measurements. Unless stated otherwise, the calibration gas mixture is certified to ± 2% analytical accuracy of the numbers reported.

In the case of all specialty gas products, final calibration gas mixtures are analyzed by gas chromatography or other suitable analytical methodology to confirm they are within the allowed tolerances. All calibration gas mixtures are supplied with a "Certificate of Analysis" that details the requested and analytical values as well as preparative and analytical methods used by MESA Specialty Gases to prepare the calibration gas standard.

STANDARD SPECIFICATIONS FOR CALIBRATION GAS, SPECIALTY GAS, NATURAL GAS, PETROCHEMICAL AND REFINERY GAS STANDARDS

Product Grade	Blend Tolerance	Blend Tolerance (1)	Certification Accuracy (1)
Primary	Below 5 ppm (2)	±10 to 15%	±1 to 2%
	5-100 ppm	±5%	±1%
	101-5000 ppm	±5%	±1%

	Above 0.5%	±5%	±1% (1)
Certified	Below 5 ppm (2)	±15-20%	±2-5%
	5-100 ppm	±10%	±2%
	101-5000 ppm	±10%	±2%
	Above 0.5%	±5%	±2%
Gravimetric (3)	0-100 ppm	±20%	Non-Certified by independent laboratory analysis. Concentration Ranges are reported based on the gravimetric values.
	101-5000 ppm	±10%	
	Above 0.5%	±5%	

1. The Blend Tolerances and Certification Accuracy are expressed as the relative percentage deviation from the requested concentration of the individual components. Certification Accuracy for Primary Standards over 2% concentration will be ± 0.02% absolute of the reported value.
2. Tolerances of minor components below 5ppm may vary depending on the component and the complexity of the mixture.
3. Each component is reported at the requested concentration ± the % stated for the concentration range.

Specialty Gases & Equipment

It is the guiding principle of MESA Specialty Gas and equipment to offer only the highest quality calibration gas products to our customers.

Service...

We recognize that only excellent customer service will allow our growth in this highly competitive calibration gas industry.

Support...

MESA Specialty Gas offers technical support through top experts in the field. Let us know how we can assist you.

Quality...

Natural Gas and BTU Standards

The following BTU mixes are held in inventory and are available for immediate delivery in small disposable cylinders. For cylinder information, please see cylinder specifications for the 20L and 14L Cylinder. The recommended regulator for use with the 20L and 14L is a Series 300 regulator.

STOCK #:	K2I5585	03143	360816	M-03085	99282	X-20987
COMPONENTS	***CONCENTRATION***	***CONCENTRATION***	***CONCENTRATION***	***CONCENTRATION***	***CONCENTRATION***	***CONCENTRATION***
NITROGEN	1.53%	2.39%	0.23%	0.95%	9.11%	0.23%
CARBON DIOXIDE		1.91%	10.05%	6.91%	2.97%	10.44%
METHANE	BALANCE	BALANCE	BALANCE	BALANCE	BALANCE	BALANCE
ETHANE	2.49%	4.80%	4.19%	6.50%	2.94%	9.95%
PROPANE	2.51%	0.973%	1.87%	4.63%	1.00%	4.01%
ISO-BUTANE	0.50%	0.286%	0.880%	0.919%	0.398%	0.890%
N-BUTANE	2.00%	0.288%	0.301%	0.920%	1.010%	0.837%
NEOPENTANE					0.100%	
ISO-PENTANE	0.301%	0.095%	0.210%	0.461%	0.201%	0.398%
N-PENTANE	0.500%	0.095%	0.110%	0.463%	0.397%	0.349%
HEXANE	0.201%	0.077%	0.372%	0.324%	0.050%	0.298%
HEPTANE		0.006%				
LIST IN 14L (AUD)	504.00	616.00	560.00	560.00	616.00	560.00
LIST IN 20L (AUD)	567.00	693.00	630.00	630.00	69300	630.00

The following RGA mixes are held in inventory and are available for immediate delivery in small disposable cylinders. For cylinder information, please see cylinder specifications for the 20L and 14L Cylinder. The recommended regulator for use with the 20L and 14L is a Series 300 regulator.

STOCK #:	47968AW	32286AW	8994AW
COMPONENTS	*CONCENTRATION*	*CONCENTRATION*	*CONCENTRATION*
HELIUM			
HYDROGEN	BALANCE	3.26%	12.01%
NITROGEN	3.91%	BALANCE	BALANCE
OXYGEN			
ARGON	0.49%	0.17%	0.99%
CARBON MONOXIDE	0.98%		1.01%
CARBON DIOXIDE	2.94%	0.10%	3.02%
METHANE	8.23%	1.99%	5.00%
ETHANE	5.84%	0.51%	3.99%
PROPANE	6.83%	0.94%	5.95%
CYCLOPROPANE	0.05%		0.03%
ISO-BUTANE	4.91%	2.07%	5.14%
N-BUTANE	3.86%	0.54%	3.98%
NEOPENTANE			
ISO-PENTANE	0.97%	1.48%	0.99%
N-PENTANE	0.98%	0.49%	0.98%
HEXANE	0.49%	0.59%	0.10%
ETHYLENE	1.97%	0.51%	1.96%
ACETYLENE	1.94%		1.00%
PROPYLENE	1.95%	2.36%	2.99%
PROPADIENE	1.76%		0.99%
1-BUTENE	1.96%	0.62%	2.00%
CIS-2-BUTENE	1.96%	0.90%	0.99%
TRANS-2-BUTENE	1.95%	1.09%	2.96%
ISOBUTYLENE	1.94%	1.05%	0.99%
1,2-BUTADIENE			
1,3-BUTADIENE	2.91%	0.12%	3.04%
METHYL ACETYLENE			
VINYL ACETYLENE			
ETHYL ACETYLENE			
1-PENTENE		0.59%	0.39%
TRANS-2-PENTENE		0.30%	0.20%
CIS-2-PENTENE		0.20%	0.30%
2-METHYL-2-BUTENE		0.41%	0.19%
2-METHYL-1-BUTENE			
3-METHYL-1-BUTENE		0.14%	

3-METHYL-1,2-BUTADIENE			
LIST IN 14L (AUD)	966.00	1008.00	1134.00
LIST IN 20L (AUD)	1127.00	1176.00	1323.00

MESA CALIBRATION GASES
Gas PRODUCT LIST

CGA FITTINGS: ***17, 34 LITER - CGA 600***
103 LITER - CGA C-10
221 LITER - CGA 165; 550 LITER - VARIES WITH GAS
29, 58, & 76* LITER - CGA C-10 *(76 LITER OFFERED WITH CGA 170)

OLD PART #	*NEW PART #*	*DESCRIPTION*
		AIR ZERO
17 liter cylinders		
P1002	P1002	Zero Air
34 liter cylinders		
HP1002	H1002	Zero Air
103 liter cylinders		
1002	J1002	Zero Air
221 liter cylinders		
IM1002	M1002	Zero Air
550 liter cylinders		
E1002	E1002	Zero Air
		AMMONIA (NH3)
29 liter cylinders		
F100525	F100525PN	25 ppm / N2
F100550A	F100550PA	50 ppm / Air
F100550	F100550PN	50 ppm / N2
58 liter cylinders		
Z100510	Z100510PN	10 ppm / N2
Z100525A	Z100525PA	25 ppm / Air
Z100525	Z100525PN	25 ppm / N2
Z100550A	Z100550PA	50 ppm / Air
Z100550	Z100550PN	50 ppm / N2
Z1005100A	Z1005100PA	100 ppm / Air
Z1005100	Z1005100PN	100 ppm / N2
Z1005150	Z1005150PN	150 ppm / N2
Z1005200	Z1005200PN	200 ppm / N2
Z1005250	Z1005250PN	250 ppm / N2
Z1005300	Z1005300PN	300 ppm / N2
76 liter cylinders		
X100550	X100550PN	50 ppm / N2
X1005100	X1005100PN	100 ppm / N2
		BENZENE
58 liter cylinders		
Z11145N	Z11145PN	5 ppm / N2
Z11145	Z11145PA	5 ppm / Air
Z111450N	Z111450PN	50 ppm / N2
Z111450	Z111450PA	50 ppm / Air
		BTEX MIXTURES
76 liter cylinders		
XD111410MX	XD111410PM2	10 ppm Benzene, Toluene Ethylbenzene, o-Xylene / N2
XD111420MX3	XD111420PM3	20 ppm Benzene, Toluene Ethylbenzene, o-Xylene / N2
		Other concentrations available
		N-BUTANE
17 liter cylinders		
P10118N	P10118VN	8% / N2
P101125	P101125LA	25% LEL / Air
P101150	P101150LA	50% LEL / Air
34 liter cylinders		
HP101125	H101125LA	25% LEL / Air
HP101150	H101150LA	50% LEL / Air
103 liter cylinders		
101125	J101125LA	25% LEL / Air
101150	J101150LA	50% LEL / Air

CARBON DIOXIDE (CO2)

17 liter cylinders		
P1013500N	P1013500PN	500 ppm / N2
P1013700N	P1013700PN	700 ppm / N2
P1013800N	P1013800PN	800 ppm / N2
P10131000N	P10131000PN	1000 ppm/ N2
P10132000N	P10132000PN	2000 ppm / N2
34 liter cylinders		
HP1013700N	H1013700PN	700 ppm / N2
HP10131000N	H10131000PN	1000 ppm / N2
HP10135N	H10135VN	5% by Volume / N2
103 liter cylinders		
1013100N	J1013100PN	100 ppm / N2
1013200N	J1013200PN	200 ppm / N2
10131000MX	J101650PM3	1000 ppm / CO 50 ppm / Air
10131000N	J10131000PN	1000 ppm / N2
10132000N	J10132000PN	2000 ppm / N2
101325N	J10132.5VN	2.5% by Volume / N2
10135N	J10135VN	5% by Volume / N2
101310N	J101310VN	10% by Volume / N2
221 liter cylinders		
IM10131000N	M10131000PN	1000 ppm / N2
IM10132000N	M10132000PN	2000 ppm / N2

CARBON MONOXIDE (CO)

17 liter cylinders		
P101610	P101610PA	10 ppm / Air
P101620	P101620PA	20 ppm / Air
P101625	P101625PA	25 ppm / Air
P101635	P101635PA	35 ppm / Air
P101640	P101640PA	40 ppm / Air
P101650	P101650PA	50 ppm / Air
P101650N	P101650PN	50 ppm / N2
P101660	P101660PA	60 ppm / Air
P1016100	P1016100PA	100 ppm / Air
P1016100N	P1016100PN	100 ppm / N2
P1016200	P1016200PA	200 ppm / Air
P1016200N	P1016200PN	200 ppm / N2
P1016250	P1016250PA	250 ppm / Air
P1016300	P1016300PA	300 ppm / Air
P1016400	P1016400PA	400 ppm / Air
34 liter cylinders	H101610PA	10 ppm / Air
HP101620	H101620PA	20 ppm / Air
HP101625	H101625PA	25 ppm / Air
HP101635	H101635PA	35 ppm / Air
HP101640	H101640PA	40 ppm / Air
HP101650	H101650PA	50 ppm / Air
HP101650N	H101650PN	50 ppm / N2
HP101660	H101660PA	60 ppm / Air
HP1016100	H1016100PA	100 ppm / Air
HP1016100N	H1016100PN	100 ppm / N2
HP1016150	H1016150PA	150 ppm / Air
HP1016200	H1016200PA	200 ppm / Air
HP1016200N	H1016200PN	200 ppm / N2
HP1016250	H1016250PA	250 ppm / Air
HP1016300	H1016300PA	300 ppm / Air
HP1016400	H1016400PA	400 ppm / Air
103 liter cylinders		
101610	J101610PA	10 ppm / Air
101620	J101620PA	20 ppm / Air
101625	J101625PA	25 ppm / Air
101635	J101635PA	35 ppm / Air
101640	J101640PA	40 ppm / Air
101650	J101650PA	50 ppm / Air
101650N	J101650PN	50 ppm / N2
101660	J101660PA	60 ppm / Air
101660N	J101660PN	60 ppm / N2
101675	J101675PA	75 ppm / Air

CARBON MONOXIDE (CO)

103 Liter cylinders

101680	J101680PA	80 ppm / Air
101680N	J101680PN	80 ppm / N2
1016100	J1016100PA	100 ppm / Air
1016100N	J1016100PN	100 ppm / N2
1016150	J1016150PA	150 ppm / Air
1016200	J1016200PA	200 ppm / Air
1016200N	J1016200PN	200 ppm / N2
1016250	J1016250PA	250 ppm / Air
1016300	J1016300PA	300 ppm / Air
1016400	J1016400PA	400 ppm / Air
1016400N	J1016400PN	400 ppm / N2
1016500	J1016500PA	500 ppm / Air
1016500N	J1016500PN	500 ppm / N2
10161000N	J10161000PN	1000 ppm / N2

550 liter cylinders

E101620	E101620PA	20 ppm / Air
E101650	E101650PA	50 ppm / Air
E1016100	E1016100PA	100 ppm / Air
E1016250	E1016250PA	250 ppm / Air

CHLORINE (CL2)

29 liter cylinders

FB10175	FB10175PN	5 ppm / N2
FB101710	FB101710PN	10 ppm / N2

58 liter cylinders

ZB10175	ZB10175PN	5 ppm / N2
ZB101710	ZB101710PN	10 ppm / N2

ETHYLENE

17 liter cylinder

P196212	P196212PA	12 ppm / Air
P196227	P196227PA	27 ppm / Air

ETHYLENE OXIDE (ETO)

58 liter cylinders

Z10405	Z10405PN	5 ppm / N2
Z104010	Z104010PN	10 ppm / N2
Z104050	Z104050PN	50 ppm / N2

CFC'S/HCFC'S/HFC'S (REFRIGERANTS)

103 liter cylinders

		R-11
251710N	J251710PN	10 ppm / N2
251730N	J251730PN	30 ppm / N2
2517100N	J2517100PN	100 ppm / N2
		R-12
102810N	J102810PN	10 ppm / N2
102830N	J102830PN	30 ppm / N2
1028100N	J1028100PN	100 ppm / N2
		R-22
101810N	J101810PN	10 ppm / N2
101830N	J101830PN	30 ppm / N2
1018100	J1018100PA	100 ppm / Air
1018100N	J1018100PN	100 ppm / N2
		R-123
12310N	JR12310PN	10 ppm / N2
12330N	JR12330PN	30 ppm / N2
123100N	JR123100PN	100 ppm / N2
		R-134A
315910N	J315910PN	10 ppm / N2
315930N	J315930PN	30 ppm / N2
3159100N	J3159100PN	100 ppm / N2
3159100	J3159100PA	100 ppm / Air

HEXANE

17 Liter cylinders		
P120820	P120820LA	20% LEL / Air
P120825	P120825LA	25% LEL / Air
P120830	P120830LA	30% LEL / Air
P120840	P120840LA	40% LEL / Air
34 liter cylinders		
HP1208025	H120825PA	25 ppm / Air
HP1208050	H120850PA	50 ppm / Air
HP1208075	H120875PA	75 ppm / Air
HP1208100	H1208100PA	100 ppm / Air
HP1208400	H1208400PA	400 ppm / Air
HP1208500	H1208500PA	500 ppm / Air
HP120810	H120810LA	10% LEL / Air
HP120820	H120820LA	20% LEL / Air
HP120825	H120825LA	25% LEL / Air
HP120830	H120830LA	30% LEL / Air
103 liter cylinders		
1208025	J120825PA	25 ppm / Air
1208050	J120850PA	50 ppm / Air
1208100	J1208100PA	100 ppm / Air
1208500	J1208500PA	500 ppm / Air
120810	J120810LA	10% LEL / Air
120820	J120820LA	20% LEL / Air
120825	J120825LA	25% LEL / Air
120830	J120830LA	30% LEL / Air
221 liter cylinders		
IM120840	M120840LA	40% LEL / Air

HYDROGEN (H2)

17 liter cylinders		
P1049	P1049	100%
P10492000	P10492000PA	2000 ppm / Air
P104920	P104920LA	20% LEL (0.8% by Volume) / Air
P104925	P104925LA	25% LEL (1.0% by Volume) / Air
P104940	P104940LA	40% LEL (1.6% by Volume) / Air
P104950	P104950LA	50% LEL (2.0% by Volume) / Air
34 liter cylinders		
HP1049	H1049	100%
HP104920	H104920LA	20% LEL (0.8% by Volume) / Air
HP104925	H104925LA	25% LEL (1.0% by Volume / Air
HP104950	H104950LA	50% LEL (2.0% by Volume) / Air
103 liter cylinders		
104920	J104920LA	20% LEL (0.8% by Volume) / Air
104925	J104925LA	25% LEL (1.0% by Volume) / Air
104950	J104950LA	50% LEL (2.0% by Volume) / Air
1049100	J1049100PA	100 ppm / Air
1049500	J1049500PA	500 ppm / Air
10491000	J10491000PA	1000 ppm / Air
221 liter cylinders		
IM104950N	M10492VN	50% LEL (2.0% by Volume) / N2

HYDROGEN CYANIDE (HCN)

58 liter cylinders		
Z10515	Z10515PN	5 ppm / N2
Z105110	Z105110PN	10 ppm / N2
Z105120	Z105120PN	20 ppm / N2

HYDROGEN SULFIDE (H2S)

29 liter cylinders		
F105310	F105310PN	10 ppm / N2
F105310A	F105310PA	10 ppm / Air
F105325	F105325PN	25 ppm / N2
F105325A	F105325PA	25 ppm / Air
F105350	F105350PN	50 ppm / N2
F105350A	F105350PA	50 ppm / Air
F105310MX12	F105310PM12	10 ppm / Pentane Sim. 58% LEL (1.5% CH4) / CO 300 ppm / O2 15% / N2
F105310MX21	F105310PM21	10 ppm / Methane 50% LEL / CO 300 ppm / O2 15% / N2
F105310MX24	F105310PM24	10 ppm / Methane 50% LEL / CO 50 ppm / O2 20.9% / N2
F105325MX45	F105325PM45	25 ppm / Methane 50% LEL / CO 50 ppm / Air
F105325MX48	F105325PM48	25 ppm / Methane 50% LEL / CO 100 ppm / Air
F105325MX51	F105325PM51	25 ppm / Methane 50% LEL / CO 50 ppm / O2 12% / N2
F105325MX55	F105325PM55	25 ppm / Pentane 50% LEL / CO 50 ppm / O2 20.9% / N2
F105325MX57	F105325PM57	25 ppm / Propane Sim.50% LEL (1.62% CH4) / CO 50 ppm / O2 19% / N2
F105325MX58	F105325PM58	25 ppm / Pentane 25% LEL / CO 100 ppm / O2 19% / N2
F105325MX77	F105325PM77	25 ppm / Prop. Sim. 50% LEL (1.62% CH4) / CO 50 ppm / O2 18% / N2
F105340MX3	F105340PM3	40 ppm / Methane 50% LEL / CO 100 ppm / O2 15% / N2
F105320MX1	F105320PM1	20 ppm / Pentane sim. 58% LEL (1.5% CH4) / 60 ppm CO/ 15% O2/ N2
		Other mixtures available upon request

HYDROGEN SULFIDE (H2S)

58 liter cylinders

Z10535	Z10535PN	5 ppm / N2
Z10535A	Z10535PA	5 ppm / Air
Z105310	Z105310PN	10 ppm / N2
Z105310A	Z105310PA	10 ppm / Air
Z105320	Z105320PN	20 ppm / N2
Z105320A	Z105320PA	20 ppm / Air
Z105325	Z105325PN	25 ppm / N2
Z105325A	Z105325PA	25 ppm / Air
Z105330	Z105330PN	30 ppm / N2
Z105335	Z105335PN	35 ppm / N2
Z105340	Z105340PN	40 ppm / N2
Z105340A	Z105340PA	40 ppm / Air
Z105350	Z105350PN	50 ppm / N2
Z105350A	Z105350PA	50 ppm / Air
Z105360	Z105360PN	60 ppm/ N2
Z105390	Z105390PN	90 ppm / N2
Z1053100	Z1053100PN	100 ppm / N2
Z1053100A	Z1053100PA	100 ppm / Air
Z105310MX4	Z105310PM4	10 ppm / Pentane Sim. 58% LEL (1.5% CH4) / CO 60 ppm / O2 15% / N2
Z105310MX10	Z105310PM10	10 ppm / Pentane 10% LEL / CO 35 ppm / O2 18% / N2
Z105310MX12	Z105310PM12	10 ppm / Pent.Sim. 58% LEL (1.5% CH4) / CO 300 ppm / O2 15% / N2
Z105310MX17	Z105310PM17	10 ppm / Methane 10% LEL / CO 35 ppm / O2 18% / N2
Z105325MX35	Z105325PM35	25 ppm / Pentane 25% LEL / O2 19% / N2
Z105325MX37	Z105325PM37	25 ppm / Methane 50% LEL / O2 19% / N2
Z105325MX38	Z105325PM38	25 ppm / Methane 50% LEL / Air
Z105325MX42	Z105325PM42	25 ppm / Propane 50% LEL / CO 50 ppm / Air
Z105325MX43	Z105325PM43	25 ppm / Propane 50% LEL / CO 50 ppm / O2 19% / N2
Z105325MX44	Z105325PM44	25 ppm / Methane 50% LEL / CO 50 ppm / O2 19% / N2
Z105325MX45	Z105325PM45	25 ppm / Methane 50% LEL / CO 50 ppm / Air
Z105325MX46	Z105325PM46	25 ppm / Pentane 50% LEL / CO 50 ppm / O2 19% / N2
Z105325MX48	Z105325PM48	25 ppm / Methane 50% LEL / CO 100 ppm / Air
Z105325MX50	Z105325PM50	25 ppm / Pentane 25% LEL / CO 50 ppm / O2 19% / N2
Z105325MX51	Z105325PM51	25 ppm / Methane 50% LEL / CO 50 ppm / O2 12% / N2
Z105325MX55	Z105325PM55	25 ppm / Pentane 50% LEL / CO 50 ppm / Air
Z105325MX56	Z105325PM56	25 ppm / Pentane 50% LEL / O2 16% / N2
Z105325MX57	Z105325PM57	25 ppm / Prop.Sim. 50% LEL (1.62% CH4) / CO 50 ppm / O2 19% / N2
Z105325MX58	Z105325PM58	25 ppm / Pentane 25% LEL / CO 100 ppm / O2 19% / N2
Z105325MX59	Z105325PM59	25 ppm / Methane 50% LEL / CO 100 ppm / O2 18% / N2
Z105325MX60	Z105325PM60	25 ppm / Prop.Sim. 50% LEL (1.62% CH4) / CO 50 ppm / Air
Z105325MX64	Z105325PM64	25 ppm / Methane 50% LEL / CO 200 ppm / O2 20.9% / N2
Z105325MX65	Z105325PM65	25 ppm / Methane 30% LEL (1.5%) / CO 95 ppm / O2 18% / N2
Z105325MX66	Z105325PM66	25 ppm / Propane 50% LEL (1.05%) / CO 50 PPM / O2 18% / N2
Z105325MX67	Z105325PM67	25 ppm / Pentane 50% LEL / CO 100 ppm / Air
Z105325MX68	Z105325PM68	25 ppm / Methane 50% LEL (2.5%) / CO 100 PPM / O2 13% / N2
Z105325MX69	Z105325PM69	25 ppm / Methane 50% LEL (2.5%) / CO 50 PPM / O2 17% / N2
Z105325MX77	Z105325PM77	25 ppm / Prop. Sim. 50% LEL (1.62% CH4) / CO 50 ppm / O2 18% / N2
Z105325MX78	Z105325PM78	25 ppm / CH4 50% LEL / CO 100 ppm / O2 19% / N2
Z105325MX81	Z105325PM81	25 ppm / Pentane 25% LEL / CO 200 ppm / O2 19% / N2
Z105325MX82	Z105325PM82	25 ppm / Methane 50% LEL / CO 50 ppm / O2 18% / N2
Z105325MX83	Z105325PM83	25 ppm / n-Pentane 25% LEL / O2 19% / N2

BUMP GAS

11 liter aerosol

A1053BG1	A1053BG1	Bump Gas (H2S / CO / Methane (LEL) / O2)
A1053BG2	A1053BG2	Bump Gas (H2S / CO / Pentane (LEL) / O2)
A1053BG3	A1053BG3	Bump Gas (H2S / CO / Propane (LEL) / O2)

76 liter cylinders

X105325	X105325PN	25 ppm / N2
X105325A	X105325PA	25 ppm / Air
X105350	X105350PN	50 ppm / N2
X105350A	X105350PA	50 ppm / Air
X105325MX50	X105325PM50	25 ppm / Pentane 25% LEL / CO 50 ppm / O2 19% / N2
X105325MX51	X105325PM51	25 ppm / Methane 50% LEL / CO 50 ppm / O2 12% / N2

Other mixtures available upon request

ISOBUTYLENE

17 liter cylinders

P105510	P105510PA	10 ppm / Air
P105525	P105525PA	25 ppm / Air
P105550	P105550PA	50 ppm / Air
P105575	P105575PA	75 ppm / Air
P1055100	P1055100PA	100 ppm / Air
P1055500	P1055500PA	500 ppm / Air
P10551000	P10551000PA	1000 ppm / Air

34 liter cylinders

HP105510	H105510PA	10 ppm / Air
HP105520	H105520PA	20 ppm / Air
HP105550	H105550PA	50 ppm / Air
HP105575	H105575PA	75 ppm / Air
HP1055100	H1055100PA	100 ppm / Air

103 liter cylinders

105510	J105510PA	10 ppm / Air
105520	J105520PA	20 ppm / Air
105525	J105525PA	25 ppm / Air
105550	J105550PA	50 ppm / Air
105575	J105575PA	75 ppm / Air
1055100	J1055100PA	100 ppm / Air

221 liter cylinders

IM1055100	M1055100PA	100 ppm / Air

550 liter cylinders

E1055100	E1055100PA	100 ppm / Air

METHANE (CH4)

17 liter cylinders

P1971	P1971	99%
P197110	P197110PA	10 ppm / Air
P197150	P197150PA	50 ppm / Air
P197175	P197175PA	75ppm / Air
P197195	P197195PA	95 ppm / Air
P1971100	P1971100PA	100 ppm / Air
P1971015VMX	P197115VM1	15% by Volume / CO2 15% by Volume / N2
P1971020VN	P197120VN	20% by volume / N2
P1971050VN	P197150VN	50% by Volume / N2
P1971050VMX	P197150VM2	50% by Volume / CO2 35% by Volume / N2
P1971050	P197110LA	10% LEL (0.5% by Volume) / Air
P19711	P197120LA	20% LEL (1.0% by Volume) / Air
P19712	P197140LA	40% LEL (2.0% by Volume) / Air
P197125	P197150LA	50% LEL (2.5% by Volume) / Air
P19713	P197160LA	60% LEL (3.0% by Volume) / Air
P197110MX2	P197110LM2	10% LEL / CO 35 ppm / O2 18% / N2
P197129MX3	P197129LM3	29% LEL / O2 15% / N2
P197150MX1	P197150LM1	50% LEL / CO 50 ppm / Air
P197150MX16	P197150LM16	50% LEL / CO 200 ppm / O2 20% / N2

34 liter cylinders

HP1971	H1971	99%
HP19711	H197120LA	20% LEL (1.0% by Volume) / Air
HP19710162VMX	H19711.62VM4	Prop. Sim. 50% LEL (1.62% CH4) / CO 50 ppm / Air
HP197125	H197150LA	50% LEL (2.5% by Volume) / Air
HP197150MX	H197150LM42	50% LEL / O2 17% / N2
HP197150MX1	H197150LM1	50% LEL / CO 50 ppm / Air
HP197150MX8	H197150LM8	50% LEL / CO 200 ppm / O2 19.5% / N2
HP197150MX16	H197150LM16	50% LEL / CO 200 ppm / O2 20% / N2

103 liter cylinders

197110	J197110PA	10 ppm / Air
197150	J197150PA	50 ppm / Air
197195	J197195PA	95 ppm / Air
1971100	J1971100PA	100 ppm / Air
1971200	J1971200PA	200 ppm / Air
1971400	J1971400PA	400 ppm / Air
1971500	J1971500PA	500 ppm / Air
1971050	J197110LA	10% LEL (0.5% by Volume) / Air
19711	J197120LA	20% LEL (1.0% by Volume) / Air
1971125	J197125LA	25% LEL (1.25% by Volume) / Air
197115	J197130LA	30% LEL (1.5% by Volume) / Air

METHANE (CH4)

103 liter cylinders

19710162VMX	J19711.62VM4	Prop. Sim. 50% LEL (1.62% CH4) / CO 50 ppm / Air
19710162VMX1	J19711.62VM1	Prop. Sim 50% LEL (1.62% CH4) / CO 50 ppm / O2 18% / N2
19712	J197140LA	40% LEL (2.0% by Volume) / Air
197125	J197150LA	50% LEL (2.5% by Volume) / Air
19713N	J19713VN	3% by Volume / N2
197129MX2	J197129LM2	29% LEL / CO 60 ppm / O2 15% / N2
197129MX3	J197129LM3	29% LEL / O2 15% / N2
197150MX1	J197150LM1	50% LEL / CO 50 ppm / Air
197150MX2	J197150LM2	50% LEL / CO 50 ppm / O2 19% / N2
197150MX3	J197150LM3	50% LEL / CO 50 ppm / O2 17% / N2
197150MX4	J197150LM42	50% LEL / CO 50 ppm / O2 12% / N2
197150MX11	J197150LM11	50% LEL / CO 100 ppm / O2 19% / N2
197150MX32	J197150LM32	50% LEL / CO 250 ppm / O2 17% / N2

221 liter cylinders

M1971100	M1971100PA	100 ppm / Air
IM19711	M197120LA	20% LEL (1.0% by Volume) / Air
IM19712	M197140LA	40% LEL (2.0% by Volume) / Air
IM197125	M197150LA	50% LEL (2.5% by Volume) / Air

550 liter cylinders

E197125	E197150LA	50% LEL (2.5% by Volume) / Air

NITRIC OXIDE (NO)

29 liter cylinders		
F16605	F16605PN	5 ppm / N2
F166010	F166010PN	10 ppm / N2
F166025	F166025PN	25 ppm / N2
F166050	F166050PN	50 ppm / N2
F1660100	F1660100PN	100 ppm / N2
58 liter cylinders		
Z16605	Z16605PN	5 ppm / N2
Z166010	Z166010PN	10 ppm / N2
Z166025	Z166025PN	25 ppm / N2
Z166030	Z166030PN	30 ppm / N2
Z166050	Z166050PN	50 ppm / N2
Z166080	Z166080PN	80 ppm / N2
Z1660100	Z1660100PN	100 ppm / N2
Z1660800	Z1660800PN	800 ppm / N2
76 liter cylinder		
XD166010	XD166010PN	10 ppm / N2
XD166025	XD166025PN	25 ppm / N2
XD166050	XD166050PN	50 ppm / N2

NITROGEN (N2)

17 liter cylinders		
P1066	P1066	99.999%
34 liter cylinders		
HP1066	H1066	99.999%
103 liter cylinders		
1066	J1066	99.999%
221 liter cylinders		
IM1066	M1066	99.999%
550 liter cylinder		
E1066	E1066	99.999%

NITROGEN DIOXIDE (NO2)

29 liter cylinders		
F10675A	F10675PA	5 ppm / Air
F10675	F10675PN	5 ppm / N2
F106710A	F106710PA	10 ppm / Air
F106710	F106710PN	10 ppm / N2
F106725A	F106725PA	25 ppm / Air
F106725	F106725PN	25 ppm / N2
58 liter cylinders		
Z10675A	Z10675PA	5 ppm / Air
Z10675	Z10675PN	5 ppm / N2
Z106710A	Z106710PA	10 ppm / Air
Z106710	Z106710PN	10 ppm / N2
Z106725A	Z106725PA	25 ppm / Air
Z106725	Z106725PN	25 ppm / N2
Z106730A	Z106730PA	30 ppm / Air
Z106730	Z106730PN	30 ppm / N2
Z106750A	Z106750PA	50 ppm / Air
Z106750	Z106750PN	50 ppm / N2
76 liter cylinders		
XD10675A	XD10675PA	5 ppm / Air
XD10675	XD10675PN	5 ppm / N2
XD106710A	XD106710PA	10 ppm / Air
XD106710	XD106710PN	10 ppm / N2

Contact Customer Service for other mixture information

NITROUS OXIDE (N2O)

17 liter cylinders		
P107010	P107010PA	10 ppm / Air
P107025	P107025PA	25 ppm / Air
P1070500	P1070500PA	500 ppm / Air
34 liter cylinders		
HP107010	H107010PA	10 ppm / Air
HP107025	H107025PA	25 ppm / Air
HP1070500	H1070500PA	500 ppm / Air
103 liter cylinders		
107010	J107010PA	10 ppm / Air
107025	J107025PA	25 ppm / Air
1070500	J1070500PA	500 ppm / Air
550 liter cylinders		
E107010	E107010PA	10 ppm / Air
E107025	E107025PA	25 ppm / Air
E1070500	E1070500PA	500 ppm / Air

OXYGEN (O2)

17 liter cylinders		
P107204	P1072.4VN	0.4% / N2
P10722	P10722VN	2.0% / N2
P10724	P10724VN	4.0% / N2
P10725	P10725VN	5.0% / N2
P10728	P10728VN	8.0% / N2
P107217	P107217VN	17.0% / N2
P107218	P107218VN	18.0% / N2
P1072209	P107220.9VN	20.9% / N2
34 liter cylinders		
HP107204	H1072.4VN	0.4% / N2
HP10722	H10722VN	2.0% / N2
HP10724	H10724VN	4.0% / N2
HP10725	H10725VN	5.0% / N2
HP10728	H10728VN	8.0% / N2
HP107217	H107217VN	17.0% / N2
HP107218	H107218VN	18.0% / N2
HP1072209	H107220.9VN	20.9% / N2
103 liter cylinders		
107202	J1072.2VN	0.2% / N2
107204	J1072.4VN	0.4% / N2
107205	J1072.5VN	0.5% / N2
10722	J10722VN	2.0% / N2
10724	J10724VN	4.0% / N2
10725	J10725VN	5.0% / N2
10728	J10728VN	8.0% / N2
107210	J107210VN	10.0% / N2
107217	J107217VN	17.0% / N2
107218	J107218VN	18.0% / N2
1072209	J107220.9VN	20.9% / N2
107221	J107221VN	21.0% / N2
221 liter cylinders		
IM10722	M10722VN	2% / N2
IM10724	M10724VN	4% / N2
550 liter cylinders		
E107204	E1072.4VN	0.4% / N2
E10722	E10722VN	2% / N2

PENTANE

17 liter cylinders		
P126550	P126550LA	50% LEL / Air
P126550MX2	P126550LM2	50% LEL / O2 15% / N2
34 liter cylinders		
HP126510	H126510LA	10% LEL / Air
HP126525	H126525LA	25% LEL / Air
HP126525MX4	H126525LM4	25% LEL / CO 100 ppm / O2 19% / N2
HP126525MX7	H126525LM7	25% LEL / O2 19% / N2
HP126550MX2	H126550LM2	50% LEL / O2 15% / N2
103 liter cylinders		
126525	J126525LA	25% LEL / Air
126525MX4	J126525LM4	25% LEL / CO 100 ppm / O2 19% / N2
126550	J126550LA	50% LEL / Air
126550MX2	J126550LM2	50% LEL / O2 15% / N2
550 liter cylinders		
E126525MX	E126525LM5	25% LEL / CO 50 ppm / O2 19% / N2

PHOSPHINE (PH3)

58 liter cylinders		
Z219905	Z2199.5PN	0.5 ppm / N2
Z21991	Z21991PN	1 ppm / N2
Z21995	Z21995PN	5 ppm / N2
76 liter cylinders		
X219905	X2199.5PN	0.5 ppm / N2
X21991	X21991PN	1 ppm / N2
X21995	X21995PN	5 ppm / N2

PROPANE

17 liter cylinders		
P1075	P1978	99%
P107530	P197830LA	30% LEL / Air (0.63% by Volume)
P107550	P197850LA	50% LEL / Air (1.05% by Volume)
34 liter cylinders		
HP107520	H197820LA	20% LEL / Air (0.42% by Volume)
HP107525	H197825LA	25% LEL / Air (0.525% by Volume)
HP107530	H197830LA	30% LEL / Air (0.63% by Volume)
HP107550	H197850LA	50% LEL / Air (1.05% by Volume)
103 liter cylinders		
107520	J197820LA	20% LEL / Air (0.42% by Volume)
107525	J197825LA	25% LEL / Air (0.525% by Volume)
107530	J197830LA	30% LEL / Air (0.63% by Volume)
107530MX	J197830LM1	30% LEL / CO 60 ppm / O2 15% / N2
107550	J197850LA	50% LEL / Air (1.05% by Volume)

SULFUR DIOXIDE (SO2)

29 liter cylinders		
F107910	F107910PN	10 ppm / N2
F107910A	F107910PA	10 ppm / Air
F107925	F107925PN	25 ppm / N2
F107925A	F107925PA	25 ppm / Air
F107950	F107950PN	50 ppm / N2
58 liter cylinders		
Z10795	Z10795PN	5 ppm / N2
Z10795A	Z10795PA	5 ppm / Air
Z10795MX	Z10795PM4	5 ppm / Pentane 25% LEL / CO 50 ppm / O2 15% / N2
Z107910	Z107910PN	10 ppm / N2
Z107910A	Z107910PA	10 ppm / Air
Z107910MX	Z107910PM8	10 ppm / Propane 52% LEL / CO 50 ppm / Air
Z107920	Z107920PN	20 ppm / N2
Z107925A	Z107925PA	25 ppm / Air
Z107925	Z107925PN	25 ppm / N2
Z107925MX	Z107925PM6	25 ppm / Pentane 25% LEL / CO 50 ppm / O2 19% / N2
Z107925MX1	Z107925PM1	25 ppm / Pentane 50% LEL / CO 200 ppm / O2 20 / N2
Z107935	Z107935PN	35 ppm / N2
Z107950	Z107950PN	50 ppm / N2
76 liter cylinders		
X10795	X10795PN	5 ppm / N2
X10795A	X10795PA	5 ppm / Air
X107910	X107910PN	10 ppm / N2

TOLUENE

58 liter cylinders		
Z1294100	Z1294100PA	100 ppm / Air
Z1294400	Z1294400PA	400 ppm / Air

ACCESSORIES

REGULATORS FOR 17 / 34 LITER STEEL CYLINDERS

		CGA 600
400	N/A	Dispensing Valve W/Tubing
400-150	N/A	Regulator 1.5 LPM (17 / 34 liter)
400-025	N/A	Regulator 0.25 LPM (17 / 34 liter)
400-030	N/A	Regulator 0.3 LPM (17 / 34 liter)
400-050	N/A	Regulator 0.5 LPM (17 / 34 liter)
400-100	N/A	Regulator 1.0 LPM (17 / 34 liter)

REGULATORS FOR 29 / 58 LITER ALUM. and 103 LITER STEEL CYL

		CGA C-10
500-150	N/A	Regulator 1.5 LPM (58 / 103 liter)
500-250	N/A	Regulator 2.5 LPM (58 / 103 liter)
500-025	N/A	Regulator 0.25 LPM (58 / 103 liter)
500-020	N/A	Regulator 0.2 LPM (58 / 103 liter)
500-600	N/A	Regulator 6.0 LPM (58 / 103 liter)
500-030	N/A	Regulator 0.3 LPM (58/103 liter)
500-050	N/A	Regulator 0.5 LPM (58 / 103 liter)
500-050-SS	N/A	SS Regulator 0.5 LPM (58 liter)
500-100	N/A	Regulator 1.0 LPM (58 / 103 liter)
500-100-SS	N/A	SS Regulator 1.0 LPM (58 liter)
Gauge	N/A	1000 PSI gauge for 500 series regulator
GaugeSS	N/A	1000 PSI S.S. gauge for 500 series regulator

REGULATORS w/MULTIPLE FLOW SETTINGS

		OF: 0.3 - 0.5 - 1 - 1.5 - 2 - 2.5 - 3 - 5 - 6 -7 - 8 liters per minute **For 17 / 34 / 103 / 29 / 58 / 76 LITER CYLINDERS & REFILLABLES**
600-165	N/A	Regulator with CGA 165 inlet (221 liter cylinders)
600-170	N/A	Regulator with CGA 170 inlet
600-330	N/A	Regulator with CGA 330 inlet (Refillable cylinder)
600-350	N/A	Regulator with CGA 350 inlet (Refillable cylinder)
600-580	N/A	Regulator with CGA 580 inlet (Refillable cylinder)
600-590	N/A	Regulator with CGA 590 inlet (Refillable cylinder)
600-600	N/A	Regulator with CGA 600 (17/ 34 liter steel cylinders)
600-660	N/A	Regulator with CGA 660 (Refillable cylinder)
600-C10	N/A	Regulator for 103 liter cylinders (Non-Reactive Mixtures-Brass Gauge)
600-C10-SS	N/A	Regulator for 29 / 58 liter aluminum cylinder (Reactive Mixtures-SS Gauge)

MINIATURE REGULATORS

For 221 liter cylinders

701	N/A	Regulator with 25 PSIG delivery pressure and CGA 165 inlet

MINIATURE REGULATORS

For 76 liter, 550 liter cylinders

900-30	N/A	Regulator w/3500 psig inlet pressure, 0-30 psig delievery range (various cga connections)

DEMAND FLOW REGULATORS

For 17 / 34 / 103 / 29 / 58 / 76 LITER CYLINDERS & REFILLABLES

8C10	N/A	Demand Flow Regulator for 103 / 29 / 58 liter cylinders
8180	N/A	Demand Flow Regulator with CGA 180
8330	N/A	Demand Flow Regulator with CGA 330
8350	N/A	Demand Flow Regulator with CGA 350
8580	N/A	Demand Flow Regulator with CGA 580
8590	N/A	Demand Flow Regulator with CGA 590
8600	N/A	Demand Flow Regulator with CGA 600
8660	N/A	Demand Flow Regulator with CGA 660

EMPTY CASES

500A	N/A	Case to Hold 4 ea-17 / 29 / 34 Ltr. Cyl
500B	N/A	Case for 1 ea 58 / 103 Ltr. & 2 ea 17 / 29 / 34 Ltr. Cyl.
500C	N/A	Case to Hold 3 ea 58/103 Ltr. Cyl
500D	N/A	Case to Hold 2 ea 17 / 29 / 34 Ltr. Cyl
505	N/A	Case to Hold 2 ea 58/103 Ltr. Cyl

CYLINDER TRANSPORT BAG

CTB-100	N/A	Dual cylinder Transport Bag

SUPPLEMENTAL ACCESSORIES

TY2002	N/A	Tygon Tubing (Per ft.)
FEP-2	N/A	1/8" diameter tubing (for chlorine)
FEP-4	N/A	1/4" diameter tubing (for chlorine)
909D	N/A	DeLuxe Tedlar Span Bag 9x9 Double Valve

Specialty Gases & Equipment

MESA

Specialty Gases & Equipment

Quality...

It is the guiding principle of MESA Specialty Gas and equipment to offer only the highest quality calibration gas products to our customers.

Service...

We recognize that only excellent customer service will allow our growth in this highly competitive calibration gas industry.

Support...

MESA Specialty Gas offers technical support through top experts in the field. Let us know how we can assist you.

MESA 300 Series

20L Regulator

Recommended Applications

The 300 Series regulator is for use with MESA's 20L Cylinder. These regulators are recommended for non-corrosive gas service.

Description

The 300 Series regulator is a single stage diaphragm style regulator. The pressure control knob permits adjustment of the outlet delivery pressure. Each regulator comes with a delivery pressure gauge.

Available Models

Part Number	Output Range
300-030	0-30 psig

Standard Materials

Body	Brass

Diaphragm	Viton
Seat	Acetal
Seal	Viton

Standard Specifications

Maximum Inlet	**300 psig**
Flow Coefficient	**Cv= 0.36**
Temperature Range	**35º to 150º F**
Inlet Connection	**CGA 165**
Outlet Connection	**¼" FNPT**
Gauge	**0-30 psig**

Specialty Gases & Equipment

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MESA 400 Series

17L Preset Flow Regulator

Recommended Applications

The 400 Series regulator is for use with MESA's 17L Cylinder. These regulators are recommended for non-corrosive gas service.

Description

The 400 Series regulator is a single stage piston style regulator. The control valve permits constant gas flow and easy on/off. Each regulator comes with a cylinder pressure gauge and is available in five preset flow models.

Available Models

Part Number	Flow Rate
400-025	0.25
400-030	0.30
400-050	0.50
400-100	1.00

400-150	1.50

Standard Materials

Body	**Brass Bar Stock**
Spring Housing	**Chrome Plated**
Cap	**Brass**
Piston	Brass
Piston "O" Rings	Buna-N
Seal	Teflon

Standard Specifications

Maximum Inlet	**500 psig**
Temperature Range	**0º to 140º F**
Inlet Connection	**CGA 600**
Outlet Connection	**3/16" Hose Barb**

Specialty Gases & Equipment

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High Performance Specialty Gas Regulators

MESA Series 200 Dual Stage Cylinder Regulator

Standard Configuration

All regulators are sold complete with inlet CGA, two gauges and a diaphragm packless outlet control valve.

Recommended Applications

The two stage cylinder regulator is recommended where delivery pressure must be maintained constant as the cylinder pressure decreases. These regulators are ideally suited for continuous withdrawal of gas from pressurized cylinders.

Brass bodies are recommended for non-corrosive gases. Chrome plated brass bodies are also recommended for non-corrosive gases. The addition of chrome plating to the brass body helps to protect the outside body of the regulator from corrosive

Description

The MESA 200 Series regulators are precision manufactured from machined bar stock. This design minimizes contamination of the gas stream by in-board diffusion of atmospheric contaminates. The design also minimizes cross-contamination of the gas stream as is frequently encountered with less expensive forged body regulators.

Standard Materials of Construction

Body Options:
- Brass
- Chrome Plated Brass
- 316L Stainless Steel

Diaphragm:
- Teflon Lined 304 Stainless Steel

Seat:
- Tefzel

Seals:
- Teflon

Poppet:
- 316L Stainless Steel

Poppet Spring:
- Inconel 600

ambient conditions such as found in chemical plants and refineries. 316L Stainless Steel bodies are recommended for mildly corrosive gases. Monel and Hastelloy bodies are available upon special request.	Inlet Filter: 20 Micron 316 Stainless Steel Adjusting Knob: Black Anodized Aluminum
Available CGA: 110, 170, 180, 320, 326, 330, 346, 350, 510, 540, 580, 590, 660, 679 and 705	

Specialty Gases & Equipment

MESA Specialty Gases & Equipment

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Support...

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High Performance Specialty Gas Regulators

MESA Series 100 Single Stage Cylinder Regulator

Standard Configuration

All regulators with the exception of the low inlet pressure series (see below) are sold complete with inlet CGA, two gauges and a diaphragm packless outlet control valve.

Recommended Applications

The single stage cylinder regulator is recommended where slight changes in delivery pressure are acceptable as the cylinder pressure decreases. These regulators are ideally suited for periodic withdrawal of gas from pressurized cylinders.

Brass bodies are recommended for non-corrosive gases. Chrome plated brass bodies are also recommended for non-corrosive gases. The addition of chrome plating to the brass body helps to protect the outside body of the regulator from corrosive ambient conditions such as found in chemical plants and refineries. 316L Stainless Steel bodies are

Description

The MESA 100 Series regulators are precision manufactured from machined bar stock. This design minimizes contamination of the gas stream by in-board diffusion of atmospheric contaminates. The design also minimizes cross-contamination of the gas stream as is frequently encountered with less expensive forged body regulators.

Standard Materials of Construction

Body Options:
- Brass
- Chrome Plated Brass
- 316L Stainless Steel

Diaphragm:
- Teflon Lined 304 Stainless Steel

Seat:
- Tefzel

Seals:
- Teflon

Poppet:
- 316L Stainless Steel

Poppet Spring:

recommended for mildly corrosive gases. Monel and Hastelloy bodies are available upon special request.	Inconel 600 Inlet Filter: 20 Micron 316 Stainless Steel Adjusting Knob: Black Anodized Aluminum

Special Configuration for Low Inlet Pressure Applications

A specially designed regulator is available for low inlet pressure applications such as encountered when sampling hydrocarbon mixes in low pressure cylinders. The regulator has a special seat designed to insure precise control of the delivery pressure at low inlet pressures. The regulator is sold complete with inlet CGA and two gauges. The standard diaphragm packless valve is replaced by a packed outlet control valve.

Available CGA: 110, 170, 180, 320, 326, 330, 346, 350, 510, 540, 580, 590, 660, 679 and 705

Specialty Gases & Equipment

MESA

Specialty Gases & Equipment

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Support...

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MESA 500 Series

58L/103L Preset Flow Regulator

Recommended Applications

The 500 Series regulator is for use with MESA's 58L and 103L Cylinders. These regulators are recommended for non-corrosive gas service. However, they have also been found acceptable for low level reactive gases provided the minor reactive component is less than 100 ppm in concentration and the regulator is removed from the cylinder after each use. MESA's 600 Series aluminum body regulator is recommended for extended use with reactive calibration gas standards. These regulators are recommended for non-corrosive gas service.

Description

The 500 Series regulator is a single stage piston style regulator. The control valve permits constant gas flow and easy on/off. Each regulator comes with a cylinder pressure gauge and is available in five preset flow models.

Recommended Applications

The 400 Series regulator is for use with MESA's 17L Cylinder. These regulators are recommended for non-corrosive gas service.

Available Models

Part Number	Flow Rate
500-020	0.20
500-025	0.25
500-030	0.30
500-050	0.50
500-100	1.00
500-150	1.50
500-250	2.50
500-600	6.00

Standard Materials

Body	**Brass Bar Stock**
Spring Housing	**Chrome Plated**
Cap	**Brass**
Piston	Brass
Piston "O" Rings	Buna-N
Seal	Teflon

Standard Specifications

Maximum Inlet	**1,000 psig**
Temperature Range	**0º to 140º F**
Inlet Connection	**5/8-18 UNF (C-10)**
Outlet Connection	**3/16" Hose Barb**

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Service...

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Support...

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MESA 600 Series

58/103L Multi-Flow Regulator

Recommended Applications

The 600 Series regulator is for use with MESA's 58L, 103L and 104L Cylinders. They can also be used on conventional high pressure cylinders and lecture bottles. These regulators are recommended for both non-corrosive and corrosive gas service including Ammonia, Hydrogen Sulfide, Nitric Oxide and Sulfur Dioxide standards.

Description

The 600 Series regulator is a single stage piston style regulator. All wetted parts of the regulator are either aluminum or stainless steel. The regulator has 8 switch selectable flow settings ranging from 0.2 to 6 liters per minute. It is available with either a brass or stainless steel gauge and various CGA connections.

Available Models

Part Number	Gauge (psig)	Inlet
610-CGA	0-3,000	Brass CGA

620-CGA	0-3,000 SS	SS CGA
610-CGA-BRC10	0-1,000 Brass	Brass C-10
620-SSC10	0-1,000 SS	SS C-10

NOTE: C-10 is same as 5/8"- 18UNF

Standard Materials

Body	**Aluminum**
Spring Housing	**Aluminum**
Cap	**Aluminum**
Nozzle	**Aluminum**
Seal	Viton
Seat	Kel-F 50 Micron
Inlet Filter	Stainless Steel

Standard Specifications

Maximum Inlet	**2,000 psig**
Temperature Range	**0º to 140º F**
Flow Settings	**0.2, 0.3, 0.5, 1.0, 1.5, 2.5, 5.0, 6.0**
Outlet Connection	**3/16" Hose Barb**

MESA Specialty Gases & Equipment

Quality...

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Service...

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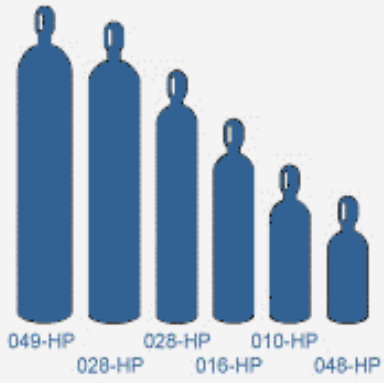
Support...

MESA Specialty Gas offers technical support through top experts in the field. Let us know how we can assist you.

Gas Cylinder Specifications

MESA Specialty Gases offers a wide variety of specialty gas and calibration gas cylinders. Take a look at our most common specialty gas cylinder packages available below. If you are interested in disposable calibration gas, take a look at our disposable calibration gas web site for product details. We also offer a stock of BTU specialty gas mixtures, Natural gas standards and RGA mixtures available for immediate delivery. Take a look at our RGA and BTU standards page for details.



High Pressure Steel to 2640 psi

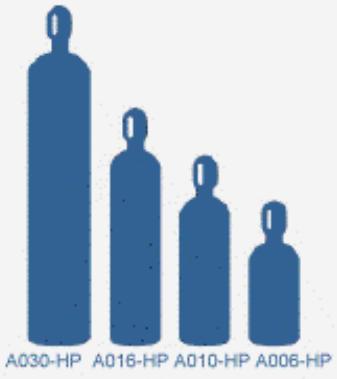
Cylinder Designation	Water Capacity (liters)	Diameter (inches)	Height w/ Valve (inches)	Nominal Shipping Weight(lbs)*
049-HP	49-50	9.25	60	150
044-HP	43-44	9.00	56	125
028-HP	27-28	7.00	47	70
016-HP	16-17	7.00	36	53
010-HP	10-11	7.00	28	38
008-HP	7-8	7.00	23	31

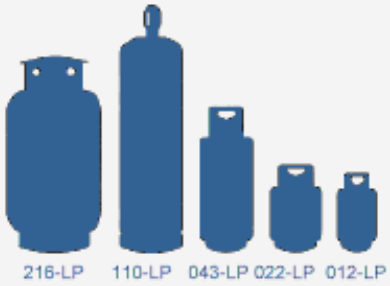
*includes estimated weight of contents

High Pressure Aluminum to 2200 psi

Cylinder Designation	Water Capacity (liters)	Diameter (inches)	Height w/ Valve (inches)	Nominal Shipping Weight(lbs)*
A030-HP	29-30	8.00	53	65
A016-HP	15-16	7.25	38	45
A010-HP	10-11	7.25	29	32
A006-HP	5-6	7.00	21	22

*includes estimated weight of contents





Low Pressure Steel and Aluminum 240 psi

Cylinder Designation	Water Capacity (liters)	Diameter (inches)	Height w/ Valve (inches)	Nominal Shipping Weight(lbs)*
Low Pressure Steel Cylinders				
216-LP	216-217	24.00	40	175
110-LP	108-110	15.00	50	75
065-LP	64-65	12.00	43	46
046-LP	43-44	12.00	29	30
028-LP	27-28	9.00	35	28
022-LP	21-22	12.00	18	20
012-LP	11-12	9.00	17	15
Low Pressure Aluminum Cylinders				
A022-LP	21-22	12.00	18	13
A012-LP	11-12	9.00	17	10

*includes estimated weight of contents

Disposable and Transportable

Cylinder Designation	Material	Outlet Fitting	Service Pressure (psi)	Gas Contents (liters)	Diameter (inches)	Height (inches)
14L	Steel	CGA-160*	240	14	3	10
17L	Steel	CGA-600	240	17	3	11

GAS Regulators: Pressure/Flow

GasCon Systems

Cylinder Pressure Regulators

(Australian Standard)

Brass-Body

"GC" Grade

Single-Stage — **401 High Purity**

Dual-Stage — **411 High Purity**

also available — **SS-Body : Corrosive Gases**

CGA(-180,N2) Bottle Thread

Restek Regulators & accessories

Siltek-treated — **gas standards regulators**

MINIreg (Scott bottle)

Backpressure Reg

MiniCYL Reg

VICI Regulator/Controllers

Needle/ShutOff Valve

Mass Flow Controllers

Combo Pressure Reg

microMetering Valve

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GAS Regulators: Pressure/Flow

GasCon Systems

Cylinder Pressure Regulators

(Australian Standard)

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MiniCYL Reg

VICI Regulator/Controllers

Needle/ShutOff Valve

Mass Flow Controllers

Combo Pressure Reg

microMetering Valve

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GasCon Systems

(Australian Standard)

Cylinder Pressure Regulators

(Australian Standard)

Brass–Body

401 High Purity

Single–Stage

411 High Purity

Dual–Stage

also available **SS–Body : Corrosive Gases**
CGA(–180,N2) Bottle Thread

see also Restek CGA Regulators & Accessories

Gascon Systems Single Stage Regulators

The Gascon Systems range of single stage regulators are manufactured from brass bar stock and are recommended for use in non-corrosive gas applications. Versions are available for industrial, laboratory, medical and scientific grade gases.

Wide range of options including; inlet connection orientations, inlet fittings (eg. AS, CGA, BS, DIN, AFNOR), diaphragm materials, outlet pressure ranges, ventable pressure relief valves, internal flow restrictors for pressure charging systems, preset outlet pressure models, different seat configurations for different flow/pressure characteristics, wall mount brackets and panel mount kits.

- Encapsulated seat assembly with built-in filter
- Bar Stock body
- Maximum outlet pressure adjusting stop
- Colour coded control knobs
- Australian made

Applications:

- For use in non-corrosive gas applications
- Where a slight variation in delivery pressure is acceptable as cylinder contents pressure decreases
- Regulator is used for intermediate short periods of time
- Used with liquefied gas supplies
- Laboratory reticulation system supply regulator.

Specifications:

Max. Inlet Pressure: 20,000 kPa @ 15°C (31,500 kPa optional)

Outlet Pressures: 0 – 20,000 kPa

Gauges: 50mm diameter brass

Body Ports: ¼" NPT (F)

Weight: 1.4 kg

Materials:

Body: Chrome plated brass bar stock

Bonnet: Chrome plated brass

Seat: PCTFE or PTFE

Filter: 63 micron cupro nickel

Diaphragm: Neoprene; EDPM; PTFE coated neoprene; or 316L stainless steel

ORDERING INFORMATION XX - X - X - X - XXXX - XXX - XXX - XXX - XX - XXXX

Model	Ports	Inlet	Pressure Adjustment	Outlet Pressure	Optional Fittings	Inlet Fitting	Outlet Fitting	Options	Gas
R Standard (up to grade 3.5) **PR** Laboratory (up to grade 4.5) **HR** High Purity (up to grade 5.5) **MR** Medical	**2** **3** **4** **5** **6**	**V** Vertical **S** Side **R** Rear	**A** Adjustable **P** Preset	Required Outlet Pressure in kPa	**G** Inlet Gauge **GG** Inlet & Outlet Gauge **P** Pressure Relief Valve **GGP** 2 Gauges & PRV	**T10** (AS2473 Type 10) **T11** (AS2473 Type 11) **T20** (AS2473 Type 20) **T30** (AS2473 Type 30) **T50** (AS2473 Type 50) **T51** (AS2473 Type 51) **T60** (AS2473 Type 60) **T61** (AS2473 Type 61) **320** (CGA320) **330** (CGA330) **350** (CGA350) **510** (CGA510) **540** (CGA540) **580** (CGA580) **Y** (Medical Yoke) **4F** (1/4" Female NPT) **Others by Description**	**4F** (1/4" Female Port) **2S** (1/8" Tube Fitting) **4S** (1/4" Tube Fitting) **6S** (3/8" Tube Fitting) **8S** (1/2" Tube Fitting) **2M** (1/8"NPT male) **4M** (1/4" NPT male) **6M** (3/8" NPT male) **8M** (1/2" NPT male) **2B** (1/8" hose barb) **4B** (1/4" hose barb) **8B** (1/2" hose barb) **FA** (fine adjust valve) **58R** (5/8"-18UN RH) **58L** (5/8"-18UN LH) **SIS** (medical sleeve indexed system) **Others by Description**	**WM** Wall Mount Bracket **PM** Panel Mount Bracket	**ACET** Acetylene **AIR** Air **AR** Argon **CO** Carbon Monoxide **CO2** Carbon Dioxide **HE** Helium **H2** Hydrogen **LPG** Propane **METH** Methane **N2** Nitrogen **N2O** Nitrous Oxide **OXY** Oxygen **SF6** Sulfur Hexafluorid **OTHERS by Symbol**

Ordering examples

HR-5-V-A-1000-GGP-T20-4S-H2 Scientific hydrogen single stage regulator, vertical Type 20 inlet, adjustable to 1000 kPa, inlet and outlet gauges, pressure relief valve and ¼" brass tube outlet fitting

MR-4-S-P-400-GP-Y-SIS-AIR Medical air single stage regulator, side pin indexed yoke inlet, preset 400 kPa, inlet gauge, pressure relief valve and a sleeved indexed outlet fitting

GC Systems Dual Stage Regulators

The GC Systems range of dual stage regulators are manufactured from brass bar stock and are recommended for use in non-corrosive gas applications. Versions are available for industrial, laboratory, medical and scientific grade gases.

Wide range of options including; inlet connection orientations, inlet fittings (eg. AS, CGA, BS, DIN, AFNOR), diaphragm materials, outlet pressure ranges, ventable pressure relief valves, preset outlet pressure models, different seat configurations for different flow/pressure characteristics, and panel mount kits.

- Encapsulated seat assembly with built-in filter
- Bar Stock body
- Maximum outlet pressure adjusting stop
- Australian made

Applications:

- For use in non-corrosive gas applications
- Where a constant delivery pressure is required as cylinder contents pressure decreases
- Regulator is used for continuous long periods of time
- Laboratory reticulation system supply regulator

Specifications:

Max. Inlet Pressure: 20,000 kPa @ 15°C (31,500 kPa optional)

Outlet Pressures: 0 – 5,000 kPa

Gauges: 50mm diameter brass

Body Ports: ¼" NPT (F)

Weight: 2.1 kg

Materials:

Body: Chrome plated brass bar stock

Bonnet: Chrome plated brass

Seat: PCTFE or PTFE

Filter: 63 micron cupro nickel

Diaphragm: Neoprene; EDPM; PTFE coated neoprene; or 316L stainless steel

ORDERING INFORMATION XX - X - X - X - XXXX - XXX - XXX - XXX -XXX - XXXX

Model	Ports	Inlet	Pressure Adjustment	Outlet Pressure	Optional Fittings	Inlet Fitting	Outlet Fitting	Options	Gas
D Standard (up to grade 3.5) **PD** Laboratory (up to grade 4.5) **HD** High Purity (up to grade 5.5) **MD** Medical	**2** **3** **4** **5** **6**	**V** Vertical **S** Side	**A** Adjustable **P** Preset	Required Outlet Pressure in kPa	**G** Inlet Gauge **GG** Inlet & Outlet Gauge **P** Pressure Relief Valve **GGP** 2 Gauges & PRV **GGPP** 2 Gauges & 2 PRV's	**T10** (AS2473 Type 10) **T11** (AS2473 Type 11) **T20** (AS2473 Type 20) **T30** (AS2473 Type 30) **T50** (AS2473 Type 50) **T51** (AS2473 Type 51) **T60** (AS2473 Type 60) **T61** (AS2473 Type 61) **320** (CGA320) **330** (CGA330) **350** (CGA350) **510** (CGA510) **540** (CGA540) **580** (CGA580) **Y** (Medical Yoke) **4F** (1/4" Female NPT) **Others by Description**	**4F** (1/4" Female Port) **2S** (1/8" Tube Fitting) **4S** (1/4" Tube Fitting) **6S** (3/8" Tube Fitting) **8S** (1/2" Tube Fitting) **2M** (1/8"NPT male) **4M** (1/4" NPT male) **6M** (3/8" NPT male) **8M** (1/2" NPT male) **2B** (1/8" hose barb) **4B** (1/4" hose barb) **8B** (1/2" hose barb) **FA** (fine adjust valve) **58R** (5/8"-18UN RH) **58L** (5/8"-18UN LH) **SIS** (medical sleeve indexed system) **Others by Description**	**PM** Panel Mount Bracket	**ACET** Acetylene **AIR** Air **AR** Argon **CO** Carbon Monoxide **CO2** Carbon Dioxide **HE** Helium **H2** Hydrogen **LPG** Propane **METH** Methane **N2** Nitrogen **N2O** Nitrous Oxide **OXY** Oxygen **SF6** Sulfur Hexafluorid **OTHERS by Symbol**

Ordering examples

HD-5-V-A-700-GGP-T10-4ST-OXY Scientific oxygen dual stage regulator, vertical Type 10 inlet, adjustable to 700 kPa, inlet and outlet gauges, pressure relief valve and ¼" stainless steel tube outlet fitting

PD-5-S-A-100-GP-Y-4B-CO2 Medical carbon dioxide dual stage regulator, side pin indexed yoke inlet, adjustable to 100 kPa, inlet And outlet gauges, pressure relief valve and a ¼" hose barb outlet

401 Series Single Stage Brass Bodied Scientific Regulator

- Pressure ranges of 0-15 to 0-500 PSI are available to cater for a broad range of applications
- Brass barstock body means a smoother surface finish
- Versatility of configuring the regulator with either front or rear panel mounting
- Metal-to-metal diaphragm seal prevents gas contamination
- Capsule seat design for greater serviceability and life
- 316L stainless steel diaphragm
- Leak test certificate

The 401 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases, or where minor fluctuations in outlet pressure (as gas supply diminishes) can be tolerated.

Specifications:

Max. Inlet Pressure: 3000 PSI (210 BAR)
4500 PSI (310 BAR) Option

Gauges: 2" diameter brass, (chrome plated)

Temperature Range: -40º C to 60º C

Body Ports: ¼" FPT

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

Cv: 0.1

Weight: 1.8 kg

Materials:

Body: Brass bar stock

Bonnet: Chrome plated brass

Seat: PTFE
PCTFE with 4500 PSI inlet option

Filter: 10 micron sintered bronze

Diaphragm: 316L stainless steel

Internal Seals: PTFE

ORDERING INFORMATION

S401 - XXX - XXX - XXX - XX

Series	Outlet Pressure	Inlet Fitting	Outlet Fitting	Options
401	**15** (0-15 psi)	**T10** (AS2473 Type 10)	**4F** (1/4" NPT Female)	Inlet Purge
	50 (0-50 psi)	**T20** (AS2473 Type 20)	**2S** (1/8" Tube)	Captured Bonnet Vent
	100 (0-100 psi)	**T30** (AS2473 Type 30)	**4S** (1/4" Tube)	Panel Mount Kit
	150 (0-150 psi)	**T50** (AS2473 Type 50)	**8S** (1/2" Tube)	Wall Mount Bracket
	250 (0-250 psi)	**T60** (AS2473 Type 60)	**2B** (1/8" Hose Barb)	
	500 (0-500 psi)	**350** (CGA350)	**4B** (1/4" Hose Barb)	
		540 (CGA540)	**FA** (Fine adjust valve)	
		580 (CGA580)	**4M** (1/4" NPT Male)	
		4F		
		Others by description	**Others by description**	

401 Series Regulator

Single Stage

Brass Barstock Body

Six-Port Configuration

316L Stainless Steel Diaphragm

401-1331 shown

The 401 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.

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*

Advanced Features

- *Brass 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

400 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 barstock

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

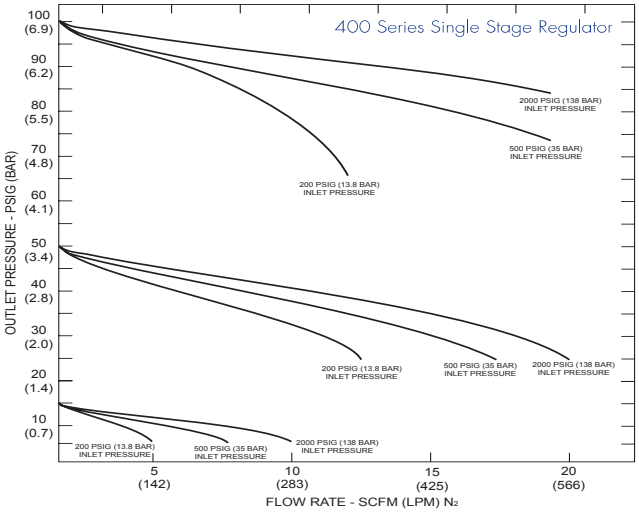
Helium Leak Integrity
1 x 10^{-9} scc/sec

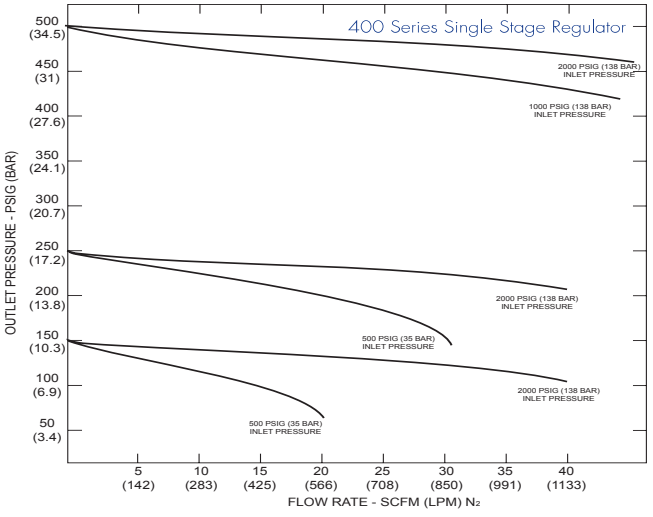
Cv
0.1

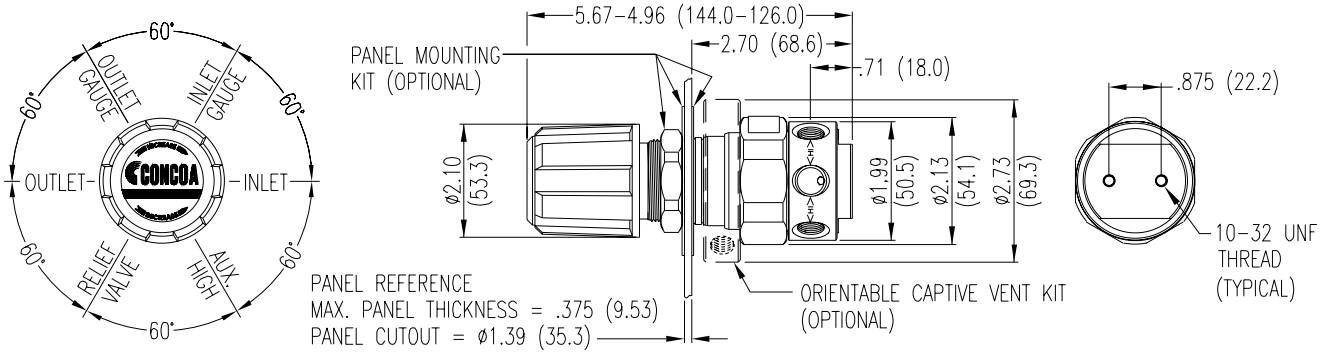
Weight (401-1331-580)
3.99 lbs. (1.81 kg)

CRN OH 5216.5C

Flow Performance Curves







Ordering Information *(For information about how to use this table please see page 4.)*

401	A	B	C	D	-Inlet	Options
Series 401	**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* ***Standard assembly does not include relief valve*	**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: 1/8" Tube Fitting 7: 1/8" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting 9: Diaphragm Valve ¼" FPT A: 1/8" 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: 1/8" Tube TF4: ¼" Tube TF6: 1/8" Tube M06: 6mm Tube	**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 **Not available with 4500 PSIG max inlet pressure*

Related Op

- Panel Mount Kit (550-0002)
- Captured Vent Kit (550-0001)

411 Series Dual Stage Brass Bodied Scientific Regulator

The 411 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases for applications requiring constant pressure control and delivery regardless of supply pressure variations.

- Pressure ranges of 0-15 to 0-400 PSI are available to cater for a broad range of applications
- Brass barstock body means a smoother surface finish
- Front panel mountable that is easily installed
- Metal-to-metal diaphragm seal prevents gas contamination
- Capsule seat design for greater serviceability and life
- 316L stainless steel diaphragm
- Leak test certificate

Specifications:

Max. Inlet Pressure: 3000 PSI (210 BAR)
4500 PSI (310 BAR) Option

Gauges: 2" diameter brass, (chrome plated)

Temperature Range: -40º C to 60º C

Body Ports: ¼" FPT

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

Cv: 0.1

Weight: 2.4 kg

Materials:

Body: Brass bar stock

Bonnet: Brass bar stock

Seat: PTFE
PCTFE with 4500 PSI inlet option

Filter: 10 micron sintered bronze

Diaphragm: 316L stainless steel

Internal Seals: PTFE

ORDERING INFORMATION

S411 - XXX - XXX - XXX - XX

Series	Outlet Pressure	Inlet Fitting	Outlet Fitting	Options
411	**15** (0-15 psi)	**T10** (AS2473 Type 10)	**4F** (1/4" NPT Female)	Inlet Purge
	50 (0-50 psi)	**T20** (AS2473 Type 20)	**2S** (1/8" Tube)	Captured Bonnet Vent
	100 (0-100 psi)	**T30** (AS2473 Type 30)	**4S** (1/4" Tube)	Panel Mount Kit
	150 (0-150 psi)	**T50** (AS2473 Type 50)	**8S** (1/2" Tube)	
	250 (0-250 psi)	**T60** (AS2473 Type 60)	**2B** (1/8" Hose Barb)	
	400 (0-400 psi)	**350** (CGA350)	**4B** (1/4" Hose Barb)	
		540 (CGA540)	**FA** (Fine adjust valve)	
		580 (CGA580)	**4M** (1/4" NPT Male)	
		4F (1/4" NPT Female)	**DK** (1/4" Diaphragm valve)	
		Others by description	**Others by description**	

411 Series Regulator

Dual Stage

Brass Barstock Body

Six-Port Configuration

316L Stainless Steel Diaphragm

411-1331 shown

The 411 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.

Typical Applications

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

Advanced Features

- *Brass barstock body*
  Smooth surface finish
- *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

400 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 flex

Materials

Body
Brass barstock

Bonnet
Chrome-Plated Brass barstock

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

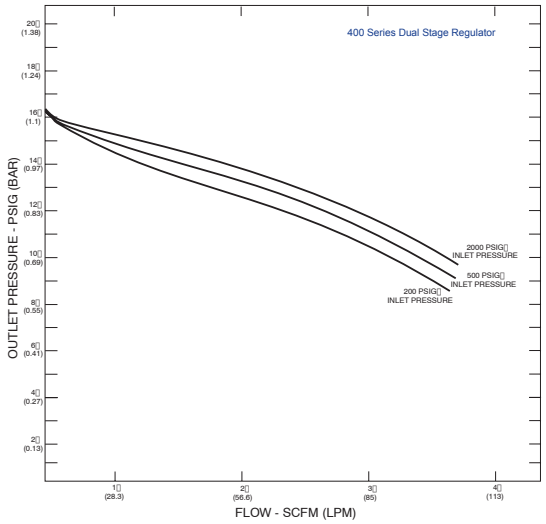
Helium Leak Integrity
1 x 10^{-9} scc/sec

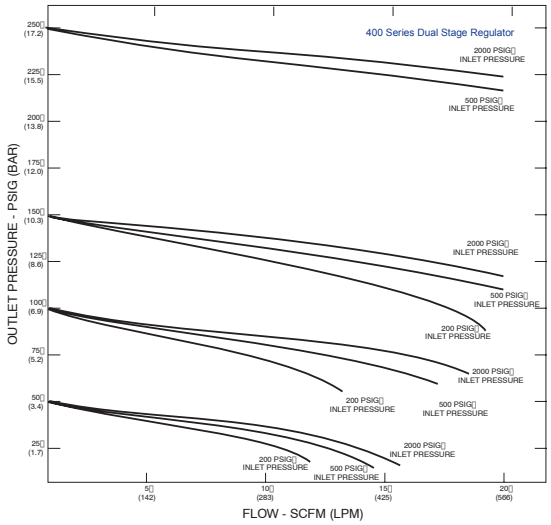
Cv
0.1

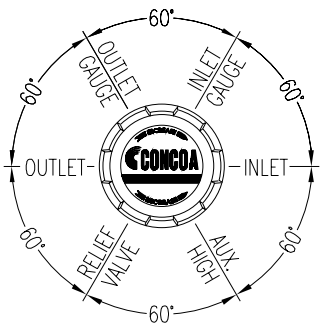
Weight (411-2331-580)
5.3 lbs. (2.40 kg)

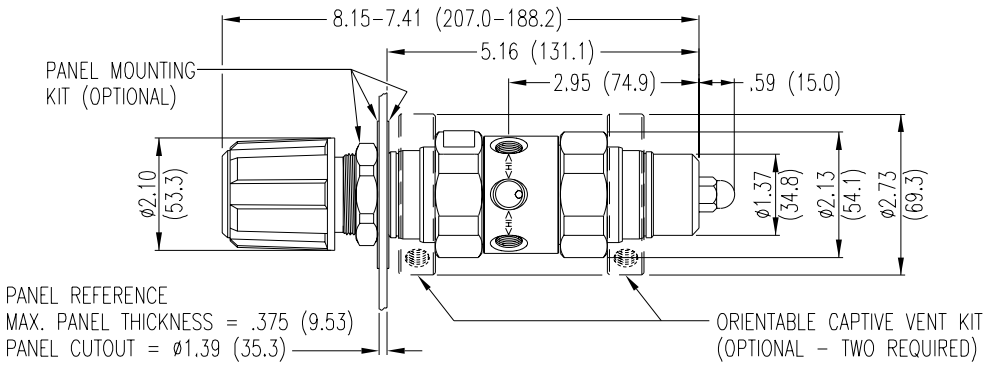
CRN OH 5216.5C

Flow Performance Curves









Ordering Information *(For information about how to use this table please see page 4.)*

411	A	B	C	D	-Inlet	Options
Series 411	**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: 1/8” Tube Fitting 7: 3/8” Tube Fitting 8: Diaphragm Valve 1/8” Tube Fitting 9: Diaphragm Valve ¼” FPT A: 3/8” 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: 1/8” Tube TF4: ¼” Tube TF6: 1/8” 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 **Not available with 4500 PSIG max inlet pressure*

Related Op

- Panel Mount Kit (550-0002)

492 Series Regulator

Single Stage

Piston-Sensed

Ultra-High Pressure

Chrome-Plated Brass Barstock Body

492-5952 shown

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

Typical Applications

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

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

Features

- *Large piston sensor*
  Safely control pressures to 6000 PSIG
- *Capsule® seat*
  Increased serviceability and life
- *Low wetted surface area*
  Minimal purge requirements
- *Field-adjustable pressure limit*
  Safeguard downstream equipment

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 brass

Internal Seals
Viton®

Specifications

Maximum Inlet Pressure
6000 PSIG (420 BAR)

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

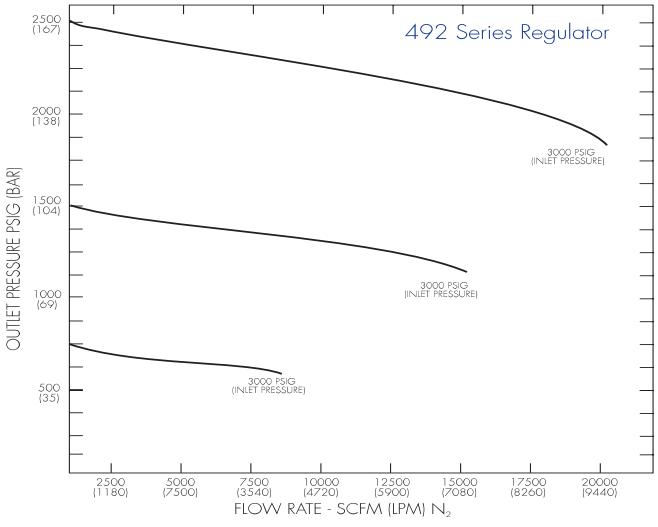
Gauges
2½" diameter chrome-plated brass

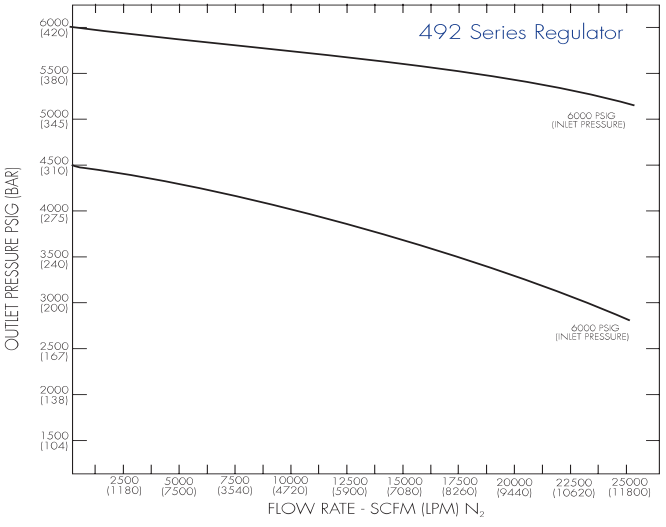
Ports
¼" FPT

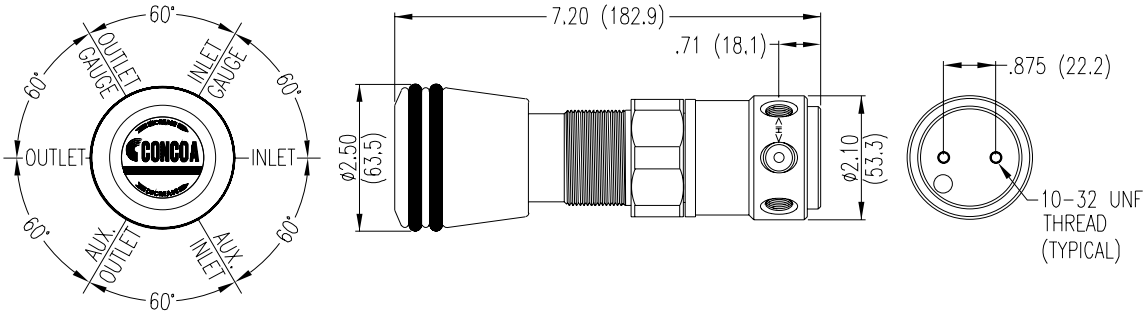
Cv
0.1

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

Flow Performance Curves







Ordering Information *(For information about how to use this table please see page 4.)*

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 Op

- Panel Mount Kit (830-6483)

Silcosteel® Regulators

NEW!

Single and dual stage regulators are now available with Silcosteel® surface treatment. This proprietary passivation process, developed by SilcoTek™, provides excellent inertness for sulfur and mercury calibration standards and improved corrosion resistance over bare 316L stainless steel or other more expensive alloys.

Silcosteel® treated sampling and transfer systems allow oil and gas exploration, chemical and petrochemical plants, and refineries to obtain accurate sulfur and mercury data the first time, every time, with no delay, sample errors, or false readings, down to part-per-billion (ppb) levels. Analysts charged with monitoring sulfur and mercury levels in process streams can save thousands of dollars in improved yields, better test cycle times, and improved system reliability.

Applications:
- CEM Continuous Emission Monitoring
- Environmental Stack and Gas Emission Standards
- Low level sulfur and mercury analysis
- Reactive or corrosive gases
- Off-shore platform systems
- Corrosive and salt water exposure

Outlet pressure: 0 to 100 psig
Outlet gauge: 30" – 0 to 200 psig
Inlet gauge: 0 to 4000 psig
Outlet assembly: diaphragm valve, 1/4" tube fitting

Description	qty.	cat.#	price
Single-Stage Regulator			
CGA 330 (H_2S and other reduced sulfurs)	ea.	21361-5	
CGA 350 (H_2, P_5)	ea.	21361-6	
CGA 660 (NO, NO_2, SO_2)	ea.	21361-11	
Dual-Stage Regulator			
CGA 330 (H_2S and other reduced sulfurs)	ea.	21360-2	
CGA 350 (H_2, P_5)	ea.	21360-7	
CGA 660 (NO, NO_2, SO_2)	ea.	21360-12	

For other CGA fittings, please contact your local Restek representative.

also available

Regulators for use with gas standards.

See **pages 433-434**.

Overview of Restek's Ultra-High Purity (UHP) Gas Regulators

- Regulators feature metal-to-metal seals throughout for long-term leak-tightness.
- Metal diaphragm outlet valve ensures gas purity.
- Each regulator is helium leak-test-certifiable to $1x10^{-8}$ scc/sec.
- Temperature range: -40 °C to 60 °C

Ultra-High Purity (UHP) Brass Body Gas Regulators

UHP brass regulators are the best choice when using ultra-high purity carrier gas for sensitive GC applications using MS, PID, or ECD detection methods. They feature reduced internal dead-volume, relative to stainless steel bodies. The metal valve diaphragm ensures leak-free shut-off. Oxidation-resistant chrome plating maintains a like-new appearance.

Dual-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N_2 He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	21667	
CGA 350 (H_2, P_5)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	21668	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	21669	

Single-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N_2, He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20646	
CGA 350 (H_2, P_5)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20647	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20648	

Ultra-High Purity Chrome-Plated Brass Line Gas Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20 psig (138 kPa) or more.
- Same purity protection as high-pressure cylinder regulators.

Inlet connections: 1/4" FPT
Outlet assembly: 1/4" FPT port

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
1/4" female NPT ports*	0-50psig (0-345kPa)	30" - 0 to 100psig (0-689kPa)	ea.	21666	
1/4" female NPT ports*	0-100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	22452	

*Order appropriate male connector, pipe-to-tube fittings.

Swagelok® Male Connector, Pipe-to-Tube Fittings

23134

23179

Fitting Type	Size (inches)	Similar to Swagelok	Brass qty.	Brass cat.#	Brass price	Stainless Steel qty.	Stainless Steel cat.#	Stainless Steel price
Male Connector	1/4" to 1/4" NPT	400-1-4	10-pk.	23134	$44	2-pk.	23184	
Male Connector	1/8" to 1/4" NPT	200-1-4	10-pk.	23136	$50	2-pk.	23186	
Tube End Reducer	1/4" to 1/8"	200-R-4	5-pk.	23129	$29	2-pk.	23179	

Ultra-High Purity (UHP) Stainless Steel Body Gas Regulators

UHP stainless steel regulators are the standard for ultra-high-purity and corrosion-resistant pressure regulation. They are more easily purged of atmospheric components, compared to brass gas regulators, making them ideal for the most demanding applications. Stainless steel is especially useful in atmospheres of dry corrosive gases such as hydrogen.

Dual-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Most stable outlet pressure control.
- Secondary pressure regulation not needed.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N_2, He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20662	
CGA 350 (H_2, P_5)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20663	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20664	

Single-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N_2, He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20665	
CGA 350 (H_2, P_5)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20666	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20667	

Flexible Stainless Steel Hoses

Description	Length	Fittings	qty.	cat. #	price
Flexible Stainless Steel Hose	36"	1/4" Female NPT	ea.	21339	
Flexible Stainless Steel Hose	18"	1/4" Female NPT	ea.	21340	
Flexible Stainless Steel Hose	36"	Stainless Steel CGA 580	ea.	21344	

Flammable Gas Flash Arrestor—Factory Mutual Approved*

- Gas flow shuts off in the event of a flashback.
- Flame extinguished—flame front prevented from reaching the gas supply.
- No gas flow restriction under normal operating conditions.

Description	qty.	cat.#	price
Flammable Gas Flash Arrestor, Brass Body	ea.	21334	

*Approved for brass body servicing hydrogen, acetylene, propane, or natural gas only.

CGA Fittings

CGA-specified nuts and nipples with internal frit, 1/4-inch NPT nickel-plated brass.

Description	qty.	cat.#	price
CGA 580 Fitting, (N_2, He, Ar)	ea.	21336	
CGA 350 Fitting, (H_2, P_5)	ea.	21337	
CGA 590 Fitting, (Air)	ea.	21338	

ordering **note**

International Fittings

All gas regulators are available with the following BS (British Standard) and DIN (German Industrial Standards Organization) connections. Please contact your local Restek representative for more information.

BS 341 #01	BS 341 #08	BS 341 #15	DIN 477 #06	DIN 477 #10	DIN 477 #14
BS 341 #02	BS 341 #10	DIN 477 #01	DIN 477 #07	DIN 477 #11	DIN 477 #15
BS 341 #03	BS 341 #13	DIN 477 #03	DIN 477 #08	DIN 477 #12	
BS 341 #04	BS 341 #14	DIN 477 #05	DIN 477 #09	DIN 477 #13	

Critical Purity Automatic Switchover System for Noncorrosive Gases


20668580

High-purity automatic switchover systems provide a continuous supply of high purity gas to the laboratory, process, or instrument, to allow you to replace a depleted gas source without interruption in the gas supply. Continuous gas supply is achieved by setting the two regulators at slightly different pressures and discharging one side of the system at a time. These models include flexible, all-stainless-steel pigtails with armor casing. The CGA connection on each pigtail has a check valve in the gland to prevent contamination and minimize purging requirements.

Switching pressure: 200psig/170psig (1379/1172kPa)
Inlet connections: flexible SS pigtails (36")
Line regulator: 0 to 100psig (0-689kPa)

Brass Automatic Switchover System with Line Regulator	qty.	cat.#	price
CGA 580 (N_2, He, Ar)	ea.	20668580	
CGA 350 (H_2, P_5)	ea.	20668350	
CGA 590 (Air)	ea.	20668590	
Stainless Steel Automatic Switchover System with Line Regulator	**qty.**	**cat.#**	**price**
CGA 580 (N_2, He, Ar)	ea.	21593580	

Protocol Station


21347

The protocol station is designed for convenient wall mounting of high-purity gas regulators. Wall mounting provides ease of use, prevents gas regulator damage, and improves safety. Either chrome-plated brass or 316 stainless steel option is complete with a 3-foot, flexible, all-stainless-steel pigtail with armor casing. The CGA connection on the pigtail has an integral check valve in the gland to prevent contamination during cylinder changeout.

Chrome-Plated Brass Protocol Station*	qty.	cat.#	price
CGA 580 (N_2, He, Ar)	ea.	21347	
CGA 350 (H_2, P_5)	ea.	21348	
CGA 590 (Air)	ea.	21349	
Stainless Steel Protocol Station*	**qty.**	**cat.#**	**price**
CGA 580 (N_2, He, Ar)	ea.	21327	

*Pressure regulator not included. Order separately.


21321

Cylinder Valve Wrench

This specially-designed wrench enables easy opening of cylinder valves that are fitted with a hand wheel. It is also suitable for removing difficult cylinder caps.

Description	qty.	cat.#	price
Cylinder Valve Wrench	ea.	21321	


21322

Universal Cylinder Wrench

Use this versatile wrench for tightening gauges and gas regulator CGA fittings to cylinder outlets and pipe thread connections.

Description	qty.	cat.#	price
Universal Cylinder Wrench	ea.	21322	


20635

Backpressure Gas Regulator

Capillary GC inlet systems have backpressure regulators to maintain a constant upstream pressure and rapidly respond to catastrophic leaks. The 0–60 psig (0-414 kPa) operating range is sufficient to operate a 105 m, 0.25 mm ID column at its optimum flow rate.

Description	qty.	cat.#	price
Backpressure Gas Regulator	ea.	20635	

MINICYL Regulator


20610

This compact general purpose regulator has many laboratory applications including air-drying glassware, sparging or evaporating solutions, and controlling pneumatic valves. It is constructed of lightweight aluminum with an elastomer diaphragm. Includes a 0–60 psig (0-414 kPa) gauge and either $^1/_8$- or $^1/_4$-inch tube fittings.

Description	Fittings	qty.	cat.#	price
MINICYL Regulator	$^1/_8$" Fittings	ea.	20610	
MINICYL Regulator	$^1/_4$" Fittings	ea.	20611	


21333


23400


23401


23402

Cylinder Holders, Wall Mounted

Prevent serious injuries! These holders are designed to prevent free-standing gas cylinders from tipping over and injuring personnel. The cast aluminum holder can be secured to a wall or the side of a work bench. Each mount will secure a cylinder 4-15 inches in diameter.

Description	Size	qty.	cat.#	price
Cylinder Holder, Wall Mounted	Single	ea.	21333	
Cylinder Holder, Wall Mounted	Double	ea.	23400	
Cylinder Holder, Wall Mounted	Triple	ea.	23401	
Cylinder Holder, Wall Mounted	Four	ea.	23402	

For these cylinders:

Scotty® (Air Liquide) 14
Contents: 14 liters
Pressure: 240 psig (17 bar)
Outlet Fitting: CGA 160
Weight: 1.5 lbs/0.7 kg
Dimensions: 3" diameter x 11" height (7.6 x 28 cm)
DOT Specifications: 4B240
Please note: This cylinder is not approved for use in Canada.

Scotty® (Air Liquide) 48
Contents: 48 liters
Pressure: 300 psig (21 bar)
Outlet Fitting: CGA 165
Weight: 1.75 lbs/0.8 kg
Dimensions: 4" diameter x 16 1/4" height (10.2 x 41 cm)
DOT Specifications: 39 NRC

Use these regulators:

Regulators
for use with 14-liter and 48-liter Scott (Air Liquide) Transportable Gases

Specifications:
Maximum Inlet Pressure: 300 psig
Outlet Pressure Range: 2–10 psig
Maximum Delivery Pressure: 25 psig
Operating Temperature Range: 35 °F to 150 °F (2 °C to 65 °C)
Outlet Connection: 1/4" female NPT

Materials of Construction:
Body: Brass
Diaphragm: Viton®
Seat: Acetal
Seal: Viton®


22690

Use the CGA 160 inlet connection with 14-liter Scott/Air Liquide Transportable Gases. Use the CGA 165 inlet connection with 48-liter Scott/Air Liquide Transportable Gases.

Description	qty.	cat.#	price
Regulator, CGA 160 Inlet Connection	ea.	22690	
Regulator, CGA 165 Inlet Connection	ea.	22691	


21118

Syringe Adapter Kit for Single-Stage VOC Regulator
Use to withdraw sample from a high-pressure cylinder after pressure reduction through the high-purity VOC single-stage regulator.

Kit contains one nickel-plated brass 1/4" NPT to female luer fitting, which can be used with an A-2 Luer syringe (cat.# 20162 or 20163, see page 385), and one stainless steel 1/4" NPT x 1/8" compression fitting with septum (can be used with any syringe needle).

Description	qty.	cat.#	price
Syringe Adapter Kit	kit	21118	

also **available**

Single-Stage and Dual-Stage Ultra-High Purity Gas Regulators
See pages 309–311.

Gas Regulators for Transportable Cylinders

For this cylinder:

DCG Partnership Cylinders:
Size: 7.6 x 24 cm
CGA-170/110 connection.
US DOT Specs: DOT-4B-240ET

Please note: This cylinder is not approved for use in Canada.

Use this regulator:

Mini-Regulator for natural gas and refinery gas standards
- 0–300 psig inlet pressure range.
- 0–15 psig outlet pressure range.
- Supplied with 0–15 psig outlet pressure gauge, brass CGA 170 nut and nipple.

22032

Description	qty.	cat.#	price
Mini-Regulator	ea.	22032	

For these cylinders:

Spectra (Linde) 104L:
Aluminum construction
Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800 psi
CGA-180 outlet fitting.
Weight: 1.5 lbs/0.7 kg

Scotty® (Air Liquide) 110L
(Pi-marked Cylinders for EU Regulations):
Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 2.2 lbs/1 kg
DOT Specifications: 3AL2216

Use these regulators:

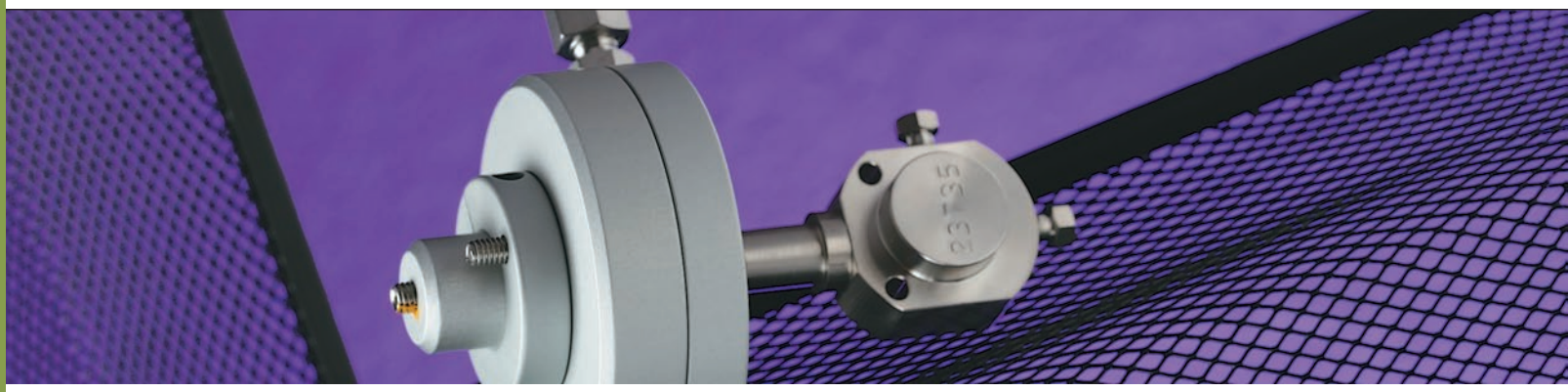
Spectra Gas 7621 High-Purity VOC Regulator
- Single-stage, stainless steel.
- Two pressure gauges and CGA-180 fitting.
- 3,000 psig maximum inlet pressure.
- Stainless steel diaphragm and Kel-F® seat.
- 1/8-inch tube compression outlet.
- Low internal volume: 3.03 cc.
- Accurate pressure control even at low flow rates.
- Individually tested for leaks and impurities.

21572

Description	qty.	cat.#	price
0–30psig outlet pressure gauge	ea.	21572	
0–100psig outlet pressure gauge	ea.	21572-R100	

See next page for a syringe adapter kit.

Continued on next page.



Flow, Pressure, and On/Off Control Devices

This section includes stainless needle valves, our combination on/off needle valves, high pressure prime/purge and on/off valves, and VICI pressure regulators and flow controllers.

Because cast parts can introduce porosity and contamination, every VICI control device is assembled from components which are precision-machined from bar stock. This assures that every item has the same high quality workmanship, with careful assembly and testing to rigid standards.

On/Off and Prime/Purge Valves

Valco high pressure on/off or prime/purge valves feature quality engineering, precision machining, and extremely low internal volume (< 2 µl), making them the ideal choice in the most demanding liquid or supercritical fluid chromatography or extraction systems.* The on/off function is self-explanatory; in prime/purge models, mobile phase flows around the needle when the valve is closed, relieving the back pressure from the column. When the valve opens, mobile phase vents to waste to prime the pump.

Standard models provide leak-tight operation up to 10,000 psi (690 bar) at 100°C, with high temperature versions rated up to 6,000 psi/300°C. A 1/16" fitting model with a larger bore and a 1/8" fitting model are available for high flow applications.

The valve needle is made from a special high strength alloy which is resistant even to the buffer salts which might accidentally precipitate inside the valve. Seals are fluorocarbon, with valve bodies machined from HPLC grade stainless steel, ensuring long lifetime in even the most demanding situations.

The on/off and prime/purge valves are available in manual or air/CO_2 actuated versions. The automated valves require a single three-way solenoid: application of 50 psi opens the valve; venting the air allows the spring to return the valve to the closed position.

*Not suitable for use with gases.

ULTRA-HIGH PRESSURE VALVES
See our new 40,000 psi on/off and prime/purge valves
page 85

On/off valves

SPECS

	Temp	Pressure
Standard temperature		
1/16"	100°C	10,000 psi
High temperature / high pressure		
1/16"	300°C	6,000 psi
1/8"	300°C	2,000 psi

		Manual	Manual with 4" standoff	Air actuated with 1" standoff	Air actuated with 4" standoff
Fitting size	*Bore*	*Prod No*	*Prod No*	*Prod No*	*Prod No*
Standard temperature					
1/16"	0.50 mm	SFVO	–	ASFVO	–
	0.75 mm	SFVOL	–	ASFVOL	–
High temperature / high pressure					
1/16"	0.50 mm	SFVOHT	SFVOHT4	ASFVOHT	ASFVOHT4
	0.75 mm	–	–	ASFVOLHT	ASFVOLHT4
1/8"	1.50 mm	–	–	ASFVO2HT	ASFVO2HT4

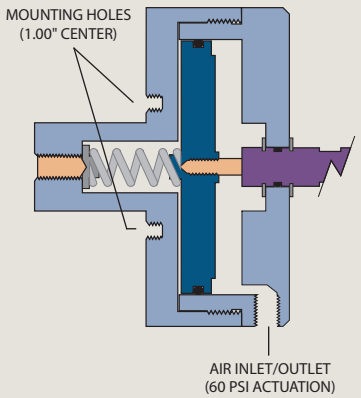
Prime/purge valves

SPECS

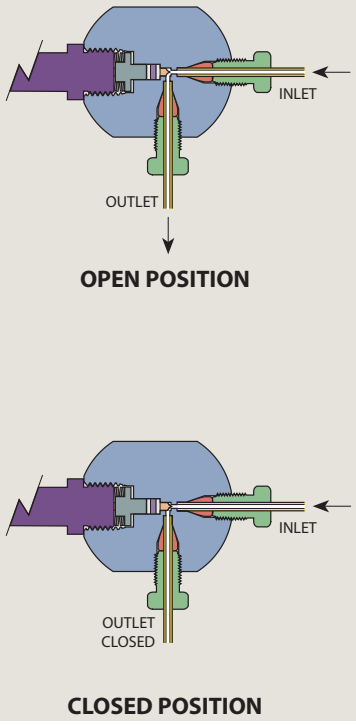
	Temp	Pressure
Standard temperature		
1/16"	100°C	10,000 psi
High temperature / high pressure		
1/16"	300°C	6,000 psi
1/8"	300°C	2,000 psi

		Manual	Air actuated with 1" standoff	Air actuated with 4" standoff
Fitting size	*Bore*	*Prod No*	*Prod No*	*Prod No*
Standard temperature				
1/16"	0.50 mm	SFV	ASFV	–
	0.75 mm	SFVL	ASFVL	–
High temperature / high pressure				
1/16"	0.50 mm	–	ASFVHT	ASFVHT4
	0.75 mm	–	ASFVLHT	ASFVLHT4
1/8"	1.50 mm	–	ASFV2HT	ASFV2HT4

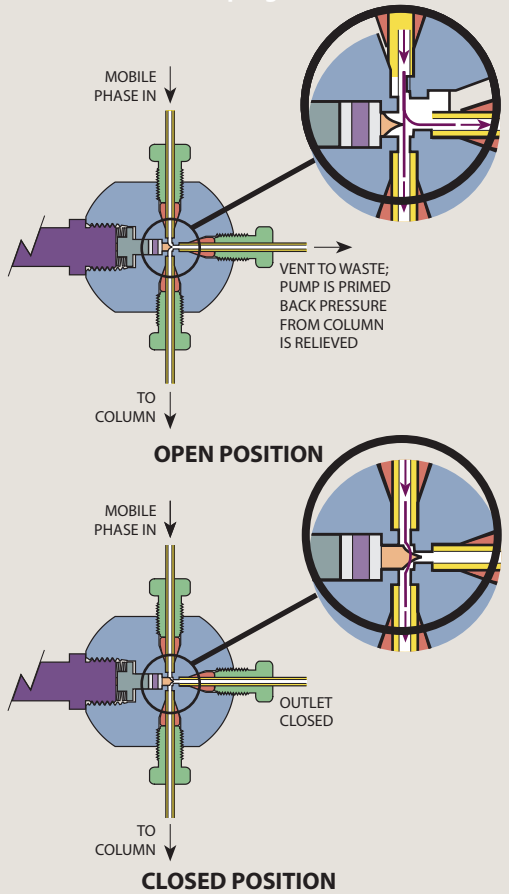
Air actuator option



On/off valve



Prime/purge valve



Combo Valves

A new generation needle and shut-off valve provides screwdriver-adjustable control and positive shut-off without damage to the needle. It is ideal for providing hydrogen and air to an FID, since the flow setting is not changed by turning the valve on and off. It can also be used to supply make-up or combustion gas in a wide variety of applications.

The valve body materials are anodized aluminum or stainless steel, with Viton O-ring seals. Maximum temperature is 100°C, and maximum inlet pressure is 100 psig. The valve can be panel-mounted in an 11/16" or 3/4" hole, using hardware supplied, and all are supplied with Valco 1/16" ZDV fittings. Other configurations are available in OEM quantity upon request.

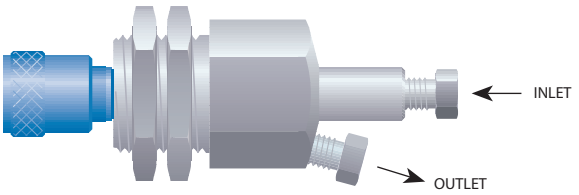
The standard knob is silver-colored and .62" long. Colored knobs for gas identification are available separately, in two lengths.

Combo valves

Maximum flow @ 40 psi He or N_2	Aluminum body	Stainless body
	Prod No	*Prod No*
10 ml/min	CNV1A10S1	CNV1S10S1
50 ml/min	CNV1A50S1	CNV1S50S1
150 ml/min	CNV1A150S1	CNV1S150S1
250 ml/min	CNV1A250S1	CNV1S250S1
500 ml/min	CNV1A500S1	CNV1S500S1

SPECS
Inlet pressure: 100 psi
Maximum temperature: 100°C

Optional colored knobs	Standard (.62")	Long (1.25")
	Prod No	*Prod No*
Green	CNVEKG	CNVEKLG
Red	CNVEKR	CNVEKLR
Blue	CNVEKU	CNVEKLU
Silver	CNVEKS	CNVEKLS
Black	CNVEKB	CNVEKLB



Very similar in function to the Valco combo valves, these are the original, hex-bodied combo valves made by the Condyne division of VICI Metronics for nearly 30 years. Condyne products have been transferred to the Valco Houston location, where a number of improvements have been made.

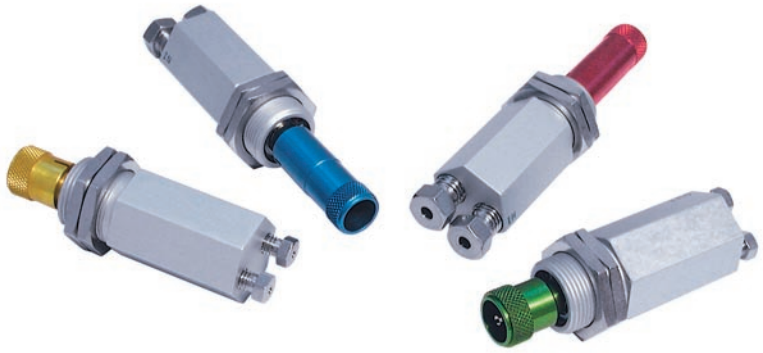
Standard construction features an anodized aluminum body with Viton O-ring seals. Maximum inlet pressure is 100 psi, with a maximum temperature of 100°C. The valve can be panel mounted through an 11/16" or 3/4" diameter hole. Valco 1/16" fittings are standard, but 1/8" fittings are also available. Nuts and ferrules are included.

Typically, the knob color is used as an indicator of the rated flow, but the standard knob can be changed if desired. A longer version of the knob is also available, as is an all brass valve (in OEM quantities). Consult the factory regarding these options.

Condyne combo valves

SPECS
Maximum inlet pressure:
100 psi
Maximum temperature:
100°C

Maximu m flow @ 40psi He or N2	*Knob color*	**1/16" Valco fittings** *Prod No*	**1/8" Valco fittings** *Prod No*
10 ml/min	Green	CVA10GS1	CVA10GS2
50 ml/min	Red	CVA50RS1	CVA50RS2
150 ml/min	Blue	CVA150US1	CVA150US2
500 ml/min	Black	CVA500BS1	CVA500BS2
1 liter/min	Yellow	CVA1KYS1	CVA1KYS2



Gas Flow Controllers

Flow controllers provide a stable flow rate under varying pressure. VICI flow controllers are precision machined from aluminum or stainless bar stock to eliminate the contamination often found in die cast parts. Positive flow shut-off is provided by an integral Viton-sealed adjustment valve.

With all our flow controllers, the inlet pressure must exceed the outlet pressure by 10 psi.

Model 100 gas flow controller

Fixed span upstream referenced flow controller

The Model 100 is available in a variety of preset maximum flow rates, from 150 mL/min to 10 liters/min (N_2 at 40 psi). Any flow controller in this series can be ordered with a 10-turn Spectrol digital dial (3 or 4 digits), to permit a visual indication of the flow setting.

All flow rates listed below are based on N_2 at 40 psi inlet pressure. Maximum inlet pressure is 200 psi.

Flow rate /min	Aluminum body Viton diaphragm Prod No	Aluminum body SS diaphragm Prod No	SS body Viton diaphragm Prod No	SS body SS diaphragm Prod No
With standard control knob				
0 - 150 mL	FC10AV1K	FC10AS1K	FC10SV1K	FC10SS1K
0 - 250 mL	FC10AV2K	FC10AS2K	FC10SV2K	FC10SS2K
0 - 850 mL	FC10AV3K	FC10AS3K	FC10SV3K	FC10SS3K
0 - 1.2 L	FC10AV4K	FC10AS4K	FC10SV4K	FC10SS4K
0 - 4.5 L	FC10AV5K	FC10AS5K	FC10SV5K	FC10SS5K
0 - 10.0 L	FC10AV6K	FC10AS6K	FC10SV6K	FC10SS6K
With Spectrol 3-digit dial				
0 - 150 mL	FC10AV1S3	FC10AS1S3	FC10SV1S3	FC10SS1S3
0 - 250 mL	FC10AV2S3	FC10AS2S3	FC10SV2S3	FC10SS2S3
0 - 850 mL	FC10AV3S3	FC10AS3S3	FC10SV3S3	FC10SS3S3
0 - 1.2 L	FC10AV4S3	FC10AS4S3	FC10SV4S3	FC10SS4S3
0 - 4.5 L	FC10AV5S3	FC10AS5S3	FC10SV5S3	FC10SS5S3
0 - 10.0 L	FC10AV6S3	FC10AS6S3	FC10SV6S3	FC10SS6S3
With Spectrol 4-digit dial				
0 - 150 mL	FC10AV1S4	FC10AS1S4	FC10SV1S4	FC10SS1S4
0 - 250 mL	FC10AV2S4	FC10AS2S4	FC10SV2S4	FC10SS2S4
0 - 850 mL	FC10AV3S4	FC10AS3S4	FC10SV3S4	FC10SS3S4
0 - 1.2 L	FC10AV4S4	FC10AS4S4	FC10SV4S4	FC10SS4S4
0 - 4.5 L	FC10AV5S4	FC10AS5S4	FC10SV5S4	FC10SS5S4
0 - 10.0 L	FC10AV6S4	FC10AS6S4	FC10SV6S4	FC10SS6S4

SPECS

Preset max flow rates:
150 mL/min to 10 liters/min (N_2 at 40 psi).

Maximum inlet pressure:
200 psi

Maximum temperature:
100°C

Standard fittings:
- 1/8" external tube fittings (EAOR22)

Other fittings are available. Contact the factory for further information.

ALTERNATE FITTING TYPES

Models 100 and 300
The standard is the EAOR22 1/8" external tube fitting. Alternative fitting types are listed below. Order separately.

Internal fitting with O-ring seal	Prod No	Price
1/8" to 5/16-24	ZAOR22	$14
1/16" to 5/16-24	ZAOR12	14

Model 202
The standard 1/8" NPT female pipe thread with pipe adapters to 1/16" OD tubing included. Another adapter is listed below. Order separately.

1/8" NPT male pipe to Valco internal	Prod No	Price
1/8"	PZA22	$14

WHICH KIND OF CONTROLLER?

An **upstream-referenced** controller maintains the flow rate as long as the upstream (inlet) pressure is held constant.

A **downstream-referenced** controller maintains a constant flow under constant downstream (outlet) pressure.

Model 202 gas flow controller

Adjustable span upstream-referenced flow controller

SPECS

Flow range:
infinitely adjustable
Min: 5 mL/min
Max: 1.6 L/min
(N_2 at 40 psi)

Maximum inlet pressure:
200 psi

Maximum temperature:
100°C

Standard fittings:
- 1/8" NPT female pipe threads
- Pipe adapters to 1/16" OD tubing are included.

Other fittings are available. *(See facing page.)*

The Model 202 provides a user-variable span adjustment permitting it to be used for a variety of flow ranges. After the span is adjusted, the flow controller has a full 10 turns of resolution between the minimum and maximum flow rates. When equipped with a Spectrol digital dial, settings are reproducible to better than 1%.

	Aluminum body Viton diaphragm	Aluminum body SS diaphragm	SS body Viton diaphragm	SS body SS diaphragm
	Prod No	*Prod No*	*Prod No*	*Prod No*
With standard control knob	FC22AV1K	FC22AS1K	FC22SV1K	FC22SS1K
With Spectrol 3-digit dial	FC22AV1S3	FC22AS1S3	FC22SV1S3	FC22SS1S3
With Spectrol 4-digit dial	FC22AV1S4	FC22AS1S4	FC22SV1S4	FC22SS1S4

Model 300 gas flow controller

Fixed span downstream-referenced flow controller

SPECS

Maximum flow rate:
1.6 L/min
with ambient downstream pressure

Maximum inlet pressure:
200 psi

Maximum temperature:
100°C

Standard fittings:
- 1/8" external tube fittings (EAOR22)

Other fittings are available. *(See facing page.)* Contact the factory for further information.

The Model 300 flow controller provides a stable flow rate when upstream pressure conditions vary, providing the downstream pressure remains constant.

All flow rates listed below are based on N_2 at 40 psi inlet pressure. Maximum inlet pressure is 200 psi.

Flow rate /min	Aluminum body Viton diaphragm *Prod No*	Aluminum body SS diaphragm *Prod No*	SS body Viton diaphragm *Prod No*	SS body SS diaphragm *Prod No*
With standard control knob				
0 - 200 mL	FC30AV1K	FC30AS1K	FC30SV1K	FC30SS1K
0 - 300 mL	FC30AV2K	FC30AS2K	FC30SV2K	FC30SS2K
0 - 800 mL	FC30AV3K	FC30AS3K	FC30SV3K	FC30SS3K
0 - 1.6 L	FC30AV4K	FC30AS4K	FC30SV4K	FC30SS4K
With Spectrol 3-digit dial				
0 - 200 mL	FC30AV1S3	FC30AS1S3	FC30SV1S3	FC30SS1S3
0 - 300 mL	FC30AV2S3	FC30AS2S3	FC30SV2S3	FC30SS2S3
0 - 800 mL	FC30AV3S3	FC30AS3S3	FC30SV3S3	FC30SS3S3
0 - 1.6 L	FC30AV4S3	FC30AS4S3	FC30SV4S3	FC30SS4S3
With Spectrol 4-digit dial				
0 - 200 mL	FC30AV1S4	FC30AS1S4	FC30SV1S4	FC30SS1S4
0 - 300 mL	FC30AV2S4	FC30AS2S4	FC30SV2S4	FC30SS2S4
0 - 800 mL	FC30AV3S4	FC30AS3S4	FC30SV3S4	FC30SS3S4
0 - 1.6 L	FC30AV4S4	FC30AS4S4	FC30SV4S4	FC30SS4S4
With screwdriver adjustable operator				
0 - 750 mL	FC31AV1			

MORE INFORMATION

Male pipe adapters
Internal..... page 38
External 39

Micrometering Valves

Micrometering (needle) valves combine the ease of connection associated with Valco zero dead volume fittings with convenient bulkhead mounting. The very low internal volume and precision design make this valve ideal for use as a gas control valve in chromatographic systems.

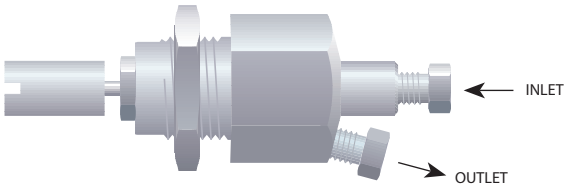
The Viton® model is rated at 225°C, while a version with Kalrez™ seals is capable of continuous operation at 315°C. This allows a needle valve to be mounted directly within a heated oven, facilitating control of flow switching in multidimensional systems while keeping the gases at oven temperature.

Valves are rated for maximum of 1000 psi gas. They are individually tested on a mass spectrometer leak detector to a helium leak rate specification of < 1 x 10^{-8} atm cc/sec.

An unlubricated version with a specially polished seat was designed to be used with our pulsed discharge detectors, and should be used upstream of any ultrapure gas system. There is also a 1/16" tube version.

1/16" micrometering valves *with Valco fittings*

Seal	*Lubrication*	*Prod No*
Standard: 2–225 ml/min@ 15 psi N_2 inlet		
Viton	Lubricated	ZBNV1
Viton	Non-lubricated	ZBNV1-D
Kalrez	Non-lubricated	ZBNV1-KZ
Fine control: 2–175 ml/min@ 15 psi N_2 inlet		
Viton	Lubricated	ZBNV1F
Viton	Non-lubricated	ZBNV1F-D
Kalrez	Non-lubricated	ZBNV1F-KZ
Low flow: 2–90 ml/min@ 40 psi N_2 inlet		
Viton	Lubricated	ZBNV1LF
Viton	Non-lubricated	ZBNV1LF-D
Kalrez	Non-lubricated	ZBNV1LF-KZ



1/16" micrometering valves *with 18" tubes*

Seal	*Lubrication*	*Prod No*
Standard: 2–225 ml/min@ 15 psi N_2 inlet		
Viton	Lubricated	BNV1
Viton	Non-lubricated	BNV1-D
Kalrez	Non-lubricated	BNV1-KZ
Low flow: 2–90 ml/min@ 40 psi N_2 inlet		
Viton	Lubricated	BNV1LF
Viton	Non-lubricated	BNV1LF-D
Kalrez	Non-lubricated	BNV1LF-KZ

Combo Pressure Regulators

The VICI combo regulator is a combination regulator and shut-off valve. The pressure is set using the screwdriver adjustment in the center of the on/off knob. Turning the knob counterclockwise provides positive shutoff, while clockwise rotation restores gas pressure to within 0.05 psi of the setpoint.

The regulator is machined from aluminum bar stock and then hard-anodized to provide contamination-free service. It features a stainless steel diaphragm and Viton®-sealed stainless poppet. The compact size (3" x 1.125" diameter) saves panel space and permits installation anywhere that an 11/16" hole can be located. Mounting hardware is supplied.

Available with outlet pressure ranges of 0-15 psi, 0-30 psi, or 0-60 psi, these regulators can be ordered with 1/16" or 1/8" Valco internal fittings or 1/8" external fittings. Other configurations are available in OEM quantities.

Maximum operating temperature is 100°C, and maximum supply pressure is 250 psig. The influence of supply pressure on outlet pressure is less than 0.1 psi per 10 psi change in supply pressure.

Combo pressure regulators

SPECS

Maximum inlet pressure:
250 psi

Maximum temperature:
100°C

Wetted materials:
- Anodized aluminum
- Stainless steel
- Viton

Pressure range:	**Valco internal fittings 1/16"** *Prod No*	**Valco internal fittings 1/8"** *Prod No*	**External fittings 1/8"** *Prod No*
0-15 psi	PR50A15Z1	PR50A15Z2	PR50A15E2
0-30 psi	PR50A30Z1	PR50A30Z2	PR50A30E2
0-60 psi	PR50A60Z1	PR50A60Z2	PR50A60E2

ADAPTERS USED FOR VALCO AND CONDYNE CONTROL DEVICES

Prod No	*Price*	*Used for*	*Description*
ZAOR11	$14	Diaphragm valve; optional on on/off valves	Valco 1/16" internal to 10-32 female
ZAOR12	14	Optional for Model 100 and 300 flow controllers	Valco 1/16" internal to 5/16-24 O-ring seal
ZAOR22	14	Optional for Model 100 and 300 flow controllers	Valco 1/8" internal to 5/16-24 O-ring seal
EAOR21	14	Air actuated prime/purge and on/off valves	External 1/8" to 10-32 O-ring seal
EAOR22	14	Standard on Model 100 and 300 flow controllers	External 1/8" to 5/16-24 O-ring seal

20L	Steel	CGA-160	240	20	3	13
LB	Steel	CGA-170/180	1800	55	2	15
103L	Steel	C-10**	1000	103	3	14
550L	Steel	***	2200	550	4	24
A58L	Aluminum	C-10**	500	58	3.5	14.5
A76L	Aluminum	C-10**	500	76	4	16
A104L	Aluminum	CGA-180	1800	104	3	12

* CGA-160 = Same as 1/8; FNPT
** C-10 5/8;-18UNF
*** Standard CGA outlet depends on gas composition