



L-102 Catalog

LP-Gas & Anhydrous Ammonia Equipment



Regulators & Accessories

A

Cylinder & Service Valves

B

Multivalve® Assemblies

C

Pressure Relief Valves & Relief Valve Manifolds

D

Globe & Angle Valves

E

Excess Flow, Check, Filler & Pressure Vapor Equalizing Valves

F

Internal Valves & Accessories

G

Adapters, Connectors & Fittings

H

Miscellaneous Equipment (Including Rotogages & ESVs)

J



History

From the company that pioneered propane regulators, you expect nothing less than products that lead the industry. For over 100 years, we have been manufacturing gas regulating equipment to the highest standards of precision and durability—standards that we set.



Quality Design & Manufacturing

Our regulators have stood the test of time. The basic design is ingenious. The materials are top quality. The robot-assisted manufacturing is precise. RegO values the relationships we have with our customers, and we stand behind our products.



Industries Best Partners to Help Support You

Our distributors are the best in the industry. Distributors are indispensable contributors to our success and we treat them as the valuable partners they are. We support our distributors and OEMs with training, inventory and technical support around the world.



10 Year Warranty on All Products

Quality materials, innovations and long lasting design are built into every product we manufacture. That's how we can offer the RegO 10 Year Warranty, double that offered by most manufacturers.



Made in the USA

All of our regulators are designed, assembled and tested in North Carolina. Products Made in the USA allow us to maintain our strict quality control standards that are unmatched by any other company. Every single unit is rigorously tested before it goes out the door.

Determining the Age of Products

All RegO products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of material such as metal and rubber.

The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential.

Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because products are used beyond their safe service life.

The life of a product is determined by the environment in which it "lives." The LP-Gas dealer knows better than anyone what this environment is.

Since 1960, most RegO products are identified with an alphabetical code indicating the month and the year they were manufactured.

Check the product for this code to determine age. If valves or regulators are repainted, take care to keep the date code clear for later identification and inspection.

1960 to 1985 — Two-Letter Date Code

First letter in date code is the month

A — January	G — July
B — February	H — August
C — March	I — September
D — April	J — October
E — May	K — November
F — June	L — December

Relief valves used on ASME tanks carry a numerical code indicating month and year such as 1-75 means January, 1975.

Second letter in date code is the year

R — 1960	A — 1969	J — 1978
S — 1961	B — 1970	K — 1979
T — 1962	C — 1971	L — 1980
U — 1963	D — 1972	M — 1981
V — 1964	E — 1973	N — 1982
W — 1965	F — 1974	O — 1983
X — 1966	G — 1975	P — 1984
Y — 1967	H — 1976	Q — 1985
Z — 1968	I — 1977	

EXAMPLE: DL = April of 1980

From 1985 to 1990 — Digit Date Code

First digit in date code is the month

1 — January	7 — July
2 — February	8 — August
3 — March	9 — September
4 — April	10 — October
5 — May	11 — November
6 — June	12 — December

Second 2 digits in date code are the year

86 — 1986	89 — 1989
87 — 1987	90 — 1990
88 — 1988	

EXAMPLE: 5-87 = May of 1987

After 1990 — Digit-Letter-Digit Date Code

First digit in date code is the month

1 — January	7 — July
2 — February	8 — August
3 — March	9 — September
4 — April	10 — October
5 — May	11 — November
6 — June	12 — December

Letter in date code is the week

A — 1st week
B — 2nd week
C — 3rd week
D — 4th week
E — 5th week

Second 2 digits in date code are the year

91 — 1991	97 — 1997
92 — 1992	98 — 1998
93 — 1993	99 — 1999
94 — 1994	00 — 2000
95 — 1995	01 — 2001
96 — 1996	02 — 2002
03 — 2003	etcetera. . .

EXAMPLE: 6A16 = First week of June, 2016

Regulator Color Coding

RegO Domestic first stage, second stage, single stage, and integral twin stage LP-Gas regulators are easy to identify. In addition to the standard part number marking which indicates the proper application, each regulator is color coded to help minimize misapplication in the field that can lead

to accidents and costly service callbacks. The color coding system is standard on all 404, LV404, 2302, LV2302, 2403, 2503, LV4403, and LV5503 series domestic LP-Gas regulators manufactured after May of 1986.

Classic Gold	Indicates a single stage regulator that is designed to be used alone in single stage systems.
Brilliant Red	Denotes a first stage high pressure regulator, normally used in two-stage applications in conjunction with a select brown second stage regulator.
Select Brown	Signifies second stage low pressure regulators, designed for use in two-stage systems in conjunction with a brilliant red high pressure regulator — also signifies integral twin stage regulators designed to provide benefits of two-stage regulation in one compact unit.
Select Blue	Indicates a second stage 2 psig (0.14 barg) delivery pressure regulator and a line pressure regulator downstream to reduce 2 psig (0.14 barg) to appliance pressure
Green	High pressure pounds to pounds anhydrous ammonia regulator.

Limited 10 Year Warranty and Limitation Of Liability

LIMITED 10 YEAR WARRANTY

RegO warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships the product to RegO at 100 RegO Drive, Elon, NC 27244, RegO, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used after installation in accordance with RegO's printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

Except as expressly set forth above, and subject to the limitation of liability below, RegO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, with respect to its products and parts, whether used alone or in combination with others. RegO disclaims all warranties not stated herein.

LIMITATION OF LIABILITY

RegO's total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such cause be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO shall not be liable for incidental, consequential or punitive damages or other losses. RegO shall not be liable for, and buyer assumes any liability for, all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO for technical advice based upon limited facts disclosed to RegO. If RegO furnishes technical advice to buyer, whether or not at buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from State to State. The portions of this limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

WARNING

All RegO products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of material such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of RegO products. Since most users have purchased these products from RegO distributors, the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing and return the product to the distributor from whom he purchased the product/part. The distributor may or may not at the distributor's option choose to submit the product/parts to RegO, pursuant to this Limited Warranty. Failure by buyer to give such written notice within thirty (30) days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product/parts by RegO's distributor for replacement or repairs under the terms of RegO's Limited Warranty in no way determines RegO's obligations under this Limited Warranty.

Because of a policy of continuous product improvement, RegO reserves the right to change designs, materials or specifications without notice.



Foreword

This catalog describes a complete line of equipment available from RegO® for use with Liquid Propane (LP)-Gas and anhydrous ammonia (NH₃). The following points are important to know for proper use of the catalog:

1. Illustrations and drawings of individual products are representative of "product groups" and all products within a product group are similar in construction.
2. Materials used for construction of products in this catalog are suitable for rated service pressure at temperatures of -40°F to +165°F, unless otherwise specified.
3. Products in this catalog are only intended for use in LP-Gas and/or anhydrous ammonia service as follows.
 - a. "A" or "AA" prefix — Products with this prefix are suitable for NH₃ service (i.e., contain no brass parts).
 - b. "AA" prefix on relief valves — These valves are NOT suitable for use with LP-Gas service. These are of partial aluminum materials and are listed by Underwriters Laboratories (UL) for NH₃ service only.
 - c. All other products including "A" prefix are suitable for use with LP-Gas & NH₃ service.
 - d. "SS" prefix—Hydrostatic relief valve with this prefix are suitable for NH₃ and LP-Gas service (i.e., they have stainless steel materials).
4. We manufacture valves and adapters designed to be used on LP-Gas and Anhydrous Ammonia systems, we do not design systems or consult in system design. For this type of information consult a professional Engineer.

Caution

Do not use any product contained in this catalog with any service commodity other than LP-Gas or NH₃. If you have a need for use of another application, contact RegO, 100 RegO Drive, Elon, NC 27244, (336) 449-7707 ecii@regoproducts.com before proceeding.

Proper application, installation and maintenance of products in this catalog are essential. Users of these products should obtain further information if there are any doubts or questions.

Warning

All RegO products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO products are manufactured for storage, transport, transfer and use of toxic flammable and dangerous liquids and gases. Such substances should be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures. Never vent LP-Gas near any possible source of ignition.

Notice

Installation, usage, and maintenance of all RegO products must be in compliance with all RegO instructions as well as requirements and provisions of NFPA #54, NFPA#58, DOT, ANSI, and all applicable federal, state, provincial and local standards, codes, regulations, and laws.

Inspection and maintenance on a periodic basis is essential. Installation and maintenance should be performed only by qualified personnel.

Be sure all instructions are read and understood before installation, operation and service.

Filters

RegO LP-Gas equipment is designed to operate in a system free from contamination. A variety of in-line filters are commercially available to the LP-Gas industry for installation in domestic systems.

The use of an in-line filter should be considered when other system components may be unclean and the system contaminated by rust, scale, dirt, debris or other foreign material.

RegO Regulator Dependability

When RegO LP-Gas Regulators are properly installed, safe, precise, trouble-free service is the result.

Dependability is built into every regulator ... the result of rigid standards of quality control and close tolerance machining. And this has been true for more than 90 years.

RegO Products are manufactured from the finest materials, and assembled and tested using procedures second to none.

RegO Regulator Selection

In order to properly size the RegO Regulator, find the total load of the installation. The total load is calculated by adding up the input ratings (BTU or CFH) of all appliances in the installation. Input ratings may be obtained from the nameplates on the appliances or from the manufacturers' literature.

Determine the type of regulation needed referring to the chart below.

Type of System	Maximum Load	Suggested Regulator
First Stage in a Two Stage System	1,500,000	LV3403TR
	2,500,000	LV4403SR Series LV4403TR Series
Second Stage in a Two Stage System	450,000	LV3403B Series LV3403BR Series
	935,000	LV4403B Series LV4403BD Series
	1,600,000	LV5503B4/B6
	2,300,000	LV5503B8
Second Stage in a 2 psig System	1,000,000	LV4403Y4/Y46R
	2,200,000	LV5503Y6/Y8
Integral Twin Stage	450,000	LV404B34/39 Series
	525,000	LV404B4/B9 Series
Integral Twin Stage 2 psig Delivery	800,000	LV404Y9
	650,000	LV404Y39
Automatic Changeover	400,000	7525B34 Series
	450,000	7525B4 Series

* See catalog page for inlet and delivery specifications.

Now determine which regulator in the Series would be most suitable. Turn to the individual product pages and refer to the Performance Curves. Check the performance of the regulator with your actual load conditions at the minimum LP-Gas inlet pressure for the regulator. Use the pressure corresponding to your lowest winter temperatures shown in the chart below or refer to the delivery pressure of your first stage regulator.

Temperature		Approx. Pressure (psig)		Approx. Pressure (barg)		Temperature		Approx. Pressure (psig)		Approx. Pressure (barg)	
°F	°C	Propane	Butane	Propane	Butane	°F	°C	Propane	Butane	Propane	Butane
-40	-40	3.6		0.25		40	4	72	3.0	4.96	0.21
-30	-34	8		0.55		50	10	86	6.9	5.93	0.48
-20	-29	13.5		0.93		60	16	102	12	7.03	0.83
-10	-23	23.3		1.61		70	21	127	17	8.76	1.17
0	-18	28		1.93		80	27	140	23	9.65	1.59
10	-12	37		2.55		90	32	165	29	11.38	1.99
20	-7	47		3.24		100	38	196	36	13.51	2.48
30	-1	58				110	43	220	45	15.17	3.10

Example for a First Stage Regulator

1. Assume a load of 500,000 BTU's per hour.
2. Assume a minimum delivery pressure of 9.5 PSIG (0.66 BARG).
3. Assume a minimum tank pressure of 15 PSIG (1.03 BARG).
4. For these conditions, refer to chart for the LV4403TR Series, First Stage Regulator, shown below.

All give you a product that provides accurate gas delivery under varying pressure ranges and load conditions.

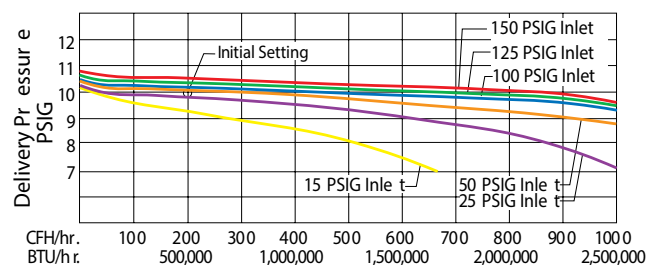
RegO LP-Gas Regulators are UL listed and comply with applicable code requirements.

RegO Products offer a complete line of LP-Gas Regulators with capacities for almost every application.

5. Find the line on the chart corresponding to the lowest anticipated winter tank pressure (note that each performance line corresponds to and is marked with a different inlet pressure in psig).
6. Draw a vertical line upward from the point of assumed load (500,000 BTU's per hour) to intersect with the line corresponding to the lowest tank pressure.
7. Read horizontally from the intersection of these lines to the delivery pressure at the left side of the chart. In this example the delivery pressure will be 9.7 PSIG (0.67 BARG). Since the delivery pressure will be 9.7 PSIG (0.67 BARG) at the maximum load conditions and lowest anticipated tank pressure, the regulator will be sized properly for the demand.

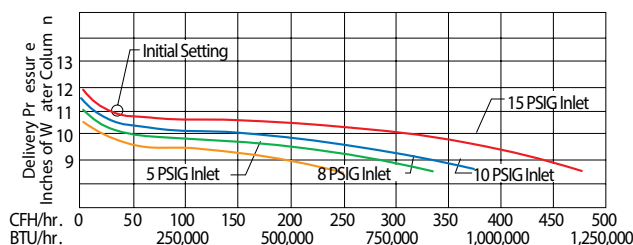
Example for a Second Stage Regulator

LV4403TR Series First Stage Regulator

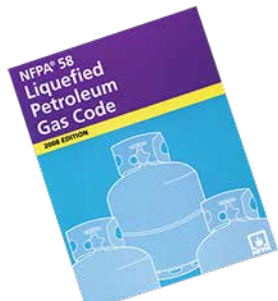


1. Assume load of 250,000 BTU's per hour.
2. Assume a minimum delivery pressure of 10" w.c. (24.88 MBar)
3. Assume a minimum inlet pressure of 10 PSIG (0.69 BARG).
4. For these conditions, refer to chart for the LV4403B Series, Second Stage Regulator, shown below.
5. Find the line on the chart corresponding to the anticipated inlet pressure.
6. Draw a vertical line upward from the point of assumed load (250,000 BTU's per hour) to intersect with the line corresponding to the lowest inlet pressure.
7. Read horizontally from the intersection of these lines to the delivery pressure at the left side of the chart. In this example the delivery pressure will read 10.6" w.c. (26.38 MBar) Since the delivery pressure will be 10.6" w.c. (26.38 MBar) at the maximum load condition and lowest anticipated inlet pressure, the regulator is sized properly for the demand.

LV4403B Series Second Stage Regulator



Safety Warnings



Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

Nature of Warnings

It is recognized that warnings should be as brief as possible, but the factors involved in regulator failures are not simple. They need to be fully understood so that proper maintenance programs can be established. If there is a simple warning, it would be:

Inspect regulators regularly as outlined in this safety warning and replace as required per these recommendations. When all of these recommendations are followed, the recommended service life of an RegO regulator (except single stage) manufactured after 1995 is 25 years. The recommended service life of all other RegO regulators is 15 years.

LP-Gas Regulators

This bulletin applies most particularly to permanent LP-Gas installations of cylinders and tanks. The warnings also apply in most cases to portable installations of recreational vehicles, barbecue grills, etc.

This bulletin is not intended to be an exhaustive treatment of the subject of regulators and certainly does not cover all safety practices that should be followed in the installation and maintenance of LP-Gas systems.

It should not be necessary to remind readers of this bulletin that regulators must be installed in strict conformance with NFPA Pamphlets 54 and 58, and all other applicable codes and regulations. Codes, regulations and manufacturer's recommendations have been developed by experts with many years of experience in the LP-Gas industry.

Failure to fully follow these codes, regulations and recommendations could result in hazardous installations.

Pamphlet 58 states "All regulators for outdoor installations, except regulators used for portable industrial applications, shall be designed, installed or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud or debris). This protection may be integral with the regulator."

Failed and/or Inoperative Regulators

Failed regulators can cause three kinds of hazards:

- High pressure LP-Gas in a system downstream of the regulator; and
- Leaks of LP-Gas to atmosphere from the regulator itself.
- Loss of pressure due to a "freeze-up" in the orifice.

High Pressure LP-Gas in a System

Anything that prevents a regulator from regulating properly could result in high pressure gas at the regulator outlet and thus in a system.

High pressure gas into piping and appliances could cause piping leaks and damage to appliance burner controls with the potential for fires and explosions.

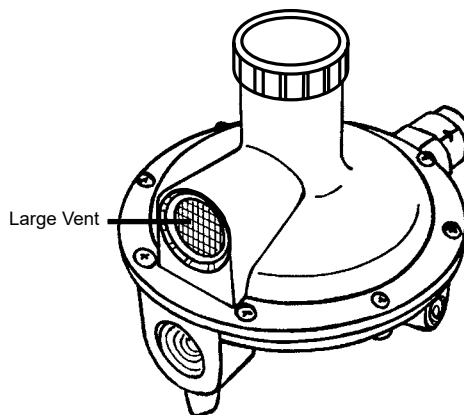
The Causes of High Pressure Gas in a System are:

1. Regulator vents that are clogged or obstructed.

Vents must be clear and fully open at all times.

Many regulators are equipped with a pressure relief valve which discharges to atmosphere through the vent. Ice, snow drifts, dirt, bugs, paint, or other foreign material can clog the vents.

An obstructed vent may prevent the pressure relief valve from operating properly.



Regulators should be installed with the vent facing down or protected so their operation will not be affected by the elements. In cases where the regulator vent is equipped with a discharge tube, the outlet of this tube must be facing down. The vents and/or discharge tubes must be protected from the elements and must be equipped with a screen to prevent bugs from obstructing the opening.

Action Required: Regulators should be properly installed and regularly inspected when tanks or cylinders are filled. If vents are clogged or the screen is missing, they must be cleaned or replaced. If the vent screen is missing and there is evidence of foreign material around the vent, the regulator should be replaced.

2. Foreign material lodging between the regulator nozzle and seat disc:

When this occurs, the regulator can remain open, allowing high pressure gas into the system.

Safety Warnings

This material can come from system piping between the container shut-off valve and the regulator. Chips created during piping installation or dirty piping can create this hazard. Corrosion inside of copper pigtails and piping can cause problems. This can occur particularly when LP-Gas contains high sulphur or excessive moisture.

Action Required: Make sure regulator inlet piping is clean at the time of installation. Periodic checks should be made to ensure piping remains clean without corrosion. Never use old pigtails on new LP-Gas installations. Old pigtails can also work harden and crack if they have been bent and twisted several times.

3. Wrong regulator installed for the application:

The proper regulator must be used for each system.

For example, installation of high pressure regulators not designed to reduce gas pressure to an appliance requirement of 11" w.c. (27.37 MBar) will cause a hazard. Installing a regulator undersized for the load can cause improper combustion at the appliance burner with a potential for carbon monoxide poisoning.

Action Required: Make sure the regulator is correct for each application and test the system with a pressure gauge or a manometer.

4. Failure to external mechanical parts due to corrosion:

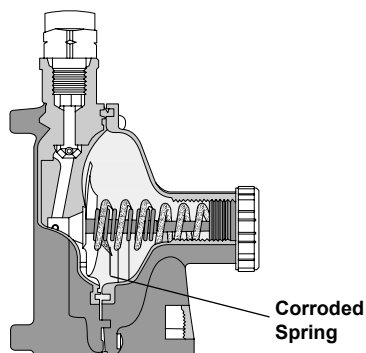
Adjusting springs and relief valve springs can rapidly corrode if exposed to salt air or industrial pollution. Even moisture condensation on these springs can cause them to rust and fail.

Failure of these springs will result in failure of the regulator to control the pressure.

With the vent of a regulator facing down, corrosion products from the springs could clog the regulator vent screen blocking the vent.

Action Required: Regulator inspection for corrosion should be made according to the guidelines listed below:

- For underground installations subject to submersion, the regulator should be inspected **every** time the container is filled.
- For known corrosive atmospheres of salt air or chemical pollution, the regulator should be inspected at least once a year.

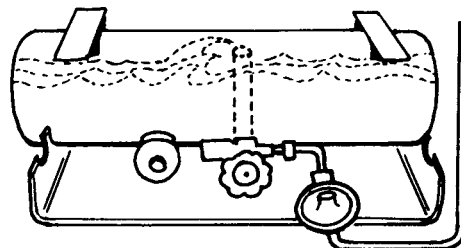


- For other applications, the regulator should be inspected every 3 years. **If any corrosion is evident, replace the regulator.**

It is essential that the regulator bonnet cap be tightly in place at all times to prevent the entrance of water, bugs, dirt, etc. Foreign material can cause the regulator to function improperly with potentially hazardous results.

5. Liquid propane in the regulator:

This can occur on recreational vehicles, unless the regulator is installed substantially higher than the container shut-off valve. Here, sloshing propane could get into the regulator with the resulting high pressure downstream of the regulator. It could also occur on stationary installations if the regulator is installed below the shut-off valve and the container is over-filled.



Action Required: Be careful of regulator installation and never overfill any LP-Gas container.

Leaks of LP-Gas to Atmosphere

While the occurrences of leaking regulators are rare, they can and do occur with a potential for fires and explosions.

These leaks can be caused by:

1. Corrosion of the relief valve spring or foreign material on the seat disc which causes the relief valve to open, will cause LP-Gas to escape through the regulator vent, as well as permitting high pressure into the system.

Action Required: Regulator inspection for corrosion should be made according to the guidelines listed below:

- For underground installations subject to submersion, the regulator should be inspected **every** time the container is filled.
- For known corrosive atmospheres of salt air or chemical pollution, the regulator should be inspected at least once a year.
- For other applications, the regulator should be inspected every 3 years.

If any corrosion is evident, replace the regulator.

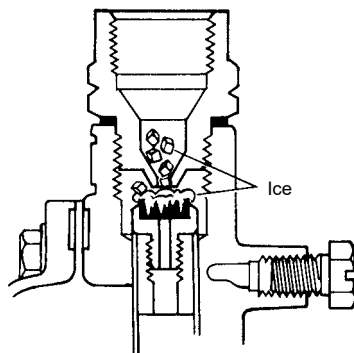
2. Bad piping connections at the regulator inlet and outlet. This can occur at the time of installation where connections are loose or the regulator may have been overstressed by excessive wrenching. It is important that proper wrenches, both on the piping and on the regulator inlet and outlet, be used when connecting the system piping, and that the regulator die cast body is not cracked by wrenching the pipe too deeply into the body.

Action Required: Always test for leaks at time of installation and inspect for leaks if there is reason to believe that pipe connections could cause a hazard.

Safety Warnings

Loss of Pressure

Freeze-up inside the regulator.



This will prevent the regulator from regulating properly.

Regulator freeze-ups occur because there is excessive moisture in the gas. Freeze-ups can also occur in pigtails that are kinked or bent where free flow of the LP-Gas is restricted. These freeze-ups can occur when the moisture, gas flow and temperature combine to create a hazardous condition. Freeze-ups can occur at temperatures above 32° F.

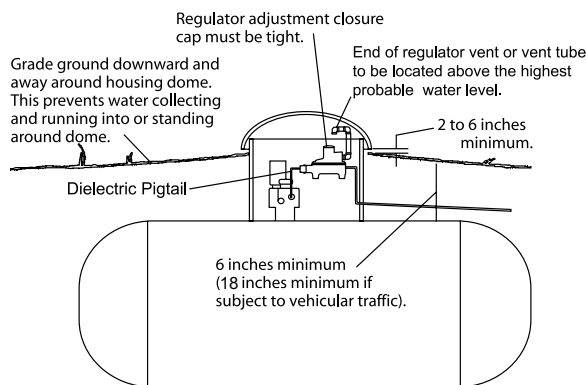
Action Required: All LP-Gas should be checked for moisture content prior to delivery to consumers and proper amounts of anhydrous methanol added if the gas cannot be returned to the supplier. Any container suspected of having excessive moisture should be treated with the proper amount of methanol.

Underground Installations

Special hazards can occur if regulators are not properly installed in underground systems. Water, dirt, mud and insects can get into the regulator if the bonnet cap is not tightly in place and the vent is not protected with a proper vent tube, opening above any potential water level.

Most problems occur because the waterproof dome on the buried storage tank does not extend above the ground level sufficiently to keep out water and mud.

Refer to NPGA No. 401.



Note: Water mark left in housing dome at level above regulator vent, or end of vent tube requires replacement of regulator. Then correct installation.

Customer Safety

Since regulators are often used by consumers without previous knowledge of the hazards of LP-Gas, and the LP-Gas dealers are the only ones who have direct contact with the consumers,

It is the dealer's responsibility to make sure that his customers are properly instructed in safety matters relating to their installation.

At the very minimum, it is desirable that these customers:

1. Know the odor of LP-Gas and what to do in case they smell gas. Use the NPGA "Scratch 'n Sniff" leaflet.
2. Are instructed to never tamper with the system.
3. Know that when protective hoods are used to enclose regulators and/or valves, that these hoods must be closed, but not locked.
4. Keep snow drifts from covering regulators.
5. Know the location of the cylinder or tank shut-off valve in emergencies.

General Warning

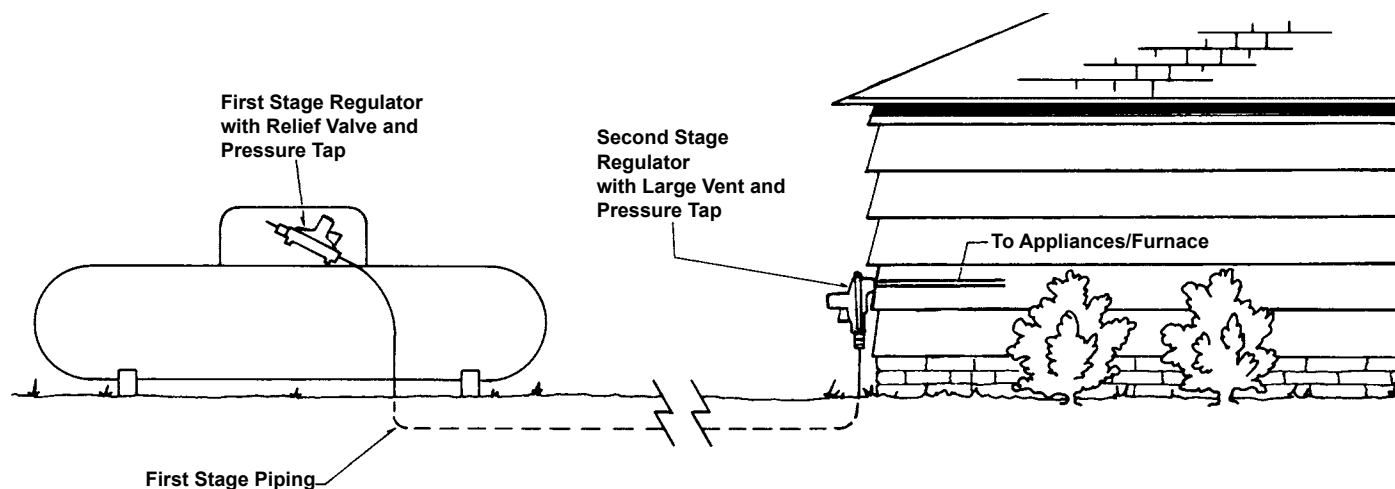
All RegO Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber. As a general recommendation, Regulators should be replaced in accordance with all of the recommendations outlined in this safety warning. The recommended service life of a regulator is one of many factors that must be considered in determining when to replace a regulator.

The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential.

Because RegO Products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a regulator is used beyond its safe service life. Life of a regulator is determined by the environment in which it "lives." The LP-Gas dealer knows better than anyone what this environment is.

NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could affect them.

Advantages of Two-Stage Regulation



The regulator is truly the heart of an LP-Gas installation. It must compensate for variations in tank pressure from as low as 8 PSIG to 220 PSIG (0.55 TO 15.17 BARG) – and still deliver a steady flow of LP-Gas at 11" w.c. (27.37 MBar) to consuming appliances. The regulator must deliver this pressure despite a variable load from intermittent use of the appliances.

Though a single-stage system may perform adequately in many installations, the use of a two-stage system offers the ultimate in pin-point regulation. Two-stage regulation can result in a more profitable LP-Gas operation for the dealer resulting from less maintenance and fewer installation callbacks – and there is no better time than now for installing RegO Regulators in two-stage systems.

Uniform Appliance Pressure

The installation of a two-stage system – one high pressure regulator at the container to compensate for varied inlet pressures, and one low pressure regulator at the building to supply a constant delivery pressure to the appliances – helps ensure maximum efficiency and trouble-free operation year-round. It is important to note that while pressure at the appliances can vary up to 4" w.c. (9.95 MBar) using single-stage systems, two-stage systems keep pressure variations within 1" w.c. (2.49 MBar). New high-efficiency appliances require this closer pressure control for proper ignition and stable, efficient operation. In fact, one major manufacturer requires the use of two-stage systems with their appliances.

Reduced Freeze-ups/Service Calls

Regulator freeze-up occurs when moisture in the gas condenses and freezes on cold surfaces of the regulator nozzle. The nozzle becomes chilled when high pressure gas expands across it into the regulator body. This chilling action is more severe in single-stage systems as gas expands from tank pressure to 11" w.c. (27.37 MBar) through a single regulator nozzle.

Two-stage systems can greatly reduce the possibility of freeze-

ups and resulting service calls as the expansion of gas from tank pressure to 11" w.c. (27.37 MBar) is divided into two steps, with less chilling effect at each regulator. In addition, after the gas exits the first-stage regulator and enters the first-stage transmission line, it picks up heat from the line, further reducing the possibility of second-stage freeze-up.

Service calls for pilot outages and electronic ignition system failures are also reduced as a result of more uniform appliance pressure from two-stage systems.

Economy of Installation

In a single-stage system, transmission line piping between the container and the appliances must be large enough to accommodate the required volume of gas at 11" w.c. (27.37 MBar). In contrast, the line between the first and second stage regulators in two-stage systems can be much smaller as it delivers gas at 10 PSIG (0.69 BARG) to the second-stage regulator. Often the savings in piping cost will pay for the second regulator.

As an additional benefit, single-stage systems can be easily converted to two-stage systems using existing supply lines when they prove inadequate to meet added loads. This is the least expensive and best method of correcting the problem.

Allowance for Future Appliances

A high degree of flexibility is offered in new installations of two-stage systems. Appliances can be added later to the present load – provided the high pressure regulator can handle the increase – by the addition of a second low pressure regulator. Since appliances can be regulated independently, demands from other parts of the installation will not affect their individual performances.

Size The System Correctly

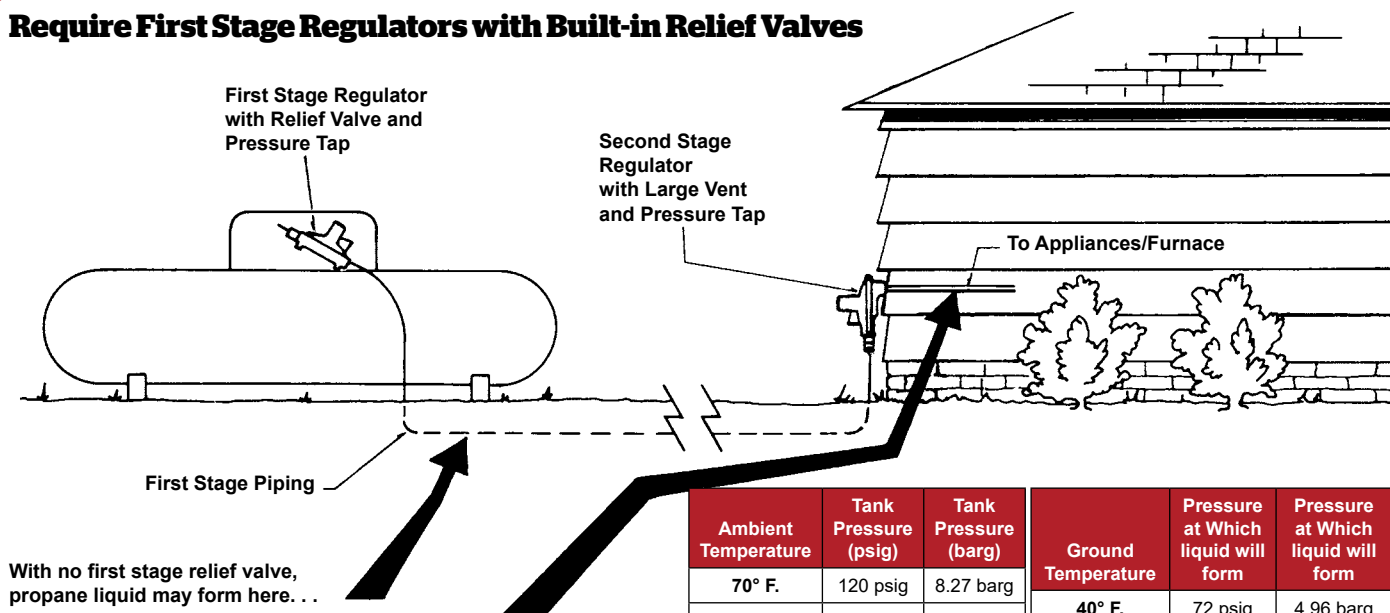
Prior to installing your two-stage system, be sure the system pipe and tubing is properly sized. Proper sizing will help ensure constant delivery pressure to the appliances during fluctuating loads at all times. Just as important, be sure the RegO Regulators you choose are capable of handling the desired load. This is another advantage of two-stage systems – they are capable of handling much more BTU's/hr. than single-stage systems. The RegO "LP-Gas Serviceman's Manual" provides complete information on pipe sizing and proper regulator selection.

Replace Pigtails

If you are replacing an old regulator, remember to replace the copper pigtail. The old pigtail may contain corrosion which can restrict flow. In addition, corrosion may flake off and wedge between the regulator orifice and seat disc – preventing proper lock-up.

Two-Stage LP-Gas Systems

Require First Stage Regulators with Built-in Relief Valves

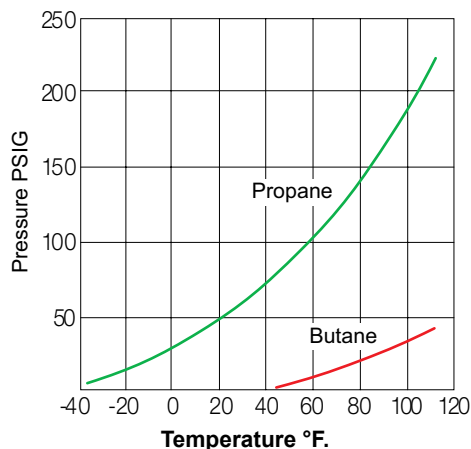


Resulting in sudden pressure surge due to flashing into vapor here! First stage relief can prevent liquid from forming in first stage piping during periods with no gas demand! ! !

Ambient Temperature	Tank Pressure (psig)	Tank Pressure (barg)	Ground Temperature	Pressure at Which liquid will form	Pressure at Which liquid will form
70° F.	120 psig	8.27 barg	40° F.	72 psig	4.96 barg
80° F.	140 psig	9.65 barg	50° F.	86 psig	5.93 barg
90° F.	165 psig	11.38 barg	60° F.	102 psig	7.03 barg

Pressure at which liquid can form at various temperatures.

Vapor Pressures of LP-Gases



The Problem

Many modern LP-Gas appliances are equipped with pilotless ignition systems. Water heaters and older appliances use pilot lights, but it has become a common practice for energy conscious homeowners to shut-off the pilot when leaving home for extended periods of time. In each instance, there is **no gas demand at all** for extended periods.

The Consequences

If the first stage regulator fails to lock-up tight, usually as a result of a worn seat disc or foreign material lodged between nozzle and seat disc, pressure will build-up in the first stage piping – possibly to a level that approaches tank pressure. Combining this with warm ambient temperatures and cool ground, **propane liquid may form** in the first stage piping.

When gas demand resumes, this liquid may pass through the second stage regulator into the appliances and furnace. NOTE – the second

stage regulator will not relieve the pressure in first stage piping. The rapid vaporization of the liquid may cause a rapid pressure surge that could seriously damage critical components of the appliance and furnace controls.

A fire or explosion could occur as a consequence.

The Solution

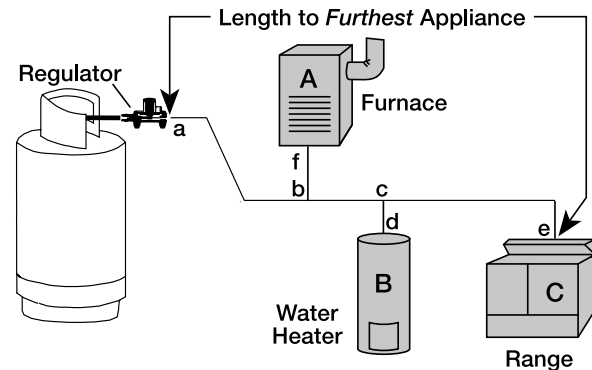
RegO LV4403 Series First Stage Regulators with Built-In Relief Valves reduce the possibility of this serious hazard in two stage applications. The built-in relief valve is designed to vent as needed and reduce the possibility of first stage piping pressure from becoming high enough to form liquid.

Pipe and Tubing Selection Guide

Use the following simple method to ensure the selection of the correct sizes of piping and tubing for LP-Gas vapor systems. Piping between the first and second stage is considered, as well as lower pressure (2 psig) (0.14 barg) piping between the 2 psig (0.14 barg) second stage or integral twin stage regulator and the line pressure regulator; and low pressure (inches of water column) piping between second stage, single stage, or integral twin stage regulators and appliances. The information supplied below is from NFPA 54 (National Fuel Gas Code) Appendix C, and NFPA 58 (Liquefied Petroleum Gas Code) Chapter 15; it can also be found in CETP (Certified Employee Training Program) published by the Propane Education and Research Council "Selecting Piping and Tubing" module 4.1.8. These illustrations are for demonstrative purposes, they are not intended for actual system design.

Instructions:

- Determine the total gas demand for the system by adding up the BTU/hr input from the appliance nameplates and adding demand as appropriate for future appliances.
- For second stage or integral twin stage piping:
 - Measure length of piping required from outlet of regulator to the appliance furthest away. No other length is necessary to do the sizing.
 - Make a simple sketch of the piping, as shown.
 - Determine the capacity to be handled by each section of piping. For example, the capacity of the line between a and b must handle the total demand of appliances A, B, and C; the capacity of the line from c to d must handle only appliance B, etc.
 - Using Table 3 select proper size of tubing or pipe for each section of piping, using values in BTU/hr for the length determined from step #2-A. If exact length is not on chart, use next longer length. Do not use any other length for this purpose! Simply select the size that shows at least as much capacity as needed for each piping section.
- For piping between first and second stage regulators
 - For a simple system with only one second stage regulator, merely measure length of piping required between outlet of first stage regulator and inlet of second stage regulator. Select piping or tubing required from Table 1.
 - For systems with multiple second stage regulators, measure length of piping required to reach the second stage regulator that is furthest away. Make a simple sketch, and size each leg of piping using Table 1, 2, or 3 using values shown in column corresponding to the length as measured above, same as when handling second stage piping.

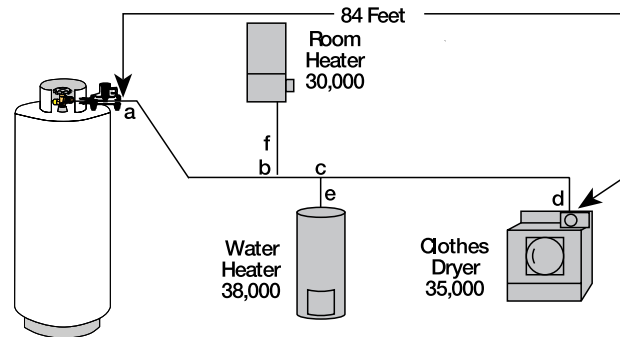


Example 1

Determine the sizes of piping or tubing required for the twin-stage LP-Gas installation shown.

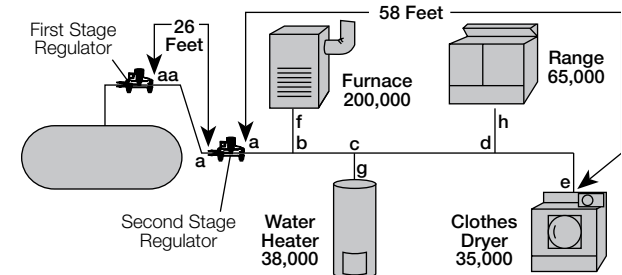
Total piping length = 84 feet (use Table 3 @ 90 feet)

From a to b, demand = 38,000 + 35,000 + 30,000
= 103,000 BTU/hr; use 3/4" pipe or 3/4" tubing
From b to c, demand = 38,000 + 35,000
= 73,000 BTU/hr; use 1/2" pipe or 5/8" tubing
From c to d, demand = 35,000 BTU/hr; use 1/2" pipe or 1/2" tubing
From c to e, demand = 38,000 BTU/hr; use 1/2" pipe or 1/2" tubing
From b to f, demand = 30,000 BTU/hr; use 1/2" pipe or 1/2" tubing



Example 2.

Determine the sizes of piping or tubing required for the two-stage LP-Gas installation shown.



Total first stage piping length = 26 feet; first stage regulator setting is 10 psig (0.69 barg) (use Table 1 or 2 @ 30 feet)

From aa to a, demand = 338,000 BTU/hr; use 1/2" pipe, 1/2" tubing, or 1/2" T plastic pipe.

Total second stage piping length = 58 feet (use Table 3 @ 60 feet)

From a to b, demand = 338,000 BTU/hr; use 1" pipe
From b to c, demand = 138,000 BTU/hr; use 3/4" pipe or 5/8" tubing
From c to d, demand = 100,000 BTU/hr; use 1/2" pipe or 5/8" tubing
From d to e, demand = 35,000 BTU/hr; use 1/2" pipe or 1/2" tubing
From b to f, demand = 200,000 BTU/hr; use 3/4" pipe
From c to g, demand = 38,000 BTU/hr; use 1/2" pipe or 1/2" tubing
From d to h, demand = 65,000 BTU/hr; use 1/2" pipe or 1/2" tubing

Pipe and Tubing Selection Guide

Example 3

Determine the sizes of piping or tubing required for the 2 PSI LP-Gas installation shown.

Total first stage piping length = 26 feet; first stage regulator setting is 10psig (use Table 1 or 2 @ 30 feet)

Total 2 PSI Piping Length = 19 ft. (use Table 4 @ 20 ft. or Table 6 @ 20 ft.)

From aa to a, demand= 338,000 BTU

use ¾" CSST or ½" copper tubing or ½" pipe

From Regulator a to each appliance:

From a to b, demand= 65,000 BTU; length = 25 ft. (Table 5),

use ½" CSST

From a to c, demand= 200,000 BTU; length = 30 ft. (Table 5)

use 1" CSST

From a to d, demand= 38,000 BTU; length = 21 ft.* (Table 5)

use ¾" CSST *use 25 ft. column

From a to e, demand= 35,000 BTU; length = 40 ft. (Table 5)

use ½" CSST

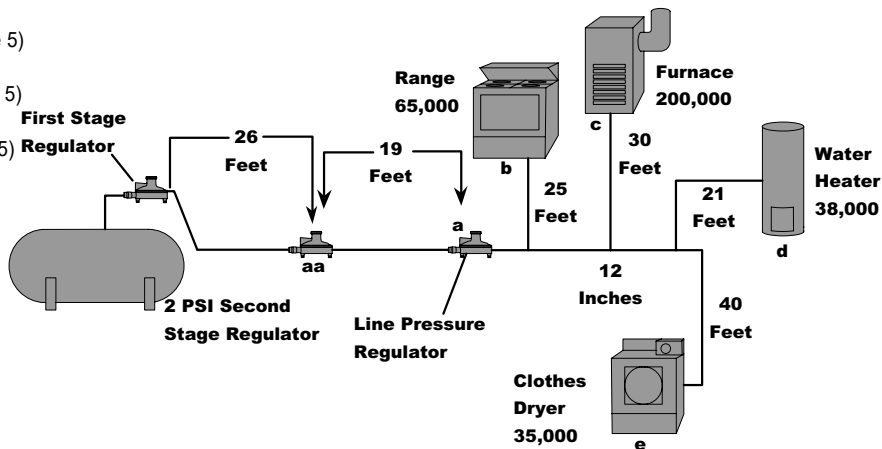


Table 1 - First Stage Tubing or Pipe Sizing * 10 PSIG Inlet with a 1 PSIG Pressure Drop (Between First and Second Stage Regulators)

Maximum capacity of pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing in Feet*																			
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	350	400	450	500
Copper Tubing (O.D.)	513	352	283	242	215	194	179	166	156	147	131	118	109	101	90	81	75	70	65	62
	1,060	727	584	500	443	401	369	343	322	304	270	244	225	209	185	168	155	144	135	127
	2,150	1,480	1,190	1,020	901	816	751	699	655	619	549	497	457	426	377	342	314	292	274	259
	3,760	2,580	2,080	1,780	1,570	1,430	1,310	1,220	1,150	1,080	959	869	799	744	659	597	549	511	480	453
Pipe Size	3,320	2,280	1,830	1,570	1,390	1,260	1,160	1,080	1,010	956	848	768	706	657	582	528	486	452	424	400
	6,950	4,780	3,840	3,280	2,910	2,640	2,430	2,260	2,120	2,000	1,770	1,610	1,480	1,370	1,220	1,100	1,020	945	886	837
	13,100	9,000	7,229	6,180	5,480	4,970	4,570	4,250	3,990	3,770	3,340	3,020	2,780	2,590	2,290	2,080	1,910	1,780	1,670	1,580
	26,900	18,500	14,800	12,700	11,300	10,200	9,380	8,730	8,190	7,730	6,850	6,210	5,710	5,320	4,710	4,270	3,930	3,650	3,430	3,240
	40,300	27,700	22,200	19,000	16,900	15,300	14,100	13,100	12,300	11,600	10,300	9,300	8,560	7,960	7,060	6,400	5,880	5,470	5,140	4,850
	77,600	53,300	42,800	36,600	32,500	29,400	27,100	25,200	23,600	22,300	19,800	17,900	16,500	15,300	13,600	12,300	11,300	10,500	9,890	9,340

* Notes: Total length of piping from outlet of first stage regulator to inlet of second stage regulator (or to inlet of second stage regulator furthest away)

1) To allow 2 PSIG pressure drop, multiply total gas demand by 0.707 and use capacities from table.

2) For different first stage pressures, multiply total gas demand by the following factor and use capacities from table.

Example: 1,000,000 BTU load at 5 PSI: 1,000,000 (1.12) = 1,120,000 BTU then use chart based on 1,120,000 BTU

First Stage Pressure PSIG	Multiply By
20	0.844
15	0.912
5	1.120

Table 2 - First Stage Polyethylene Plastic Tubing or Pipe Sizing *

10 PSIG Inlet with a 1 PSIG Pressure Drop (Between First and Second Stage Regulators)

Maximum capacity of polyethylene pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane)

(Based on 1.50 Specific Gravity Gas)

Size of Plastic Tubing or Pipe		Length of Pipe or Tubing in Feet*																			
NPS	SDR	10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400
½ T	7	N/A	N/A	762	653	578	524	482	448	421	397	352	319	294	273	256	242	230	219	202	188
½	9.33			2,140	1,840	1,630	1,470	1,360	1,260	1,180	1,120	990	897	826	778	721	681	646	617	567	528
¾				4,290	3,670	3,260	2,950	2,710	2,530	2,370	2,240	1,983	1,797	1,653	1,539	1,443	1,363	1,294	1,240	1,140	1,060
1 T				5,230	4,470	3,960	3,590	3,300	3,070	2,880	2,720	2,410	2,190	2,010	1,870	1,760	1,660	1,580	1,500	1,380	1,290
1				7,740	6,630	5,870	5,320	4,900	4,560	4,270	4,040	3,580	3,240	2,980	2,780	2,600	2,460	2,340	2,230	2,050	1,910
1 ¼				13,420	11,480	10,180	9,220	8,480	7,890	7,400	6,990	6,200	5,620	5,170	4,810	4,510	4,260	4,050	3,860	3,550	3,300
1 ½				20,300	17,300	15,400	13,900	12,800	11,900	11,200	10,600	9,360	8,480	7,800	7,260	6,810	6,430	6,110	5,830	5,360	4,990
2				36,400	31,200	27,600	25,000	23,000	21,400	20,100	19,000	16,800	15,200	14,000	13,000	12,200	11,600	11,000	10,470	9,640	8,970

* Note: Total length of piping from outlet of first stage regulator to inlet of second stage regulator (or to inlet of second stage regulator furthest away)

T = Tube Size

First Stage Pressure PSIG	Multiply By
20	0.844
15	0.912
5	1.120

Data Calculated per NFPA # 54 and NFPA # 58

In Accordance with NFPA 58 2020 & TIA20-4

Pipe and Tubing Selection Guide

Table 3 - Second Stage or Integral Twin Stage Tubing or Pipe Sizing *

11-in. Water Column Inlet with a 0.05-in. Water Column Drop

Maximum capacity of pipe or tubing in thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Pipe or Copper Tubing, Inches		Length of Pipe or Tubing in Feet*																	
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	350	400
Copper Tubing (O.D.)	¾	45	31	25	21	19	17	16	15	14	13	11	10	NA	NA	NA	NA	NA	NA
	½	93	64	51	44	39	35	32	30	28	27	24	21	20	18	16	15	14	13
	¾	188	129	104	89	79	71	66	61	57	54	48	44	40	37	33	30	28	26
	¾	329	226	182	155	138	125	115	107	100	95	84	76	70	65	58	52	48	45
Pipe Size	½	291	200	160	137	122	110	101	94	89	84	74	67	62	58	51	46	42	40
	¾	608	418	336	287	255	231	212	197	185	175	155	140	129	120	107	97	89	83
	1	1,150	787	632	541	480	434	400	372	349	330	292	265	243	227	201	182	167	156
	1¼	2,350	1,620	1,300	1,110	985	892	821	763	716	677	600	543	500	465	412	373	344	320
	1½	3,520	2,420	1,940	1,660	1,480	1,340	1,230	1,140	1,070	1,010	899	814	749	697	618	560	515	479
	2	6,790	4,660	3,750	3,210	2,840	2,570	2,370	2,200	2,070	1,950	1,730	1,570	1,440	1,340	1,190	1,080	991	922

* Note: Total length of piping from outlet of regulator to appliance furthest away.

Data Calculated per NFPA # 54 and NFPA # 58
In Accordance with NFPA 58 2020 & TIA20-2

Table 4 - Maximum Capacity of CSST *

2 PSIG and a Pressure Drop of 1 PSIG (Between 2 psig Service and Line Pressure Regulator)

In Thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size	EHD** Flow Designation	Length of Tubing in Feet*													
		10	25	30	40	50	75	80	110	150	200	250	300	400	500
¾	13	426	262	238	203	181	147	140	124	101	86	77	69	60	53
	15	558	347	316	271	243	196	189	169	137	118	105	96	82	72
½	18	927	591	540	469	420	344	333	298	245	213	191	173	151	135
	19	1,110	701	640	554	496	406	393	350	287	248	222	203	175	158
¼	23	1,740	1,120	1,030	896	806	663	643	578	477	415	373	343	298	268
	25	2,170	1,380	1,270	1,100	986	809	768	703	575	501	448	411	355	319
	30	4,100	2,560	2,330	2,010	1,790	1,460	1,410	1,260	1,020	880	785	716	616	550
1	31	4,720	2,950	2,690	2,320	2,070	1,690	1,630	1,450	1,180	1,020	910	829	716	638

* Notes:

(1) Table does not include effect of pressure drop across the line regulator. If regulator loss exceeds ½ psi (based on 13-in. water column outlet pressure).

DO NOT USE THIS TABLE. Consult with regulator manufacturer for pressure drops and capacity factors. Pressure drops across a regulator may vary with flow rate.

(2) **CAUTION:** Capacities shown in table can exceed maximum capacity for a selected regulator. Consult with regulator or tubing manufacturer for guidance.

(3) Table includes losses for four 90-degree bends and two end fittings. Tubing runs with a larger number of bends and/or fittings shall be increased by an equivalent length of tubing according to the following equation; L-1.3n where L is additional length (ft) of tubing and n is the number of additional fittings and/or bends.

**EHD - Equivalent Hydraulic Diameter - A measure of the relative hydraulic efficiency between different tubing sizes. The greater the value of EHD, the greater the gas capacity of the tubing.

Data Calculated per NFPA # 54 and NFPA # 58

Table 5 - Maximum Capacity of CSST *

11-in. Water Column and a Pressure Drop of 0.05-in. Water Column (Between Second Stage (Low Pressure) Regulator and Appliance Shutoff Valve)

In Thousands of BTU/hr of undiluted LP-Gases (Propane)

(Based on 1.50 Specific Gravity Gas)

Size	EHD** Flow Designation	Length of Tubing in Feet*																
		5	10	15	20	25	30	40	50	60	70	80	90	100	150	200	250	300
¾	13	72	50	39	34	30	28	23	20	19	17	15	15	14	11	9	8	8
	15	99	69	55	49	42	39	33	30	26	25	23	22	20	15	14	12	11
½	18	181	129	104	91	82	74	64	58	53	49	45	44	41	31	28	25	23
	19	211	150	121	106	94	87	74	66	60	57	52	50	47	36	33	30	26
¼	23	355	254	208	183	164	151	131	118	107	99	94	90	85	66	60	53	50
	25	426	303	248	216	192	177	153	137	126	117	109	102	98	75	69	61	57
	30	744	521	422	365	325	297	256	227	207	191	178	169	159	123	112	99	90
1	31	863	605	490	425	379	344	297	265	241	222	208	197	186	143	129	117	107

* Notes:

Table includes losses for four 90-degree bends and two end fittings. Tubing runs with a larger number of bends and/or fittings shall be increased by an equivalent length of tubing according to the following equation; L-1.3n where L is additional length (ft) of tubing and n is the number of additional fittings and/or bends.

**EHD - Equivalent Hydraulic Diameter - A measure of the relative hydraulic efficiency between different tubing sizes. The greater the value of EHD, the greater the gas capacity of the tubing.

Data Calculated per NFPA # 54 and NFPA # 58

Pipe and Tubing Selection Guide

Table 6 - Copper Tubing or Schedule 40 Pipe Sizing *
2 PSIG Inlet with a 1 PSIG Pressure Drop (Between 2 PSIG Service and Line Pressure Regulator)
 In Thousands of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Pipe or Copper Tubing, Inches		Length of Pipe or Tubing in Feet*																			
		10	20	30	40	50	60	70	80	90	100	150	200	250	300	350	400	450	500	600	700
Copper Tubing (O.D.)	¾	413	284	228	195	173	157	144	134	126	119	95	82	72	66	60	56	53	50	45	41
	½	852	585	470	402	356	323	297	276	259	245	197	168	149	135	124	116	109	103	93	86
	¾	1,730	1,190	956	818	725	657	605	562	528	498	400	343	304	275	253	235	221	209	189	174
	1	3,030	2,080	1,670	1,430	1,270	1,150	1,060	983	922	871	700	599	531	481	442	411	386	365	330	304
Pipe Size	½	2,680	1,840	1,480	1,260	1,120	1,010	934	869	815	770	618	529	469	425	391	364	341	322	292	269
	¾	5,590	3,850	3,090	2,640	2,340	2,120	1,950	1,820	1,700	1,610	1,290	1,110	981	889	817	760	714	674	611	562
	1	10,500	7,240	5,820	4,980	4,410	4,000	3,680	3,420	3,210	3,030	2,440	2,080	1,850	1,670	1,540	1,430	1,350	1,270	1,150	1,060
	1¼	21,600	14,900	11,900	10,200	9,060	8,210	7,550	7,020	6,590	6,230	5,000	4,280	3,790	3,440	3,160	2,940	2,760	2,610	2,360	2,170
	1½	32,400	22,300	17,900	15,300	13,600	12,300	11,300	10,500	9,880	9,330	7,490	6,410	5,680	5,150	4,740	4,410	4,130	3,910	3,540	3,260
	2	62,400	42,900	34,500	29,500	26,100	23,700	21,800	20,300	19,000	18,000	14,400	12,300	10,900	9,920	9,120	8,490	7,960	7,520	6,820	6,270

* Note: Maximum undiluted propane capacities listed are based on a 2-psig setting and a 1-psi pressure drop. Capacities in 1000 BTU/hr.
 Data Calculated per NFPA # 54 and NFPA # 58

Table 7: Second stage or Integral Twin Stage polyethylene tubing or pipe sizing*
11 in Water Column Inlet w/ a 0.5 -in Water Column Drop
 Tubing in thousand of BTU/hr of undiluted LP-Gases (Propane) (Based on 1.50 Specific Gravity Gas)

Size of Plastic Tubing or Pipe	Length of Pipe or Tubing in Feet*	Length of Pipe or Tubing in Feet*																			
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	350	400	450	500
NPS	SDR																				
1/2 T	7	121	83	67	57	51	46	42	39	37	35	31	28	26	24	21	19	18	16	15	15
1/2	9	340	233	187	160	142	129	119	110	103	98	87	78	72	67	60	54	50	46	43	41
3/4	11	680	486	375	321	285	258	237	221	207	196	173	157	145	135	119	108	99	92	87	82
1 T	11	828	569	457	391	347	314	289	269	252	238	211	191	176	164	145	132	121	113	106	100
1	11	1,230	844	677	580	514	466	428	398	374	353	313	284	261	243	215	195	179	167	157	148
1 1/4	11	2,130	1,460	1,170	1,000	890	807	742	690	648	612	542	491	452	420	373	338	311	289	271	256
1 1/2	11	3,210	2,210	1,770	1,520	1,340	1,220	1,120	1,040	978	924	819	742	683	635	563	510	469	436	409	387
2	11	5,770	3,970	3,180	2,730	2,420	2,190	2,010	1,870	1,760	1,660	1,470	1,330	1,230	1,140	1,010	916	843	784	736	695

*Note: Total length of piping from the outlet of regulator to appliance furthest away. Data Calculated per NFPA #58 & NFPA #54 T = Tube Size

RegO Regulator Designs

RegO LP-Gas Regulators have been designed to give outstanding performance and dependability with a minimum of maintenance.

Nozzle Orifice

Replaceable and precision machined to prevent scoring of the seat disc.

Seat Disc

Replaceable, resilient construction gives sure closing at lock up pressure. Straight line seat disc to nozzle operation provides even seat disc wear and positive lock up.

Pivot Pin

Fully enclosed in regulator body.

Control Linkage

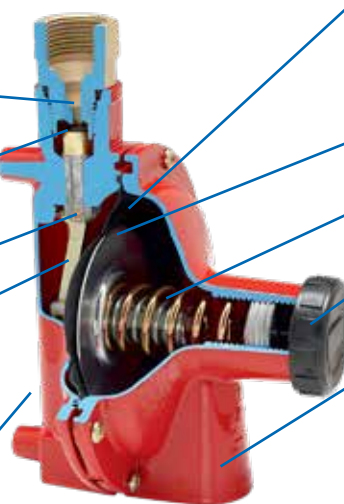
Provides quick response to diaphragm movement; moves directly perpendicular to nozzle orifice to meter gas flow, gives positive closure and reduces seat disc wear.

Built-In Pressure Tap

Provides a convenient way to check downstream pressure on both high and low pressure models.

Body & Bonnet

Painted, heavy-duty zinc resists corrosion and gives long-life protection, even under "salty air" conditions.



Molded Diaphragm Assembly

Molded synthetic rubber with a tough, flexible fabric gives a super sensitive response in a temperature range of -40° to +165°F. Molded diaphragm seals in a groove between the body and bonnet.

Diaphragm Plate

Rigid diaphragm plate transmits pressure variations to control linkage.

Relief Valve

It is built in and tamper resistant. Large bonnet vent allows high capacity relief on second stage regulators.

Bonnet Cap

Bonnet cap incorporates travel stop to help control downstream pressure in the unlikely event of a regulator malfunction.

Large Bonnet Vent

Large vent is equipped with protective screen and threaded for 1/4" F. NPT vent piping. Large vent helps prevent ice from building up and blocking the vent during inclement weather. The regulator should be installed with vent down and the vent protected against blockage.



Laser Engraved Bonnet

New bonnet design features laser- engraved information that is easy to see and matches available stickers for gas check and record keeping. *Patent Pending

Easy to Turn Adjusting Screw

We redesigned our adjusting screw to be easily turned.

1/8" pressure plug ports

Our 1/8" pressure plug ports conform to 7/16" hex wrenches.

Typical of the 1580 Industrial High Pressure Regulators

The pounds-to-pounds, industrial regulator gives higher delivery pressure as tank pressure decreases, thus permitting full use of the gas in the tank. Most units are field adjustable to meet changing conditions.

Connections

Machined and threaded into the body forging; also includes 1/4" NPT pressure gauge ports.

Seat Disc

Synthetic rubber assembly attached directly to the diaphragm assembly to ensure proper movement and regulation.

Back Cap Spring

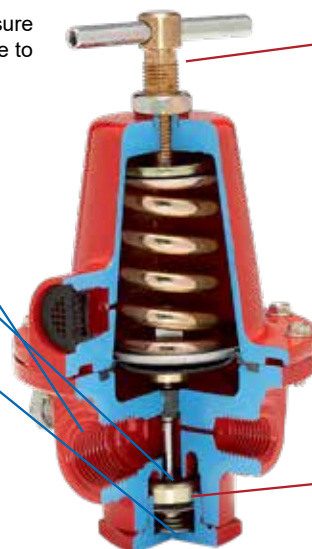
Provides added upward force to help provide a positive lock-up.

Sensitivity

In those cases where there is a choice of delivery pressure ranges, the **lowest** spring range which will fulfill your requirements is recommended because the sensitivity of a regulator decreases as the range of the adjusting spring increases.

Relief Valves

Most high pressure regulators are not equipped with integral relief valves. For certain applications where it is desirable to protect equipment downstream of the regulator, relief valves must be installed in the line.



Adjusting Assembly

Large handle with lock-nut release allows easy resetting of delivery pressure.

Integral O-Ring

Minimizes tendency to vibrate or hum under extreme loads.

RegO Regulator Coding Guide

Regulator Coding	
LV404, 7525, LV3403, LV4403, LV5503 Series	
LV	Large Vent
B	Brown (2nd Stage or Twin Stage)
B	11" w.c. (27.37 MBars)
BD	Dielectric Inlet
Y	2 PSI (0.14 barg) Outlet Pressure
R	Integral Relief Valve
R	Red (1st Stage or High Pressure)
R	Rear Outlet
RA	Right Angle
RAB	Right Angle with Bracket
S	5 PSI (0.34 barg) Outlet Pressure
T	10 PSI (0.69 barg) Outlet Pressure
U	15 PSI (1.03BARG) Outlet Pressure
V	20 PSI (1.38 barg) Outlet Pressure
VI	Vent Over Inlet
VO	Vent Over Outlet
V3	Vent at 3:00 O'clock Position
V9	Vent at 9:00 O'clock Position
Inlet / Outlet Connection Sizing	
2	¼" F. NPT
3	⅜" F.NPT
4	½" F. NPT
6	¾ F. NPT
8	1" F. NPT
9	F. POL
14	1½" F. NPT
16	2" F. NPT

Example 1

LV4403TR9 – Red color = first stage Regulator
 "LV" = large vent
 "4403" is the model series
 "T" = 10 PSI outlet
 "R" = Integral internal relief valve
 "9" = F.POL inlet



Example 2

LV4403B46R - Brown color = second stage regulator
 "LV" = large vent
 "4403" = model series
 "B" = 11" water column outlet pressure
 "4" = ½" F.NPT inlet
 "6" = ¾" F.NPT outlet
 "R" = rear outlet



Example 3

LV5503Y6 - Blue color = two pound regulator
 "LV" = large vent
 "5503" = model series
 "Y" = two pound outlet pressure
 "6" = ¾" F.NPT inlet and outlet pipe size
 "8" = 1" F. NPT

LV5503Y8 has a ¾" F.NPT inlet and a 1" F.NPT outlet



RegO Regulator Selection

Type of System		Maximum Load	Suggested Regulator
	First Stage in a Two Stage System	1,500,000	LV3403TR
		2,500,000	LV4403SR Series LV4403TR Series
	Second Stage in a Two Stage System	450,000	LV3403B Series
			LV3403BR Series
		935,000	LV4403B Series
			LV4403BD Series
		1,600,000	LV5503B4/B6
	Second Stage in a 2 psig (0.14 barg) System	2,300,000	LV5503B8
		1,000,000	LV4403Y4/Y46R
		2,200,000	LV5503Y6/Y8
	Integral Twin Stage	450,000	LV404B34/39 Series
		525,000	LV404B4/B9 Series
	Integral Twin Stage 2 psig (0.14 barg) Delivery	800,000	LV404Y9
		650,000	LV404Y39
	Automatic Changeover	400,000	7525B34 Series
		450,000	7525B4 Series

Compact regulator with POL LV3403TR9

Ideal for use as a first stage regulator on any domestic size ASME or DOT container in propane gas installations requiring up to 1,500,000 BTU's per hour. The regulator is factory set to reduce container pressure to an intermediate pressure of approximately 10 psig (0.69 barg).



LV3403TR9

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Bonnet Vent Position	Vapor Capacity BTU/hr Propane*
LV3403TR9	1/4" F.NPT	1/2" F.NPT	7/32"	10 psig	0.69 barg	Over Outlet	1,500,000

* Maximum flow based on inlet pressure 20 psig (1.38 barg) higher than the regulator setting and delivery pressure 20% lower than the regulator setting and delivery pressure 20% lower than the setting.

Compact First Stage Regulators LV3403TR

Ideal for use as a first stage regulator on any domestic size ASME or DOT container in propane gas installations requiring up to 1,500,000 BTU's per hour. The regulator is factory set to reduce container pressure to an intermediate pressure of approximately 10 psig (0.69 barg).



LV3403TR

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Bonnet Vent Position	Vapor Capacity BTU/hr Propane*
LV3403TR	1/4" F.NPT	1/2" F.NPT	7/32"	10 psig	0.69 barg	Over Outlet	1,500,000
LV3403TRV9						9:00	

* Maximum flow based on inlet pressure 20 psig (1.38 barg) higher than the regulator setting and delivery pressure 20% lower than the regulator setting and delivery pressure 20% lower than the setting.

High Pressure First Stage Regulators LV4403SR and TR Series

Provides accurate first stage regulation in two-stage bulk tank systems. Reduce tank pressure to an intermediate pressure of 5 to 10 psig (0.34 to 0.69 barg). Also used to supply high pressure burners for applications like industrial furnaces or boilers. Also incorporated in multiple cylinder installations.



LV4403 Series

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range* (psig)	Adjustment Range* (barg)	Integral Relief Included	Vapor Capacity BTU/hr Propane
LV4403SR4	1/2" F. NPT F. POL	1/2" F. NPT	1/4"	5	1-5	0.07-0.34	Yes	2,500,000
LV4403TR4				10	5-10	0.34-0.69		
LV4403SR9				5	1-5	0.07-0.34		
LV4403TR9				10	5-10	0.34-0.69		
LV4403SR96		3/4" F.NPT		5	1-5	0.07-0.34		
LV4403TR96				10	5-10	0.34-0.69		

* When used for final stage pressure control, must either incorporate integral relief valve or separate relief valve should be specified in accordance with NFPA Pamphlet 58.

** Maximum flow based on inlet pressure 20 psig (1.38 barg) higher than the regulator setting and delivery pressure 20% lower than the setting.

Low Pressure Second Stage Regulators - Standard Settings LV4403B Series

Designed to reduce first stage pressure of 5 to 20 psig (0.34 to 1.38 barg) down to burner pressure, normally 11" w.c. (27.37 MBars) Ideal for medium commercial installations, multiple cylinder installations and normal domestic loads.



LV4403B Series

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane**
LV4403B4	½" F. NPT	½"	#28 Drill	11" w.c. (27.37 MBars) at 10 psig Inlet	11" w.c. (27.37 MBars)at 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	935,000
LV4403B46		¾" F. NPT						
LV4403B46R*								
LV4403B66	¾" F. NPT							
LV4403B66R*								

* Backmount design

** Maximum flow based on 10 psig (0.69 barg) inlet and 9" w.c. (22.4 MBars) delivery pressure.

Dielectric Second Stage Regulators LV4403BD Series

RegO's Dielectric second stage regulators are designed to reduce first stage pressure normally 10PSIG (0.69 barg) down to burner pressure, normally 11" w.c. (27.37 MBars) and are ideal for medium commercial installations, multiple cylinders installations and normal domestic loads.

RegO Dielectric second stage regulators are engineered to isolate potential electrical current from metallic piping before entering a building. The use of a separate dielectric union is not necessary because the regulator contains a dielectric union as part of the inlet assembly. Available in both SAE Flare and F.NPT inlet connection.

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Inlet Material	Orifice Size	Factory Delivery Pressure	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr Propane
¾" M. Flare = 3									
LV4403B3D	¾" M Flare	½" F. NPT		# 28 Drill	11" w.c. (27.37 MBars)at 10 psig Inlet	11" w.c. (27.37 MBars)at 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	935,000
LV4403B36D		¾" F. NPT							
LV4403B3RD*		½" F. NPT							
LV4403B36RAD**		¾" F. NPT							
LV4403B36RABD***									1,000,000
½" M. Flare = 1									
LV4403B1D	½" M Flare	½" F. NPT	Brass	# 28 Drill	11" w.c. (27.37 MBars)at 10 psig Inlet	11" w.c. (27.37 MBars)at 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	935,000
LV4403B16D		¾" F. NPT							
LV4403B16RD*									
LV4403B16RAD**									
LV4403B16RABD***									1,000,000
¾" M. Flare = 5									
LV4403B5D	¾" M Flare	½" F. NPT	Brass	# 28 Drill	11" w.c. (27.37 MBars)at 10 psig Inlet	11" w.c. (27.37 MBars)at 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	935,000
LV4403B56D		¾" F. NPT							
LV4403B56RD*									
LV4403B56RAD**									
LV4403B56RABD***									1,000,000
½" - ¾" F. NPT	Female Union								
LV4403B4D	½" F. NPT	¾" F. NPT	Brass & Plated Steel	# 28 Drill	11" w.c. (27.37 MBars)at 10 psig Inlet	11" w.c. (27.37 MBars)at 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	935,000
LV4403B46D									
LV4403B66D	¾" F. NPT								
LV4403B46RD*	½" F. NPT								
LV4403B66RD*	¾" F. NPT			¾" F. NPT					
LV4403B66RAD**									
LV4403B66RABD***									

* Backmount Design.

** Right Angle Design

***Right Angle with Bracket

Maximum flow based on 10 psig (0.69 barg) inlet and 9" w.c. (22.4 MBars) delivery pressure.



LV4403BD Series

Low Pressure Second Stage Regulators - Special Settings LV4403H Series

Designed to reduce first stage pressure of 5 to 10 psig (0.34 to 0.69 barg) down to pressure higher than 11" water column (27.37 MBar), the actual pressure setting is specified in the table below. These regulators are designed for installations where the appliances require pressures greater than 11 inches w.c. (27.37 MBar)

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Delivery Pressure at 10 psig (0.69 barg) Inlet	Adjustment Range Inches w.c.	Adjustment Range Millibars	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane**
LV4403H222	¼" F.NPT	½" F.NPT	#28	22" w.c. (54.74 MBar)	15-35	37.32-87.94	Inlet	700,000
LV4403H414	½" F.NPT			14" w.c. (34.84 MBar)	12.5-19	31.12-47.28		
LV4403H420				20" w.c. (49.77 MBar)	15-35	37.32-87.94		
LV4403H4614		14" w.c. (34.84 MBar)		12.5-19	31.12-47.28			
LV4403H4620		20" w.c. (49.77 MBar)		15-35	37.32-87.94			
LV4403H6614		¾" F.NPT		14" w.c. (34.84 MBar)	12.5-19	31.12-47.28		

* Maximum flow based on 10 psig (0.69 barg) inlet 20% drop in delivery pressure (5/1/08)

100 RegO Dr. Elon, NC 27244 USA www.regoproducts.com +1 (336) 449-7707



LV4403H Series

Compact "Back-Mount" Regulator LV3403BR Series

The LV3403BR Back Mount Regulator is designed to reduce first stage pressure of 5-10 psig (0.34-0.69 barg) down to burner pressure normally 11" w.c. (27.37 MBars) Designed as a second stage regulator for smaller applications with flow requirements up to 450,000 BTU/hr. and are ideal for homes, mobile homes, and cottages.



LV3403BR Series

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr *
LV3403B44R	1/2" F.NPT	1/2" F.NPT	7/32"	11" w.c. (27.37 MBars) At 10 psig Inlet	11" w.c. (27.37 MBars) At 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	450,000
LV3403B46R		3/4" F.NPT						

* Maximum flow based on 10 psig (0.69 barg) inlet and 9" w.c. (22.4 MBars) delivery pressure.

Compact Second Stage Regulator for LP-Gas LV3403B4

The LV3403B4 is designed to reduce first stage pressure of 5-20 psig (0.34 to 1.38 barg) down to burner pressure normally 11" w.c. (27.37 MBars) Designed as a second stage regulator for smaller applications with flow requirements up to 450,000 BTU's/hr, they are ideal for homes, mobile homes, and cottages.



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr *
LV3403B4	1/2" F.NPT	1/2" F.NPT	7/32"	11" w.c. (27.37 MBars) At 10 psig Inlet	11" w.c. (27.37 MBars) At 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Inlet	450,000
LV3403B4V3							3:00	
LV3403B4V0							Outlet	
LV3403B4V9							9:00	

* Maximum flow based on 10 psig (0.69 barg) Inlet 9" w.c. (22.4 MBars) delivery pressure

Low Pressure Second Stage Regulators LV4403B66RA Series

Designed to reduce first stage pressure of 5 to 20 psig (0.34 to 1.38 barg) down to burner pressure, normally 11" w.c. (27.37 MBars) Ideal for medium commercial installations, vapor meter installations and normal domestic loads.



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV4403B66RA	3/4" F. NPT	3/4" F. NPT	3/16"	11" w.c. (27.37 MBars) at 10 psig Inlet	11" w.c. (27.37 MBars) at 0.69 barg Inlet	9" to 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	1,000,000
LV4403B66RAB**								

* Maximum flow is based on 10 psig (0.69 barg) inlet and 9" w.c. (22.4 MBars) delivery pressure.

** Mounting Bracket Included.



LV4403B66RA Series

Low Pressure Second Stage Regulators - Standard Settings LV5503B Series

Designed to reduce first stage pressure of 5 to 20 psig (0.34 to 1.38 barg) down to burner pressure, normally 11" w.c. (27.37 MBars) Ideal for larger commercial and industrial applications, multiple cylinder installations and large domestic systems.



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane
LV5503B4	½" F. NPT	¾" F. NPT	¼"	11" w.c. (27.37 MBars) at 10 psig Inlet	11" w.c. (27.37 MBars) at 0.69 barg Inlet	9" - 13" w.c. (22.4 to 32.35 MBars)	Over Inlet	1,600,000
LV5503B6	¾" F. NPT							
LV5503B8								

Maximum flow is based on 10 psig (0.69 barg) inlet and 9" w.c. (22.4 MBars) delivery pressure.



LV5503B Series

Low Pressure Second Stage Regulators - Special Settings LV5503H Series

Designed to reduce first stage pressure of 5 to 20 psig (0.34 to 1.38 barg) down to burner pressure, normally 11" w.c. (27.37 MBar) Ideal for larger commercial and industrial applications, multiple cylinder installations and large domestic systems.



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure @ 10 psig (0.69 barg) Inlet	Adjustment Range Inches w.c.	Adjustment Range MiliBars	Bonnet Vent Position	Vapor Capacity BTU/hr.* Propane
LV5503H414	1/2" F. NPT	3/4" F. NPT	1/4"	14" w.c. (34.84 MBars)	7-16	17.42-39.81	Inlet	1,600,000
LV5503H614				20" w.c. (49.77 MBars)	11-28	27.37-69.68	Outlet	
LV5503H620				40" w.c. (99.54 MBars)	28-84	69.68-209.03	Inlet	
LV5503H620V							Outlet	
LV5503H640								
LV5503H640V								
LV5503H814	3/4" F. NPT	1" F. NPT	9/32"	14" w.c. (34.84 MBars)	7-16	17.42-39.81	Inlet	2,300,000
LV5503H820				20" w.c. (49.77 MBars)	11-28	27.37-69.68		
LV5503H840				40" w.c. (99.54 MBars)	28-84	69.68-209.03		

Maximum flow is based on 10 psig (0.69 barg) inlet 20% drop in delivery pressure (5/1/08)



LV5503H Series

Second Stage Regulators for 2 PSI Systems LV4403Y and LV5503Y Series

Designed to reduce first stage pressure of 10 psig (0.69 barg) down to 2 psig (0.14 barg). A line pressure regulator is required downstream to reduce the 2 psig (0.14 barg) to a nominal 11" w.c. (27.37 MBars)



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Delivery Pressure (psig)	Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane***
LV4403Y4	1/2" F. NPT	1/2" F. NPT	1/4"	2 psig @ 10 psig Inlet	2 psig @ 0.69 barg Inlet	1.6 -2.2 PSI	Over Inlet	1,000,000
LV4403Y46R*		3/4" F. NPT						2,200,000
LV5503Y6		1" F. NPT						
LV5503Y8	3/4" F. NPT	1" F. NPT	9/32"					

Maximum flow is based on 10 psig (0.69 barg) inlet pressure and 1.5 psig (0.10 barg) delivery pressure.



LV5503Y Series

LV4403Y Series

Low Pressure Second Stage Tobacco Barn Regulator LV5503G4 Series

Especially developed for drying barns in the tobacco industry. The LV5503G4 regulator will supply a steady and constant flow of fuel to as many as 12 to 20 burners throughout the barn.



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV5503G4	1/2" F. NPT	3/4" F. NPT	1/4"	15" w.c. (37.33 MBars) at 15 psig Inlet	15" w.c. (37.33 MBars) at 1.03 barg Inlet	8" - 18" w.c. (19.91-44.79 MBars)	Above Inlet	1,750,000

Maximum flow is based on 15 psig (1.03 barg) inlet pressure and 13" w.c. (32.35 MBars) delivery pressure.



LV5503G4 Series

Compact Twin Stage Regulators LV404B4 and LV404B9 Series

This compact two-stage regulator is designed to reduce container pressure down to 11" w.c. (27.37 MBars) delivery pressure. It is ideal for "on-site" cylinder applications, mobile homes and average domestic service including small ASME and 100 to 420 pound DOT cylinders.



404PE



LV404B4



LV404B4V9



LV404B9

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range 2nd Stage	Bonnet Vent Position 1st Stage	Bonnet Vent Position 2nd Stage	Capacity BTU/hr. Propane*	Accessories						
										1st Stage Vent Pipe-Away						
LV404B4	¼" F. NPT	½" F. NPT	3/16"	11" w.c. (27.37 MBars) at 100 psig Inlet	11" w.c. (27.37 MBars) at 6.89 barg Inlet	9" - 13" w.c. (22.4- 32.35 MBars)	Down	Over Outlet	525,000	404PE						
LV404B4V9		¾" F. NPT					9 o'clock	9 o'clock								
LV404B46							Down	Over Outlet								
LV404B46V9		9 o'clock					9 o'clock									
LV404B9	F. POL	½" F. NPT					3/16"	11" w.c. (27.37 MBars) at 100 psig Inlet			11" w.c. (27.37 MBars) at 6.89 barg Inlet	9" - 13" w.c. (22.4- 32.35 MBars)	Down	Over Outlet	525,000	404PE
LV404B9V9		¾" F. NPT											9 o'clock	9 o'clock		
LV404B96													Down	Over Outlet		
LV404B96V9		9 o'clock											9 o'clock			

Maximum flow is based on 25 psig (1.72 barg) inlet pressure and 9" w.c. (22.4 MBars) delivery pressure.

New Compact Twin Stage Regulators for LP-Gas LV404B34 & LV404B39 Series

The compact twin-stage regulator is designed to reduce container pressure down to 11" w.c. (27.37 MBars) delivery pressure. It is ideal for "on site" container applications such as homes, mobile homes and cottages for average domestic service; including small ASME tanks and 100-420 pound DOT cylinders.



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range 2nd Stage	Bonnet Vent Position 1st stage **	Bonnet Vent Position 2nd stage**	Vapor Capacity BTU/hr *	
LV404B34	¼" F.NPT	½" F.NPT	7/32"	11" w.c. (27.37 MBars) @ 100 Psig Inlet	11" w.c. (27.37 MBars) @ 6.89 barg Inlet	9" to 13"w.c.(22.4-32.35 MBars)	Rear	Outlet	450,000	
LV404B39	F.POL						Left	9:00		
LV404B34V9	¼" F.NPT									
LV404B39V9	F.POL									

* Maximum flow based on 10 psig (0.69 barg) Inlet 9" w.c. (22.4 MBars) delivery pressure

** Other vent positions available upon request



LV404B39



LV404B34

Twin Stage Automatic Changeover Regulators 7525B Series

These combination automatic changeover, two stage regulators are especially suitable for homes, mobile homes, cottages, construction and other portable two cylinder installations. Empty containers may be replaced without interrupting customer's gas service.



Ordering Information

Automatic Changeover Regulator	Inlet	Outlet	Pigtails	Bracket	Capacity BTU/hr. Propane
7525B34	1/4" Inverted Flare	1/2" F. NPT	912FA20	2302-31	400,000
7525B34			912FS20		
7525B4			912FA20	2503-22	450,000
7525B4			912FS20		

Maximum flow is based on 25 psig (1.72 barg) inlet pressure and 9" w.c. (22.4 MBars) delivery pressure.



7525B34



7525B4

Two psig Delivery Pressure Twin-Stage Regulators LV404Y9 & Compact LV404Y39

SPECIAL 2 psig (0.14 barg) DELIVERY pressure twin stage regulator is designed to reduce container pressure down to 2 psig (0.14 barg). A line pressure regulator is required downstream to reduce the 2 psig (0.14 barg) to a nominal 11" w.c. (27.37 MBar)



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Adjustment Range (psig)	Bonnet Vent Position 1st Stage	2 psig Bonnet Vent Position	Capacity BTU/HR*
LV404Y9	F.POL (CGA 510)	½" F.NPT	7/32"	2	1.8 to 2.5	Down	Outlet	800,000
LV404Y39								650,000

Maximum flow is based on 25 psig (1.72 barg) inlet pressure and 1.5 psig (0.07 barg) delivery pressure.



LV404Y39

LV404Y9

Two Stage Regulator Outfits 5807, 5808, 5820 Series

These outfits contain the equipment required to provide two-stage regulation.

Ordering Information

Kit Number	1st Stage Regulator Included		2nd Stage Regulator Included		Bracket Included	Pigtail Included	Capacity BTU/hr. Propane
	Part Number	Inlet x Outlet Female	Part Number	Inlet x Outlet F. NPT			
5807	LV4403TR9	POL x ½" NPT	LV4403B4	½" x ½"	2503-22	913PS12	935,000
5808			LV4403B46R	½" x ¾"	Not Required		
5820	LV4403TR96	POL x ¾" NPT	LV4403B66R	¾" x ¾"			



913PS12

2503-22



LV4403TR9

LV4403B Series

Twin Stage Regulator Outfits 5828 and 5832

This outfit contains the equipment required to provide twin-stage regulation.

Ordering Information

Kit Number	Twin Stage Regulator Included	Inlet F. NPT	Outlet F. NPT	Pigtails Included	Capacity BTU / hr. Propane
5828	LV404B4	¼"	½"	912JS12	525,000
5832	LV404B34V9				400,000



912JS12

2503-22



LV404B4

LV404B34V9

Automatic Changeover Regulator Outfits

5726B34, 5727B34, 5754B4, 5755B4

This outfit contains the equipment required to provide twin-stage regulation.



Ordering Information

Kit Number	Automatic Changeover Regulator Included	Inlet	Outlet	Pigtails Included-2	Bracket Included	Capacity BTU/hr. Propane
5726B34	7525B34	1/4" Inverted Flare	1/2" F. NPT	912FA20	2302-31	400,000
5727B34	7525B34			912FS20		
5754B4	7525B4			912FA20	2503-22	450,000
5755B4	7525B4			912FS20		



912FA20



7525B4

Compact Regulators 302 Series

These compact regulators are designed for smaller outdoor grills and fish cookers. It is intended for use on small portable appliances that use 100,000 BTU's/hr. or less. It may not be used on fixed pipe systems per NFPA 58, 1995 edition.



Ordering Information

Part Number	Type	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure (psig)	Factory Delivery Pressure (barg)	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
302	Single Stage	1/4" F. NPT	3/8" F. NPT	No. 50 Drill	11" w.c. (27.37 MBars) at 100 psig inlet	11" w.c. (27.37 MBars) at 6.89 barg inlet	9-13" w.c. (22.4-32.35 MBars)	Small Vent Above Inlet	125,000
302V		1/4" F. NPT						Drip Lip Above Inlet	
302V9		1/4" F. NPT						Drip Lip at 9 o'clock	
302V9LS		Soft POL w/o orifice							

Maximum flow is based on 25 psig (1.72 barg) inlet pressure and 9" w.c. (22.4 MBars) delivery pressure.



302



302V

High Pressure Industrial / Commercial Pounds-to-Pounds Regulators

597F Series

Designed to reduce propane gas container pressure down to between 3 and 100 psig (0.21 and 6.89 barg). Ideal for liquid or vapor service, they can be used in a variety of applications including salamander heaters, weed burning torches, fish cookers, tar pot heaters, and other industrial type services.



Ordering Information

Part Number	Adjustment Method	Inlet Connection	Outlet Connection	Recommended Delivery Pressure Range (psig)	Recommended Delivery Pressure Range (barg)	Capacity Determined at Set Pressure of psig*	Capacity BTU/hr. Propane**
597FA	Tee Handle	1/4" NPT	1/4" NPT	1-15	0.07-1.03	10	1,750,000
597FB				10-30	0.69-2.07	20	3,000,000
597FC				20-45	1.38-3.10	30	3,500,000
597FD				40-100	2.76-6.89	40	4,500,000

* Set pressure established at 100 psig (6.89 barg) inlet and a flow of 250,000 BTU/hr.

** Capacity determined at actual delivery pressure 20% less than set pressure with inlet pressure 20 psig (1.38 barg) higher than the set pressure.



597F

High Pressure Industrial / Commercial Pounds-to-Pounds Regulators 1580V and AA1580V Series

Designed to reduce LP-Gas and anhydrous ammonia container pressures to between 3 and 125 psig (0.21 and 8.62 barg). Precision-built with a multi-million BTU capacity, the 1580V series is perfect for such big, tough jobs as crop dryers, asphalt batch mixing plants, road building "tar wagons", heat treating and other large industrial and commercial loads. It's also ideal as a first stage regulator in large multiple operations. The AA1580V series is ideal for use in anhydrous ammonia applications such as blue print machines and heat treating.



1580V

Ordering Information

Part Number	Service	Adjustment Method	Inlet & Outlet Connections	Recommended Delivery Pressure Range (psig)	Recommended Delivery Pressure Range (barg)	A Width	B Height (max.)	Capacity Determined at Set Pressure of psig*	Capacity**
1584VN	LP-Gas	Tee Handle	½" F. NPT	3-30	0.21-2.07	2 15/16"	4 7/8"	20	7,000,000 BTU/hr. LPG
1584VL				25-50	1.72-3.45			30	10,000,000 BTU/hr. LPG
1584VH				45-125	3.10-8.62			60	10,000,000 BTU/hr. LPG
AA1584VW	NH3			3-25	0.21-1.72			20	4,500 CFH NH3
AA1584VL				20-50	1.38-3.45			30	4,800 CFH NH3
AA1584VH				45-125	3.10-8.62			60	5,100 CFH NH3
1586VN	LP-Gas		¾" F. NPT	3-30	0.21-2.07	3 ½"	7"	20	7,500,000 BTU/hr. LPG
1586VL				25-50	1.72-3.45			30	14,000,000 BTU/hr. LPG
1586VH				45-125	3.10-8.62			60	14,000,000 BTU/hr. LPG
AA1586VW	NH3			3-25	0.21-1.72			20	7,700 CFH NH3
AA1586VL				20-50	1.38-3.45			30	
AA1586VH				45-125	3.10-8.62			60	
1588VN	LP-Gas	1" F. NPT	3-30	0.21-2.07			20	7,500,000 BTU/hr. LPG	
1588VL			25-50	1.72-3.45			30	14,000,000 BTU/hr. LPG	
1588VH			45-125	3.10-8.62			60	14,000,000 BTU/hr. LPG	

* Set pressure is established with 100 psig (6.89 barg) inlet pressure and a flow of 500,000 BTU/hr. propane for 1580V Series, and 180 CFH/hr. NH₃ for AA1584V and AA1586V Series.

** Capacity determined at 100 psig (6.89 barg) inlet, set pressure noted on chart at 20% drop.

NOTE: Care must be taken to prevent re-liquefaction of propane at normal temperatures by heat tracing or other effective means. Use of a relief valve upstream or downstream of these regulators is recommended in accordance with NFPA 58.

A

High Pressure / High Temperature Industrial / Commercial Pounds-to-Pounds Regulators X1584V, X1586V, and X1588V Series

Designed to reduce LP-Gas container pressures to between 3 and 50 psig (0.21 and 3.45 barg). Ideal for crop drying, heat treating, asphalt batch mixing and other large industrial and commercial load application utilizing high temperature LP-Gas or high temperature atmosphere under conditions up to 300°F. Also ideal as a first stage regulator in large multiple operations.



X1584

Ordering Information

Part Number	Service	Adjustment Method	Width	Height	Inlet & Outlet Connections	Recommended Delivery Pressure Range (psig)	Recommended Delivery Pressure Range (barg)	Capacity Determined at Set Pressure of psig*	Capacity BTU/hr. Propane**
X1584VN	LP-Gas	Tee Handle	2 7/8"	8 7/8"	½" F. NPT	3-30	0.21-2.07	20	7,000,000
X1584VL						25-50	1.72-3.45	30	10,000,000
X1586VN			3 5/16"	6 7/8"	¾" F. NPT	3-30	0.21-2.07	20	7,500,000
X1586VL						25-50	1.72-3.45	30	14,000,000
X1588VN					1" F. NPT	3-30	0.21-2.07	20	7,500,000
X1588VL						25-50	1.72-3.45	30	14,000,000

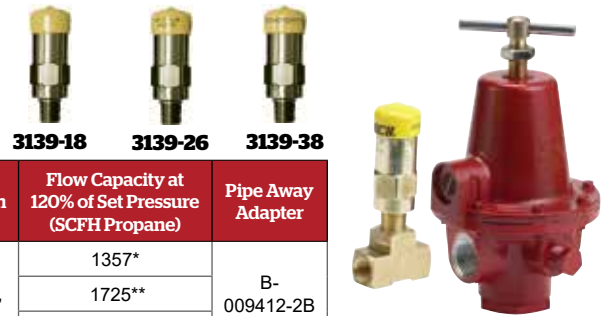
* Set pressure is established with 100 psig (6.89 barg) inlet pressure and a flow of 500,000 BTU/hr. propane.

** Capacity determined at 100 psig (6.89 barg) inlet, set pressure noted on chart at 20% drop.

NOTE: Care must be taken to prevent re-liquefaction of propane at normal temperatures by heat tracing or other effective means. Use of a relief valve upstream or downstream of these regulators is recommended in accordance with NFPA 58.

Vapor Relief Valves 3139 Series

Designed for use as a relief valve on high pressure regulators to comply with NFPA 58 5.1.1 "High-pressure regulators with a rated capacity of more than 500,000 BTU/hr where permitted to be used on two stage systems shall incorporate an integral relief valve or shall have a separate relief valve."



3139-18 3139-26 3139-38

Part Number	Set Pressure	Set Pressure	Regulator Settings	Regulator Settings	Connection Size	Height	Width	Flow Capacity at 120% of Set Pressure (SCFH Propane)	Pipe Away Adapter
3139-18	18 psig	1.24 barg	10 psig	0.69 barg	¼" M. NPT	2 27/32"	1 1/16"	1357*	B-009412-2B
3139-26	26 psig	1.79 barg	15 psig	1.03 barg				1725**	
3139-38	38 psig	2.62 barg	20 psig	1.38 barg				2304***	

* Flow recorded at 21.6 PSI (1.49 barg) inlet pressure for this valve. ** Flow recorded at 31.2 PSI (2.15 barg) inlet pressure for this valve. *** Flow recorded at 45.6 PSI (3.14 barg) inlet pressure for this valve.

Copper Pigtails 912 and 913 Series

Straight Pigtails Ordering Information

Connections	Approximate Length	Part Number		
		¼" Tube		¾" Tube
		¾" Hex Short Nipple	1½" Hex Long Nipple	¾" Hex Short Nipple
M.POL x M.POL	5"	-	½"	913JS05
	12"	912PS12	-	913PS12
	20"	912PS20	912PA20	913PS20
	30"	912PS30	-	913PS30
	36"	912PS36	912PA36	913PS36
¼" Inverted Flare x M.POL	48"	912PS48	912PA48	913PS48
	12"	912FS12	-	-
	20"	912FS20	912FA20	-
	30"	912FS30	-	-
¼" M.NPT x M.POL	36"	912FS36	-	-
	5"	-	-	913JS05
	12"	912JS12	-	-
	20"	912JS20	-	-
½" M.NPT x M.POL	36"	912JS36	-	-
	12"	-	-	913LS12
½" M.NPT x ¾" M.NPT	12"	-	-	913KL12

Pigtails are available in a variety of connections, sizes and styles. Care should always be taken in selecting the proper pigtail for a particular application.

Note: RegO recommends a new pigtail be installed with every new and replaced regulator.



913PS12

Dielectric Pigtails



D912

Part Number	Approximate Length	Tube	Connections
D912P12	12"	¼"	M.POL x M.POL
D912P20	20"		
D912P30	30"		
D912J12	12"		
D912J20	20"	¾"	¼" M.NPT x M.POL
D912J30	30"		
D913P12	12"		
D913P20	20"	¾"	M.POL x M.POL
D913P30	30"		
D913P36	36"		
D913P48	48"		

Bent Pigtails Ordering Information

Connections	Approximate Length	Part Number	Type/Degree of Bend
		¾" Tube	
		¾" Hex Short Nipple	
¼" M. NPT x M. POL	5"	913JS05A	90°
M. POL x M. POL		913PS05A	
	12"	913PS12G	270° Right Hand
		913PS12H	270° Left Hand
		913PS12S	360°

Inlet Fittings

Part Number	Description
970	Hard nose POL with wrench nut.
970AX	Hard nose POL with wrench nut and excess flow.
970AXS	Soft nose POL with wrench nut and excess flow.
970WXS	
3199W	Heavy duty hard nose POL with wrench nut and excess flow.
970AW	Soft nose POL with Handwheel.
970HT	Soft nose POL with Handwheel and 60 DMS orifice.
970S	Soft nose POL with wrench nut and 60 DMS orifice.

These inlet fittings are available for assembly into either first stage of single stage regulators. All have ¼" M. NPT connections and are machined from brass.



3199W



970 970AX 970AXS 970AW 970HT 970S

Brackets

RegO Brackets are especially designed for use in installing RegO Regulators in applications requiring the use of a bracket.

Part Number	Material	For Use With Regulator Model:
2302-31	Cadmium Plated Steel	LV3403, LV404B34, LV404B39
2503-22		LV404B4 LV404B9 Series, LV5503 Series LV4403 Series
2503-19	Aluminum	



2503-19



2503-22



2302-31

Manifolds

Tee Check Manifolds

1350R and 1450R

For use in systems that require uninterrupted gas service during cylinder exchange. Especially for summer cottages, mobile homes and single appliance loads.

Part Number	Inlet Connections	Outlet Connection
1350R	F. POL	M. POL
1450R	1/4" Inverted Flare	1/4" M. NPT



1350R



1450R

Multiple Cylinder Manifolds

1350E and 1450E

Use with suitable pigtailed to connect multiple cylinders together. Ideal for loads that require more than one cylinder to be in service at a time.

Part Number	Inlet Connections	Outlet Connection
1350E	F. POL	M. POL
1450E	1/4" Inverted Flare	1/4" M. NPT



1450E



1350E

Adjustable Flexible Vent Kit

Part Number	Flex Tubing Length	Reusable End Connectors	90° Elbow	Mounting Bracket
LV960-48	48" (4 feet)	2	1	3
LV960-72	72" (6 feet)			4
LV960-120	120" (10 feet)			5



LV960

Test Kits

Low Pressure Test Set

2434A Series

This kit provides the equipment necessary for checking regulator delivery pressure (low pressure) at the appliances. The basic set contains a 2424A-2 low pressure gauge and a 3 foot — 3/16" O.D. flexible synthetic rubber tube. Adapters are also available.

Part Number	Contents	Adapters	Adapter size
2434A	Test Kit	1328	3/8" OD
		1331	1/2" OD
		1332	5/8" OD



2434A



1328 Adapter

Water Manometer Kit

1212 Kit

The water manometer kit is especially suited for use with low pressure LP-Gas systems. It is ideal for pressure checks downstream of the low pressure regulator and at the appliances.

Part Number	Description
1212 KIT	Flexible Tube Water Manometer Kit



1212 KIT

Accessories

High Pressure Gauge Adapter

2962

Designed for testing high pressure lines. Adapter has 0 to 300 psig (0 to 20.68 barg) gauge. A bleeder valve allows you to bleed down to correct pressure during pressure tests.

Part Number	Inlet Connection	Outlet Connection	Pressure Gauge Range (psig)	Pressure Gauge Range (barg)
2962	Soft Nose M. POL	F. POL	0 - 300	0-20.68



2962

Adhesive Warning Labels

These adhesive warning labels are intended for application as close as possible to the LP-Gas regulator once the regulator has been installed.

Part Number	Description
LV4403-400	Adhesive Warning Label



LV4403-400

DANGER
READ THIS FIRST
WARNING

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS...**EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Make sure you are thoroughly trained before you attempt any regulator installation or maintenance. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NFPA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warning "LP-Gas Regulators" found in the regulator section of the L-500 & L-102 Catalogs. Follow its recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Pamphlet 58 also states that "All regulators for outdoor installations, except regulators used for portable industrial applications, shall be designed, installed or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud or debris). This protection may be integral with the regulator."

Vents must be clear and fully open at all times. An obstructed vent will prevent the regulator from functioning properly and may result in property damage and personal injury.

Regulators should be installed with the vent facing down or otherwise covered for protection.

Twin-Stage Regulators should be installed completely under cover and/or with screened vent pipe away adapters that position both vents in a down position without obstructing flow through the vents.

Make sure piping is clean and free from foreign material (such as dirt, corrosion, chips, pipe joint compound, etc.) Always replace the pigtail when replacing a regulator. Thread sealant used on piping must be compatible with LP-Gas.

Make sure the use and location of the regulator(s) as a component(s) of the LP-Gas system to be installed is proper. (Avoid misusing LP-Gas equipment.) See the following RegO publications: L-500 & L-102 Catalogs and the LP-Gas Serviceman's manual.

For underground installations, make sure that water, mud, dirt, and insects cannot get into the regulator, and that the regulator is easily accessible for regulator maintenance. Follow NFPA Bulletin 401. See RegO Safety Warning "LP-Gas Regulators" found in the regulator section of the L-500 & L-102 Catalogs.

Check regulator and installation for leaks following NFPA #54 and NFPA Bulletin 403 "Pressure Testing and Leak Checking LP-Gas Piping Systems".

In selecting a label for posting at the installation site, consider RegO part number 2403-400 along with your own, NFPA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warning "LP-Gas Regulators" found in the regulator section of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.

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Part number LV4403-500
Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

LV4403-500

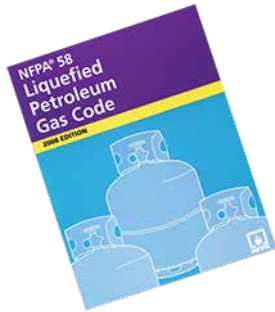
Warning Notice

The following warning information, Part Number LV4403-500, is included with each shipment of regulators to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

LP-Gas Cylinder and Service Valves

Safety Warnings



Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

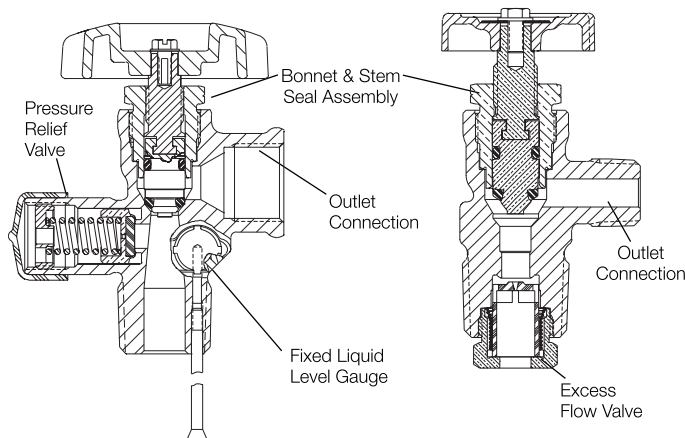
The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

Nature of Warnings

It is recognized that warnings should be as brief as possible, but the factors involved in cylinder valve failure are many because of the multiple functions the valve serves. If there is any simple warning, it would be:

Check cylinder valves for leaking components every time cylinders are filled.

The bulletin is not intended to be an exhaustive treatment of the subject of cylinder valves and certainly does not cover all safety practices that should be followed in installation, operation and maintenance of LP-Gas systems which include cylinder valves.



LP-Gas Cylinder Valves

These valves are mounted in DOT cylinders, and are intended to provide one or more of the following functions:

1. Vapor service shut-off
2. Liquid service shut-off (with excess flow valve)
3. Liquid filling
4. Pressure relief
5. Fixed liquid level gauge

These functions, although simple, are extremely critical in the safe operation of an LP-Gas cylinder system.

Abuse of these valves, failure to follow a good installation and maintenance program and attempting to use cylinder valves beyond their normal service life can result in extremely hazardous conditions.

Important Factors:

1. Installation: It should not be necessary to remind the readers that cylinder valves must be installed and used in strict conformance with NFPA Pamphlet 58, and all other applicable codes and regulations. Codes, regulations and manufacturers' recommendations have been developed by experts with many years of experience in the LP-Gas industry in the interest of safety for users of LP-Gas and all personnel servicing LP-Gas systems. Failure to fully follow these codes, regulations and recommendations could result in hazardous installations.

2. The bonnet and stem seal assembly of a cylinder valve are extremely critical, since any malfunction could cause external leakage and spillage. Check bonnet to see that it is in proper position. If there is any doubt about tightness of threaded connection between bonnet and body, valve must be repaired in accordance with manufacturers' repair instructions before cylinder is filled. Handwheel must be in good condition, stem threads must not be worn or damaged and bonnet must be properly assembled. This area should be examined each time the cylinder is filled. A leakage test should be conducted while the shut-off valve is in the open position during filling.

3. The cylinder outlet connection is usually a female POL. Threads must be free of dents, gouges and any indication of excessive wear. Seating surface inside this connection must be smooth and free of nicks and scratches to ensure a gas tight seal when connected to a male POL cylinder adapter. Cylinder adapter must spin on freely all the way, without indication of drag, roughness or excessive looseness, and must then be tightened with a wrench. Connection must be checked for leakage.

4. The pressure relief valve is of critical importance: Its proper operation is vital in avoiding excessive pressures during emergencies, such as overfilling or exposure to excessive heat. No repair of this device is allowable. Relief valve should be visually inspected and checked for leaks each time the cylinder is returned for filling. All flow passages must be clean and free of foreign material.

LP-Gas Cylinder and Service Valves

Entire assembly must be free of dents, distortion or other indications of damage. If relief valve appears too contaminated or damaged, the cylinder valve must be replaced. (Caution: Eye protection must be used when examining relief valves under pressure.)

5. The liquid service shut-off valve, with excess flow valve provided on some cylinder valves, is also of critical importance. The excess flow valve must be periodically tested for proper performance, in addition to the inspection of the shut-off valve.

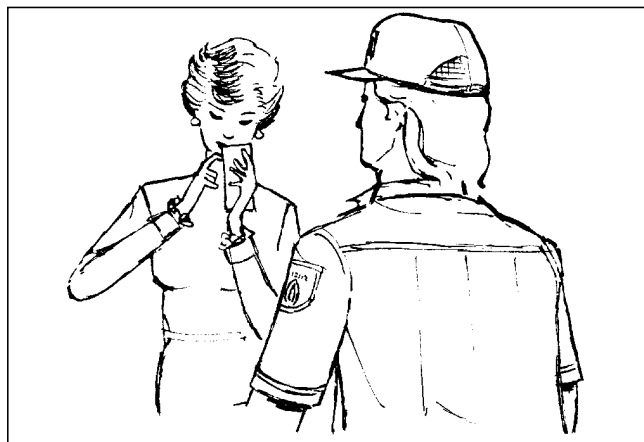
6. The fixed liquid level gauge on a cylinder valve is, when present, essential to prevent overfilling the cylinder. The gauging valve must operate freely, venting vapor when loosened, and sealing gas-tight easily when tightened with the fingers. Gauge valves meant for use with a socket key or screwdriver must also seal easily without excessive torque. The fixed liquid level gauge diptube must be of the proper length, and be in proper position. Periodic test should be conducted by weighing the cylinder after filling, to determine that it does not contain more than the allowable amount of LP-Gas. This check should be done periodically, and any time there is suspicion that the gauge diptube may be damaged or broken.

Do Not Overfill Cylinders

Do not fill a cylinder without first repairing or replacing the cylinder valve, as required, if any defect is noted.

While not required by codes, it is recommended that a plug or suitable protection be inserted in the POL outlet of the cylinder valve at all times except during filling and while connected for use. This will guard against discharge of gas should the handwheel be inadvertently opened while the cylinder is in storage or transit. This is highly advisable for small cylinders that could be transported inside an automobile or trunk. It is important that proper wrenches and adapters be used when filling, servicing and installing cylinder valves in order to avoid damage to the valve or associated piping.

Since cylinders are often used by consumers without previous knowledge of the hazards of LP-Gases and the LP-Gas dealers are the only ones who have direct contact with the consumers, **it is the dealers' responsibility to make sure that his customers are properly instructed in safety matters relating to their installation.**



At the very minimum, it is desirable that these customers:

1. Know the odor of LP-Gas and what to do in case they smell gas. Use of the NPGA "Scratch 'n Sniff" leaflet could be productive.
2. Are instructed never to tamper with the system.
3. Know that when protective hoods are used to enclose regulators and/or valves, that these hoods must be closed, but not locked.
4. Know the location of the cylinder shut-off valve in emergencies.

General Warning

All RegO Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber.

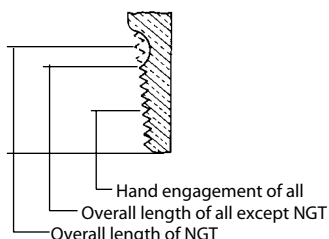
The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential. Because RegO Products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a cylinder valve is used beyond its safe service life. Life of a cylinder valve is determined by the environment in which it "lives". The LP-Gas dealers know better than anyone what this environment is. NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could affect them.

Thread Specifications

Cylinder Valve Threads

Because of the many thread forms available on equipment used in the LP-Gas industry today, the maze of letters, numbers and symbols which make up various thread specifications becomes confusing. To help eliminate some of this confusion, a brief explanation of some of the more widely used thread specifications is shown below.

Inlet Connections



NGT and NPT Threads

The NGT (National Gas Taper) thread is the commonly used valve-to-cylinder connection. The male thread on the valve has about two more threads at the large end than the NPT in order to provide additional fresh threads if further tightening is necessary. Additionally, the standard $\frac{3}{4}$ " NGT valve inlet provides the greater tightness at the bottom of the valve by making the valve threads slightly straighter than the standard taper of $\frac{3}{4}$ " per foot in NPT connections. In all other respects NPT and NGT threads are similar.

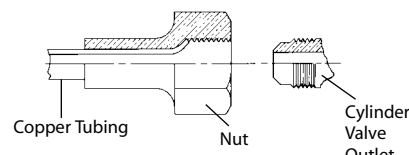
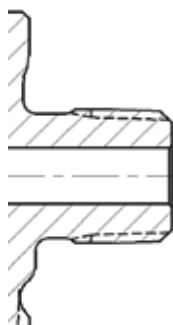
Outlet Connections

CGA Outlets

The CGA (Compressed Gas Association) outlets are standard for use with various compressed gases. The relation of one of these outlets to another is fixed so as to minimize undesirable connections. They have been designed to prevent the interchange of connections which may result in a hazard.

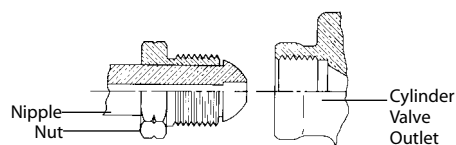
3/8"-18 NPT Thread Connection

This connection is also used for vapor or liquid withdrawal. It has a $\frac{3}{8}$ " diameter thread, and 18 threads per inch, National Pipe Taper Outlet form.



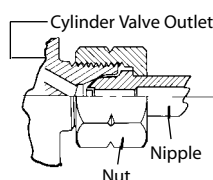
CGA 182, or SAE Flare

This connection ensures a leak-tight joining of copper tubing to brass parts without the need for brazing or silver soldering. The common size used on LP-Gas valves and fittings is $\frac{3}{8}$ " SAE (Society of Automotive Engineers) flare. Although this connection is referred to as a $\frac{3}{8}$ ", because $\frac{3}{8}$ " OD tubing is used, the thread actually measures $\frac{5}{8}$ ". The specifications are .625 – 18 UNF – 2A – RH – EXT, which means .625" diameter thread, 18 threads per inch, Unified Fine Series Class 2 Tolerances, right-hand, external thread.



CGA 555

CGA 555 is the standard cylinder valve outlet connection for liquid withdrawal of butane and/or propane. Thread specification is .903" – 14 NGO – LH – EXT, which means .903" diameter thread, 14 threads per inch, National Gas Outlet form, left-hand external thread.



CGA 510 or POL

Most widely used in this industry, POL is the common name for the standard CGA 510 connection. Thread specification is .885" – 14 NGO – LH – INT, meaning .885" diameter thread, 14 threads per inch, National Gas Outlet form, left-hand internal thread. RegO POL outlet connections for LP-Gases conform to this standard.

LP-Gas Cylinder and Service Valves

General Information

The wide acceptance of RegO Cylinder Valves is based on their reliable performance as well as their reputation for engineering and manufacturing excellence.

Together with thorough testing, these efforts result in years of trouble-free service. RegO Cylinder Valves are listed by Underwriters' Laboratories and approved by the Bureau of Explosives for pressure relief valve operation, wherever applicable. See section on relief valves for important information.

Reliability

RegO Cylinder Valves are built with attention to each detail: Beginning with comprehensive inspection of forgings and machined parts, and ending with intense quality testing on each individual valve prior to shipment.

Every valve must pass a stringent and comprehensive underwater leakage test. Additionally, valves with pressure reliefs are tested for proper pressure and operation, including reseating to ensure proper opening and closing at required pressures. Those equipped with excess flow checks are tested for compliance with published closing specifications, and tested to ensure minimum leakage after closing.

Instructions for the Proper Use and Applications of RegO Cylinder Valves

1. Containers and pipe line should be cleaned thoroughly before valves are installed. Large particles of solid foreign matter can cut the seating surface of any resilient seat disc, causing the valve to leak. Care must be exercised in inserting valves into lines or containers to avoid damaging or exerting pressure against pressure relief valves and outlet connections. Use a minimum amount of a suitable luting compound on the cylinder valve threads only. Excess amounts of luting compound can foul the operating parts of the valves.

Heavy-Duty Valve Stem Seals

RegO Cylinder Valves utilize seat discs and stem seals which resist deterioration and provide the kind of reliable service required for

LP-Gas utilization. Diaphragm or O-Ring stem seals are available. Valves with diaphragm stem seals are recognized for their heavy-duty body design and are suitable for use in cylinders up to 200 lbs. propane capacity.

O-Ring type stem seals are the most widely accepted in the industry. The simple, economical and long life design features a tapered and confined nylon seat disc which provides positive, hand-tight closings, and a faster filling cylinder valve.

Pressure Relief

RegO Valves have full-capacity "pop action" pressure reliefs with start to discharge settings starting at 375 psig (25.86).

A Valve for Every Need

RegO Cylinder Valves are available for all LP-Gas services; a wide choice for domestic, commercial, industrial, RV, motor fuel, and lift truck applications.

Valves are available with a combination of options such as pressure reliefs, liquid level gauges, and liquid withdrawal tubes. Also available for special applications are plumber's pot valves, tamper resistant valves for field service, and dual valves for simultaneous liquid and vapor service.

2. Do not use excessive force in opening or closing the valves. The seat disc and diaphragm materials permit the valves to be opened and closed easily by hand. Never use a wrench on wheel handle valves.

3. When the design of the piping installation allows liquid to be locked between two valves, a hydrostatic relief valve must be installed in the line between the two valves. The pressures which can develop due to temperature increase in a liquid full line are tremendous and can cause rupture of the line or damage to the valves.

4. The valves are designed to withstand normal atmospheric temperatures. They should not, however, be subjected to abnormally high temperatures.

Design Features of RegO Cylinder Valves

Valve Stems On 901, 9101, 9102 and 9103 Valves

Are machined with a double lead thread for quick opening and closing as well as high lift.

Forged Brass Body

Pressure Relief

Provides quick discharge of excess pressure. Relief seat disc is special resilient composition rubber.

Tapered Seat Openings On 9101, 9102 and 9103 Valves

Permit increased flow rates resulting in faster charging.

Back Seat On 901, 9101, 9102 and 9103 Valves

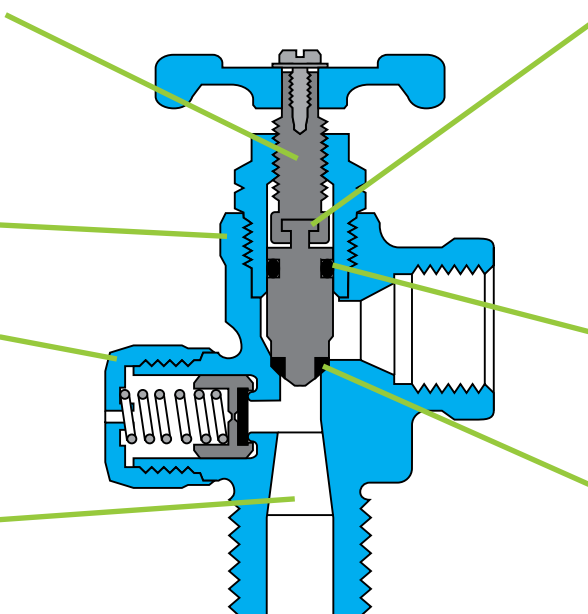
Is metal-to-metal seating to provide added protection against leakage while the valve is open. Back seat the valve while in operation.

O-Rings

For positive leak-proof seals under temperature and pressure variations.

Seat Disc

Is a tapered nylon in a fully confined seat to ensure easy, leak-free, positive shutoffs. Seat disc also provides a separate swivel action to minimize scoring by impurities.



Heavy-Duty Cylinder Valves for Vapor Withdrawal 9103 Series

This heavy duty cylinder valve is designed for vapor withdrawal of DOT cylinders up to 100 lbs. propane capacity. It is used in domestic hookups and industrial commercial installations.



Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Dip Tube Length w/ Deflector	Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use in Cylinders w/ Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Accessories
								Pressure Drop Across Valves				POL Plug
								10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg	100 psig 6.89 barg	
*9103D10.6	¾" M NGT	F. POL (CGA 510)	Yes	10.6"	375 psig	25.86 barg	100 lbs.	12.7 (GPM)	20.3 (GPM)	29.0 (LPM)	41.3 (GPM)	N970P
*9103D11.6				11.6"				48.07 (LPM)	76.84 (LPM)	109.78 (LPM)	156.34 ((LPM)	

* 72 Orifice low emission version is also available.

Tamper-Resistant Cylinder Valve with Outlet Check for Vapor Withdrawal 9103T9F

This valve is designed for vapor withdrawal from and protection of DOT cylinders up to 100 lbs. propane capacity. Ideal for cylinders used in the field by construction crews, utility repair men and plumbers.



Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use in Cylinders w/ Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM			
							Pressure Drop Across Valves			
							10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg	100 psig 6.89 barg
9103T9F	¾" M. NGT	F. POL (CGA 510)	None	375	25.86	100 lbs.	5.0	7.6	10.7	14.9

NOTE: These valves incorporate an excess flow valve.
Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

Cylinder Valve for RV and Small ASME System Vapor Withdrawal 9106CO

Designed especially for vapor withdrawal service in small ASME containers with surface area up to 23.8 square feet. UL flow capacity is 645 SCFM (0.3 CPMS)/air.



Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use In Cylinders w/ Propane Capacity Up To	Flow Capacity SCFM/ Air	Flow Capacity CPMS/ Air
9106CO	¾" M. NGT	F. POL (CGA 510)	none	312	21.51	ASME Tanks*	645	0.3

* Surface area up to 23.8 square feet.



9103D



9103T9F



9106CO

Cylinder Valve for Liquid Withdrawal 9107K8A

Equipped with excess flow valves and liquid withdrawal tubes, they are designed for liquid withdrawal of DOT cylinders up to 100 lbs. propane capacity. They are most often used with heavy BTU loads found in industrial uses.



9107K8A

Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Dip Tube Length	Liquid Withdrawal Tube Length
*9107K8A	3/4" M. NGT	CGA 555	Included	11.6"	44"

* 72 Orifice low emission version is also available.

Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use in Cylinders w/Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Closing Flow (LP-Gas) *		
			Pressure Drop Across Valves				Vapor		Liquid
			10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)	25 psig Inlet (1.72 barg)	100 psig Inlet (6.89 barg)	
375	25.86	100 lbs.	3.3	5.4	7.7	11.1	525 SCFH	1,000 SCFH	1.7 GPM

*Closing flows based on 3/8" O.D. withdrawal tube 44" long or less attached.

IMPORTANT: 1/4" O.D. pigtails or POL connections for 1/4" O.D. pigtails should not be used with these valves.

NOTES: To ensure proper functioning and maximum protection from excess flow valves, the cylinder valve should be fully opened and backseated when in use. These valves incorporate an excess flow valve. Refer to L-500 / Section F, for complete information regarding selection, operation and testing of excess flow valves.

Service Valves for ASME and DOT Containers or Vapor Fuel Line Applications 901C1, 9101C, 9101D, 9101R and PT9102 Series

Designed for vapor withdrawal service on ASME and DOT containers or in fuel line applications. Since none of these valves have an integral pressure relief valve, they may only be used as an accessory valve on containers that have an independent pressure relief valve sufficient for that container's capacity.



Ordering Information

Part Number	Bonnet Style	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Approximate Filling Rate Liquid Flow, GPM, LPM				Ready To Go™
					Pressure Drop Across Valve				
					10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)	
901C1	Standard	¾" M. NGT	F. POL CGA 510	No	5.3 GPM 20.06 LPM	8.2 GPM 31.04 LPM	10.8 GPM 40.88 LPM	14.2 GPM 53.75 LPM	NA
9101C1					8.8 GPM 33.31 LPM	12.4 GPM 46.94 LPM	15.8 GPM 59.81 LPM	21.7 GPM 82.14 LPM	
*9101D11.1				Yes	8.6 GPM 32.55 LPM	12.7 GPM 48. 07 LPM	16.3 GPM 61.70LPM	22.3 GPM 84.41 LPM	
*9101D11.7									
9101R1	MultiBonnet			No	7.6 GPM 28.77 LPM	11.7 GPM 44.29 LPM	15.2 GPM 57.54LPM	20.6 GPM 77.98 LPM	No
*9101R11.1				Yes					Plugged
*9101R11.7									Yes
9102D11.1				No					
9102R11.7									
*PT9102R1				Yes					
*PT9102R11.1									
*PT9102R11.7									

* 72 Orifice low emission version is also available.

Note: Since these valves have no integral pressure relief valve, they can be used on any container with an independent relief device sufficient for that tank's capacity.



901C1



9101R1



PT9102



9101D

Service Valves for ASME Motor Fuel Containers 901C, 9101H, and 9101Y Series

Designed specifically for vapor or liquid withdrawal service on ASME motor fuel containers. Since none of these valves have an integral pressure relief valve, they may only be used as an accessory valve on containers that have an independent pressure relief valve sufficient for that container's capacity.

The integral excess flow valve found in all these service valves helps prevent excessive product loss in the event of fuel line rupture.

When installed for liquid withdrawal, the 9101H6 has provisions for attachment of a liquid withdrawal tube. All other valves must be installed in containers that have provisions for a separate liquid withdrawal.

To ensure proper functioning and maximum protection from integral excess flow valves, these service valves should be fully opened and backseated when in use.



Ordering Information

Part Number	Container Connection	Service Connection	Liquid Withdrawal Connection	Closing Flow (LP-Gas)			
				Vapor		Liquid (GPM)	Liquid (LPM)
				25 psig (1.72 barg) Inlet (SCFH)	100 psig (6.89 barg) Inlet (SCFH)		
901C3	¾"M. NGT	F. POL CGA 510	None	350***	605***	1.5***	5.68
901C5				550***	1050***	2.6***	9.84
9101H3		⅜" SAE Flare		430**	800**	1.5**	5.68
9101H5*				765**	1300**	3.6**	13.63
9101H6*			¼" NPT	550****	1050****	2.6****	9.84
9101Y5H*		60° Angle ⅜" SAE Flare	None	765**	1300**	3.6**	13.63

* Heavy-duty models

** Based on 3/8" O.D. pigtail, 20" long or less, connected to valve outlet. For greater lengths, the pigtail must have a larger O.D.

*** Same as (**). In addition, 1/4" O.D. pigtails or POL connections for 1/4" O.D. should not be used with this valve.

**** Based on 3/8" O.D. pigtail; 20" long or less, connected to valve outlet. Also based on 1/4" pipe size dip tube, 42" long or less, attached to special inlet connection. For longer pigtail lengths, the diameter of the pigtail must be increased.

NOTE: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

"Dual" Cylinder Valve for Simultaneous Liquid and Vapor Withdrawal 8556

This dual cylinder valve was designed especially for industrial uses. It increases the cylinder's flexibility by permitting DOT cylinders up to 100 lbs. propane capacity to be used interchangeably or simultaneously for either liquid or vapor withdrawal.



8556

Ordering Information

Part Number		Container Connection	Service Connection		Fixed Liquid Level Vent Valve Style	Liquid Withdrawal Tube Length
			Vapor	Liquid		
8556		¾" M. NGT	F. POL (CGA 510)	CGA 555	None	44"

Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use in Cylinders w/Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM, LPM				Liquid Closing Flow* (LP-Gas) (GPM)	Liquid Closing Flow* (LP-Gas) (LPM)
			Pressure Drop Across Valves					
			10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)		
375 psig	25.86	100 lbs.	6.6 (GPM) 24.98 (LPM)	10.0 (GPM) 37.85 (LPM)	14.5 (GPM) 54.89 (LPM)	21.0 (GPM) 79.49 (LPM)	2.3 GPM	8.71 LPM

* To ensure proper functioning and maximum protection from integral excess flow valves, the cylinder valve should be fully opened and backseated when in use.

NOTE: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

Service Valves for DOT Fork Lift Containers 9101P5 and 9101P6 Series

Designed specifically for vapor or liquid withdrawal service on DOT fork lift containers. Valves with 1.5 GPM (5.68 LPM) closing flow are for use in small and medium size lift truck applications, while those with 2.6 GPM (9.8 LPM) closing flow are for large lift trucks. Since none of these valves have an integral pressure relief valve, they may only be used as an accessory valve on containers that have an independent pressure relief valve sufficient for that cylinder's capacity.

The integral excess flow valve found in all these service valves helps prevent excessive product loss in the event of fuel line rupture.

When installed for liquid withdrawal, the 9101P6 Series has provisions for attachment of a liquid withdrawal tube. The 9101P5 Series must be installed in containers that have provisions for a separate liquid withdrawal.

To ensure proper functioning and maximum protection for integral excess flow valves, these service valves should be fully opened and backseated when in use.

Ordering Information

Part Number	Container Connection	Service Connection	Liquid Withdrawal Connection	Closing Flow (LP-Gas)			Approximate Filling Rate Liquid Flow, GPM, LPM				Accessories		
				Vapor		Liquid (GPM)	Pressure Drop Across Valve				ACME Check Connectors		
				25 psig (1.72 barg) Inlet (SCFH)	100 psig (6.89 barg) Inlet (SCFH)		10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)	Male	Female	Cap
9101P5	¾" M. NGT	¾" M. NPT	None	430	900	1.5 GPM 5.7 LPM	5.0 GPM 18.9 LPM	7.6 GPM 28.8 LPM	10.7 GPM 40.5 LPM	14.9 GPM 56.4 LPM	7141M	7141F	7141M-40 or 7141FP
9101P5H				550	1050	2.6 GPM 9.8 LPM							
9101P6			¼" NPT	430	900	1.5 GPM 5.7 LPM	4.5 GPM 17.03 LPM	7.2 GPM 27.3 LPM	10.3 GPM 38.99 LPM	14.8 GPM 56.02 LPM			
9101P6H				550	1050	2.6 GPM 9.8 LPM							

Note: These valves incorporate an excess flow valve. Refer to L-500/Section F, for complete information regarding selection, operation and testing of excess flow valves.

Cylinder Valve for Propylene Service 9104PT and 9104PPA

Designed for vapor withdrawal from and protection of DOT cylinders up to 100 lbs. propylene capacity with pressure ratings such as 4B-260, 4BA-260, and 4BW-260 cylinders.

Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length*	Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For use in Cylinders w/ Propylene Capacity up to:
9104PPA	¾" M.NPT	F.POL - (CGA 510)	N/A	N/A	435	29.99	100lbs
*9104PT10.1			Knurled	10.0"			
*9104PT10.7				10.7"			

* Valve can be ordered with other dip tube lengths. Specify required length when ordering. X = dip tube size



**9101P5
9101P5H**



**9101P6
9101P6H**



9104PT



9104PPA

Adhesive Warning Labels 901-400 and 903-400

These adhesive warning labels are intended for application as close as possible to the cylinder valve and/or service valve.

The basic information contained on the label is intended for the benefit of the user of the valves and is not intended to be an “all-inclusive” product warning.

These labels are printed on a heavy duty material with pressure sensitive adhesive backing. The ultra-violet ink stands up well when exposed to the environment.

Part Number	
901-400	Adhesive Label Primarily for Fork Lift Cylinders
903-400	Adhesive Label Primarily for Small DOT Cylinders
903-500	Adhesive Label Primarily for Cylinder and Service Valves

DANGER
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR THIS HISS OF ESCAPING GAS... IMMEDIATELY GET AWAY FROM THIS CYLINDER! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE
KEEP CYLINDER OUT OF THE REACH OF CHILDREN
WARNING
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR THIS HISS OF ESCAPING GAS... IMMEDIATELY GET AWAY FROM THIS CYLINDER! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.

This container is filled with highly flammable LP-Gas under pressure. A serious fire or explosion can result from leaks and misuse or misloading of the container and its valves. Do not mix, heat or fill the container by any of its valves. Do not expose to fire or temperatures above 120°F (49°C) or 20 (unfilled and exposed to temperatures higher than the temperatures at the time it was filled).
 The container is equipped with a pressure relief valve. The pressure relief valve can open at a large jet of LP-Gas into the air if the container is exposed to high temperatures above 120°F (49°C) or 20 (unfilled and exposed to temperatures higher than the temperatures at the time it was filled).
 The pressure relief valve is equipped with a protection cover. The protection cover must remain in place at all times except when refilling the valve. CAUTION: Use eye protection. If fluid, gas, moisture or other foreign material enters the valve, it may be further properly to prevent container failure or rupture. Do not use the valve for anything other than its intended purpose.
 Each time the container is filled, the pressure relief valve must be checked to ensure that it is completely unobstructed and that it has no physical damage. If there is any doubt about the condition of the valve, the container must be removed from service and the pressure relief valve must be replaced.
 Only trained personnel should be permitted to fill this container. Before the container is filled for the first time, it must be purged of air. The total liquid volume of LP-Gas must never exceed the amount designated by applicable filling density regulations for this container.
 Valves on the protection cap or in place on the ASME marked fill valve at all times. Never insert a screwdriver or other tool into the valve as it can damage the seal and gaskets and cause an uncontrolled leak.
 Do not allow any sunlight if the head liquid level gauge is used during filling. Filling should stop the moment a white LP-Gas cloud is visible from the liquid level. Keep the cylinder upright at all times.

This container contains highly flammable LP-Gas under pressure. A serious fire or explosion can result from leaks and misuse or misloading of the cylinder and its valves. Do not mix, heat or fill the cylinder by its valves. Do not expose to fire or temperatures above 120°F (49°C).
 The cylinder valve incorporates a Shut-Off Valve and Pressure Relief Valve. The Pressure Relief Valve can open a large jet of LP-Gas into the air if the cylinder is exposed to high temperatures - over 120°F (49°C) or 20 (unfilled and exposed to temperatures higher than the temperature at the time it was filled).
 Never attempt to fill this cylinder yourself. Do not tamper with it or attempt repairs.
 Only trained LP-Gas Dealer personnel should be permitted to fill this cylinder and to repair or replace its valves. Each time the cylinder is filled, the entire Cylinder Valve must be checked for leaks (with a leak detection solution - leaks cause bubbles to grow). The Shut-Off Valve and Fixed Liquid Level Gauge (if incorporated) must be checked for proper operation. The Pressure Relief Valve must be checked to ensure that it is completely unobstructed and that it has no physical damage. CAUTION: eye protection must be worn when working with this valve.

This container must be used only in compliance with all applicable laws and regulations, including National Fire Protection Association Publication 858, which is the law in many states. A copy of this publication may be obtained by writing NFPA, Batterymarch Park, Quincy, MA 02269.

DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL.
 DO NOT FILL THIS CONTAINER UNLESS THIS LABEL IS READABLE.

ADDITIONAL SAFETY INFORMATION
 IS AVAILABLE FROM: **REGO**
 REGO, N.C. 27244 USA • www.regoproducts.com
 Phone (336) 449-7707 • Fax (336) 449-6594

Printed in U.S.A. 04-0414-0386
 Warning 901-400

901-400

The following warning information, Part Number 903-500, is included with each shipment of cylinder valves and service valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

DANGER!
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR THIS HISS OF ESCAPING GAS... IMMEDIATELY GET AWAY FROM THIS CYLINDER! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE
KEEP CYLINDER OUT OF THE REACH OF CHILDREN
WARNING!
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR THIS HISS OF ESCAPING GAS... IMMEDIATELY GET AWAY FROM THIS CYLINDER! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT USE OR STORE IN BUILDING OR ENCLOSED AREA. FOR OUTDOOR USE ONLY.

This cylinder contains highly flammable LP-Gas under pressure. A serious fire or explosion can result from leaks and misuse or misloading of the cylinder and its valves. Do not mix, heat or fill the cylinder by its valves. Do not expose to fire or temperatures above 120°F (49°C).
 The cylinder valve incorporates a Shut-Off Valve and Pressure Relief Valve. The Pressure Relief Valve can open a large jet of LP-Gas into the air if the cylinder is exposed to high temperatures - over 120°F (49°C) or 20 (unfilled and exposed to temperatures higher than the temperature at the time it was filled).
 Never attempt to fill this cylinder yourself. Do not tamper with it or attempt repairs.
 Only trained LP-Gas Dealer personnel should be permitted to fill this cylinder and to repair or replace its valves. Each time the cylinder is filled, the entire Cylinder Valve must be checked for leaks (with a leak detection solution - leaks cause bubbles to grow). The Shut-Off Valve and Fixed Liquid Level Gauge (if incorporated) must be checked for proper operation. The Pressure Relief Valve must be checked to ensure that it is completely unobstructed and that it has no physical damage. CAUTION: eye protection must be worn when working with this valve.

This cylinder must be used only in compliance with all applicable laws and regulations, including National Fire Protection Association Publication 858, which is the law in many states. A copy of this Publication may be obtained by writing NFPA, Batterymarch Park, Quincy, MA 02269.

DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL! DO NOT FILL THIS CYLINDER UNLESS THIS LABEL IS READABLE!

ADDITIONAL SAFETY INFORMATION
 IS AVAILABLE FROM: **REGO**
 REGO, N.C. 27244 USA • www.regoproducts.com
 Phone (336) 449-7707 • Fax (336) 449-6594

Printed in U.S.A. 06-0414-0394
 Warning 903-400

903-400

DANGER
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS... **EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

READ THIS FIRST
LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS... **EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

WARNING
 AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS... **EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.
 Become thoroughly familiar with NFPA Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valves, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.
 Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."
 Make sure this valve is the proper one for this installation. Avoid mixing LP-Gas equipment.
 Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.
 Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.
 Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.
 Check container- valve connection with a non-corrosive leak detection solution before filling with LP-Gas.
 Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).
 Test excess flow check valve for proper operation before placing into service. See NFPA Bulletin 113 for recommended procedure.
 Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.
 RegO Filler Valves: To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 3119A, 3120 and 3121 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.
 If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.
 In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NFPA's and others.
 Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.

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REGO
 ELON, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

Printed in USA 09A-0910-0686
 Part number 903-500

903-500

RegO Multivalve® Assemblies

General Information

RegO Multivalves® were pioneered in the 1930's. By combining several valve functions in one unit, Multivalves® made possible new and more practical tank designs (fewer openings and smaller, less cumbersome protective hoods). They received immediate acceptance.

The Multivalve® design has kept pace with changing industry needs over the years. They are as popular as ever; still keeping fabricating costs down and reducing operating expenses for the LP-Gas dealer.

RegO Multivalves® Reduce the Cost of Fabrication by

- Combining several valve functions in one less expensive body.
- Reducing the number of threaded openings in ASME containers.
- Diminishing the size and cost of protective hoods.
- Providing generous sized wrenching bosses for quick, easy installation.

RegO Multivalves® Reduce LPG Dealer Expenses by

- Permitting on-site filling of 100 lb. to 420 lb. DOT cylinders, thus eliminating cylinder return and interrupted customer service.
- Providing well-placed hose connections for easy filling.
- Allowing ample space for secure attachment and easy removal of the regulator.
- Providing substantial savings of bonnet repairs on valves with the MultiBonnet®.

RegO Multivalves® Satisfy Customer Demands for Tough, Safe Equipment with These Features

Heavy-Duty Valve Stem Seals —

- Tapered nylon disc in a fully confined seat resists deterioration and provides hand-tight closings over a long service life.

Comprehensive Testing —

- Every Multivalve® must pass a stringent underwater leakage test prior to shipment.
- Multivalves® with pressure relief valves are individually tested and adjusted to ensure proper pressure settings.
- Those equipped with excess flow checks are tested for compliance with published closing specifications and for leakage after closing.

Pressure Relief Valves and Other Devices —

- Multivalves® equipped with integral pressure relief devices employ full-capacity, "pop-action" reliefs with set pressures of 250 psig (17.24 barg) for ASME use and 375 psig (25.86 barg) for DOT cylinders.

Double Back-Check Filler Valves —

- Multivalves® with filling connections have double backcheck safety. If the upper check ceases to function, the lower stand-by check will continue to protect the filling connection from excessive leakage.

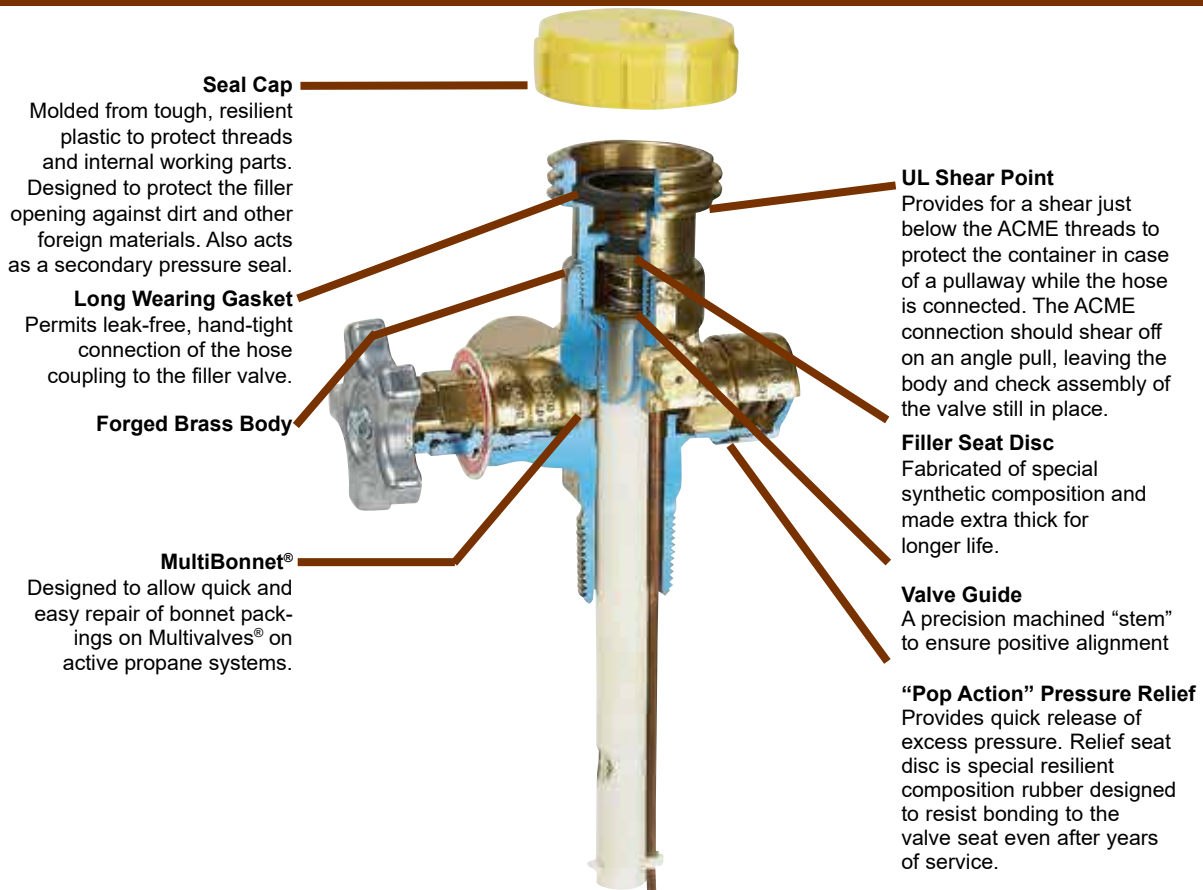
Ease of Maintenance —

- Standardization of parts makes it possible for one repair kit to maintain the bonnet assemblies of RegO cylinder valves, service valves, motor fuel valves, and Multivalves®.

RegO Multivalves® fit every LP-Gas need.

- Wide selection of Multivalves® for domestic, commercial, and industrial needs are available.
- Multivalves® may be ordered with pressure relief, liquid level tube, filler valve, vapor equalizing valve, internal pipe connections, liquid filling and withdrawal connections, and 1/4" NPT tapped opening for pressure gauge with or without steel plug.

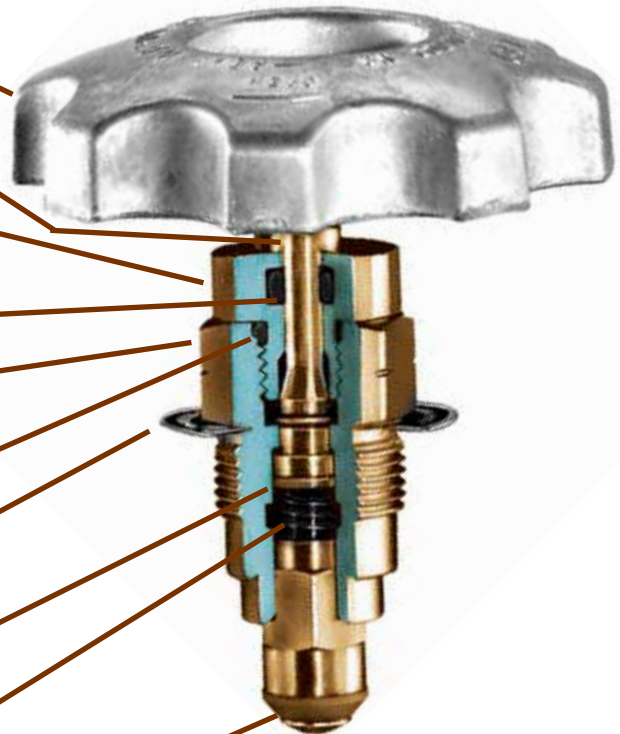
Design Features of RegO Multivalves®



RegO MultiBonnet® Assemblies

Design Features of the MultiBonnet®

- Handwheel**
Aluminum die cast handwheel.
- Non-Rising Stem**
Designed to allow easy backseating and long service life.
- Upper Packing Assembly**
Contains both internal and external o-rings. Provides leak resistant performance.
- Internal O-ring**
- Lower Bonnet and Stem Assembly**
Machined brass construction offers durability to bonnet design.
- External O-ring**
- Nameplate**
Provides easy identification of the RegO MultiBonnet®.
- Teflon Backseat**
Provides for upper packing isolation when valve is fully open.
- Machined Double Lead Threads**
Provides for quick opening and closing of the valve.
- Shut-off Seat Disc**
Tapered nylon disc is retained in a fully confined seat that helps ensure positive shut-offs.



The MultiBonnet® is designed to allow quick and easy repair of bonnet packings in certain Multivalves® and service valves on active propane systems. It allows you to repair valve bonnet stem o-ring leaks in minutes, without interrupting gas service to your customers.

- Eliminates the need to evacuate tanks or cylinders to repair the MultiBonnet® packing.
- Two section design allows repair of MultiBonnet® assemblies on active propane systems without interruption in gas service or shutting off appliances downstream. This helps to prevent time consuming relighting of pilots, special appointments, and call backs.
- Cost of replacing the MultiBonnet® packing is only 1/3 as much as replacing a complete bonnet assembly—not including time cost savings, which can be substantial.

- Available on certain new Multivalves® and service valves as well as repair assemblies for many existing RegO valves.
- UL listed as a component of valve assembly.

Here's How The MultiBonnet® Works

- When the valve is fully open, only the lower stem will rise and backseat against the teflon washer which isolates the upper packing.
- This allows you to remove the upper packing nut, which contains the o-rings, and replace it while the valve is fully open and gas service not interrupted.

ASME Multivalves® for Vapor Withdrawal G8475RL Series Valves with Presto-Tap PG8475, PT7556 Series Valves

These Multivalves® are designed for use in single opening ASME containers equipped with a 2½" M. NPT riser. They can be used with underground ASME containers up to 639 sq. ft. surface area, and above ground ASME containers up to 192 sq. ft. surface area. A separate opening is required for liquid withdrawal. The MultiBonnet® is standard on this valve.



PG8575RV

Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)
G8475RL	42	72	98	125
G8475RLW				
PG8475RL				

Ordering Information

Part Number	Container Connection	Service Connection	Filling Connection	Relief Valve Height	Vapor Equalizing Connection		Float Gauge Flange Opening	Fixed Liquid Level Vent Valve	Dip Tube Length	Pressure Relief Valve						For use in containers w/ surface area up to:	
					Size	UL Listed Closing Flow				Setting (psig)	Setting (barg)	Part Number	Flow Capacity				
													UL SCFM	UL CPMS	ASME SCFM		ASME CPMS
G8475RL	2½" F. NPT	F. POL (CGA 510)	1¼" M. ACME	6¾"	1¼" M. ACME	4200 CFH @ 100 psig (6.89 barg)	Fits "JUNIOR" size	Yes	30**	250	17.24	M3131G	2020 SCFM, air	0.95 CPMS, air	1939 SCFM, air	0.92 CPMS, air	83 sp ft. above ground
*G8475RLW				8½"								MV3132G	3995 SCFM, air	1.89 CPMS, air	n/a	n/a	192 sq ft. above ground 639 sp ft. under ground

*Dip tube not installed, may be cut by customer to desired length.

** 72 Orifice low emission version is also available.

ASME Multivalves® for Vapor Withdrawal 8593AL

These Multivalves® provide vapor withdrawal and filling of ASME containers. A separate pressure relief valve is required in addition to this valve. The MultiBonnet® is standard on this valve.



8593AL

Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM, LPM			
	Pressure Drop Across Valve			
	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)
8593AL16.0	42 GPM 158.99 LPM	72 GPM 272.5 LPM	98 GPM 370.97 LPM	125 GPM 473.18 LPM

Ordering Information

Part Number	Container Connection	Service Connection	Filling Connection	Vapor Equalizing Connection		Fixed Liquid Level Vent Valve Style	Dip Tube Length	For Use In Containers w/ Surface Area Up To:
				Connection Size	UL Listed Closing Flow			
8593AL16.0	1½" M. NPT	F. POL (CGA 510)	1¼" M. ACME	1¼" M. ACME	4200 CFH at 100 psig (6.89 barg)	Knurled	16"	**

*Dip tube not installed, may be cut by customer to desired length.

**Since these Multivalves® have no integral pressure relief valves, they can be used on any ASME container with an independent relief device sufficient for that tank's capacity.

DOT Multivalve® for Liquid Withdrawal 8555DL

These Multivalves® permit liquid withdrawal from DOT cylinders with up to 100 lbs. propane capacity. They eliminate unnecessary cylinder handling when servicing high volume loads and allow on-site filling into the vapor space without interrupting gas service.

Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM, LPM			
	Pressure Drop Across Valve			
	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)
****8555DL11.6	8 GPM 30.3 LPM	23 GPM 87.1 LPM	34 GPM 128.7 LPM	42 GPM 158.99 LPM



8555DL

Ordering Information

Part Number	Container Connection	Service Connection	Filling Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length w/ Deflector	Liquid Withdrawal Tube Length	Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use In Cylinders w/Propane Capacity Up To:	Liquid Closing Flow (LP-Gas)*** GPM	Liquid Closing Flow (LP-Gas)*** LPM
****8555DL11.6	3/4" M. NGT	CGA 555*	1 1/4" M. ACME	Knurled	11.6"	44"	375	25.86	100 lbs. **	1.7 GPM	6.4 LPM

* Use adapter 12982 to connect to pipe threads.

** Per CGA Pamphlet S-1.1.

*** To ensure proper functioning and maximum protection from integral excess flow valves, the cylinder valve should be fully opened and backseated when in use.

****72 orifice low emission version is also available.

DOT & ASME Multivalves® for Vapor Withdrawal 6555R, 8555D and 8555R Series

These Multivalves® permit vapor withdrawal. They allow for container filling without interrupting gas service.

The 6555R Series is designed for ASME containers with up to 25 ft² surface area or 60 gallons water capacity.

The 8555D and 8555R Series are designed for DOT cylinders with up to 200 lbs. propane capacity.



8555R

Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)
**6555D Series	8 GPM 30.3 LPM	23 GPM 87.1 LPM	34 GPM 128.7 LPM	42 GPM 158.99 LPM
**6555R Series				
**8555D Series				
**8555R Series				

Ordering Information

Part Number	Bonnet Style	Application	For Use In Containers with Size Up To:	Dip Tube Length w/ Deflector	Container Connection	Service Connection	Filling Connection	Fixed Liquid Level Vent Valve	Pressure Relief Valve			
									Setting psig	Setting barg	Flow Capacity*	
											UL Listing	ASME
**6555R10.6	MultiBonnet®	ASME Containers	25 ft² surface area or 60 gallons water capacity	10.6"	¾" M. NGT	F. POL (CGA 510)	1¾" M. ACME	Yes	250	17.23	793 SCFM 0.37 CPMS, air	700 SCFM 0.33 CPMS, air
**6555R11.6	MultiBonnet®			11.6"								
**6555R12.0	MultiBonnet®			12.0"								
**8555D10.6	Standard	DOT Cylinders	200 lbs. Propane **	10.6"	¾" M. NGT	F. POL (CGA 510)	1¾" M. ACME	Yes	375	25.86	n/a	n/a
**8555R10.6	MultiBonnet®			11.6"								
**8555D11.6	Standard											
**8555R11.6	MultiBonnet®											

*Per CGA Pamphlet S-1.1.

**72 orifice low emission version is also available.

DOT and ASME Multivalves® for Vapor Withdrawal 6532, 6533, 6542, 6543 Series and PT6542, PT6543 Series with Presto-Tap®

These Multivalves® permit vapor withdrawal from ASME containers up to 50 sq. ft. surface area and DOT containers up to 420 lbs. propane capacity. They allow on-site cylinder filling without interrupting gas service.



Liquid Filling Rates

Part Number	Approximate Filling Rate -- Liquid Flow, GPM, LPM			
	Pressure Drop Across Valve			
	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	100 psig (6.89 barg)
6532A12.0/6532R12.0	11 GPM 41.7 LPM	16 GPM 60.6 LPM	23 GPM 87.1 LPM	28 GPM 105.99 LPM
6542A12.0/6542R12.0	23 GPM 87.1 LPM	32 GPM 121.1 LPM	46 GPM 174.1 LPM	57 GPM 215.8 LPM
6533A10.5/6533R10.5	11 GPM 41.7 LPM	16 GPM 60.6 LPM	23 GPM 87.1 LPM	28 GPM 105.99 LPM
6533A11.7/6533R11.7	11 GPM 41.7 LPM	16 GPM 60.6 LPM	23 GPM 87.1 LPM	28 GPM 105.99 LPM
6543A11.1/6543R11.1	23 GPM 87.1 LPM	32 GPM 121.1 LPM	46 GPM 174.1 LPM	57 GPM 215.8 LPM
6543A11.7/6543R11.7				
PT6542A12.0/6542R12.0				
PT6543A11.1/6543R11.1				
PT6543A11.7/6543R11.7				



PT6543R

Ordering Information

Part Number	Bonnet Style	Application	Container Connection	Service Connection	Filling Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length with Deflector	Pressure Relief Valve Setting (psig)	Pressure Relief Valve Setting (barg)	For Use In Cylinders w/Propane Capacity Up To:**	UL Flow Capacity @ 120% of set pressure SCFM (air)	UL Flow Capacity @ 120% of set pressure CPMS (air)	Ready To Go™
6532A12.0	Standard	ASME*	¾" M. NGT				12.0"	250	17.24	-	1180	0.56	Plugged
6532R12.0	MultiBonnet®		1" M. NGT								1530	0.72	Yes
6542A12.0	Standard												
PT6542A12.0													
6542R12.0													
PT6542R12.0													
6533A10.5	Standard	DOT	¾" M. NGT	F. POL (CGA 510)	1¾" M. ACME	Knurled	10.5"	375	25.86	420 lbs. Propane	-	-	Plugged
6533R10.5	MultiBonnet®												
6533A11.7	Standard												
6533R11.7	MultiBonnet®												
6543A11.1	Standard												
PT6543A11.1													
6543R11.1			MultiBonnet®	Yes									
PT6543R11.1			Plugged										
6543A11.7	Standard		1" M. NGT	11.1"	11.7"	Plugged							
PT6543A11.7							Yes						
6543R11.7							Plugged						
PT6543R11.7							Yes						

** Per CGA Pamphlet S-1.1.

ASME Multivalves® for Vapor Withdrawal 7556R

These compact Multivalves® are especially suited for vapor withdrawal of ASME containers where compact groupings of components are necessary. Separate filler valves and pressure relief valves are required.



PT7556R

PT7556 R Multivalve®

Especially suited for vapor withdrawal of ASME containers where compact groups of components are necessary. Separate filler valves and pressure relief valves are required

Ordering Information

Part Number	Container Connection	Service Connection	Vapor Equalization Connection		Fixed Liquid Level Vent Valve	Dip Tube Length	Ready to Go™
			Connection Size	UL Listed Closing Flow			
7556R12.0	¾" M. NGT	F. POL (CGA 510)	1¼" M. ACME	4200 CFH @ 100 psig (6.89 barg)	Yes	12"***	Plugged
PT7556R12.0							Yes

* Since these Multivalves® have no integral pressure relief valves, they can be used on any ASME container with an independent relief device sufficient for that tank's capacity.

** Other tube lengths available.

Adhesive Warning Label

The following warning information, Part Number 903-500, is included with each shipment of Multivalve® Assemblies to the first purchaser of the product from the factory.

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Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NFPA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.

Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.

Install valves by applying force to wrenching flats only.

Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.

Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.

Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.

Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).

Test excess flow check valve for proper operation before placing into service. See NFPA Bulletin 113 for recommended procedure.

Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.

RegO Filler Valves: To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 3119A, 3120 and 3121 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.

If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.

In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NPGs and others.

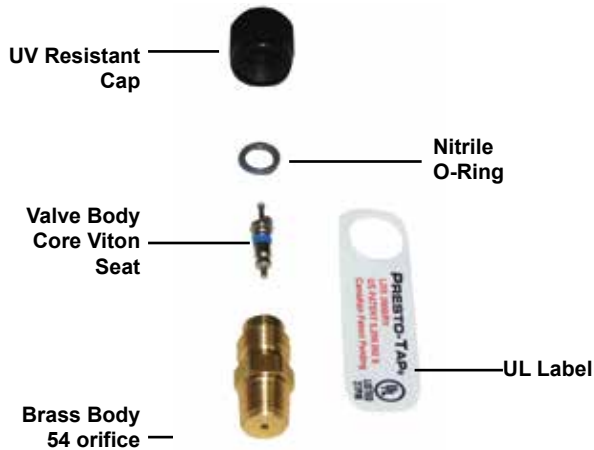
Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.

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REGO Printed in USA 99A-9910-0686
Part number 903-500
 Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

DOT and ASME Multivalves® Info Page

Patented LDS200RV Design Features



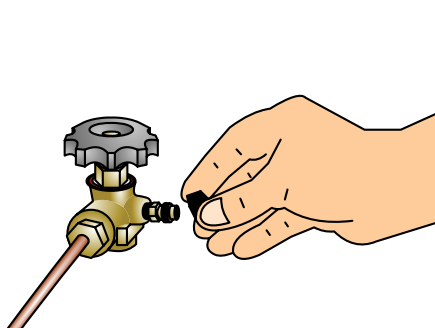
US Patent # 6,209,562

The Patented Presto-Tap LDS200RV pressure fitting is designed to be one of the most cost efficient and simplest methods to quickly and easily perform system pressure checks.

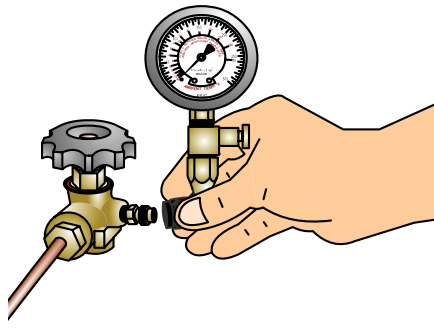
- Patented & UL Listed.
- Provides instant ROI after only one use.
- Will reduce fugitive emissions by up to 90%.
- Can be installed into valves, regulators & appliances.
- Eliminates the need to break the system to perform a leak test.

Presto-Tap System Leak Test Procedure

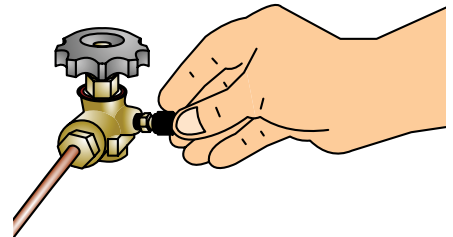
The Presto-Tap fitting installed into the test port located on the downstream side of the service valve is designed to allow quick and easy access when performing a system leak test. It eliminates the need to break the system to install expensive test block apparatus. The following PT9102R series service valve shown here, illustrates how to use the Presto-Tap fitting to perform a high-pressure system leak test. This same procedure applies to the PT7556R, PG8475, PT6542 and PT6543 series valves not shown here that carry the same feature.



1 Remove Gas Tight Cap from pressure fitting.



2 Attach 300 LB Gauge to pressure fitting. Perform System Leak Test Per NFPA 58 - Your Company Policy.



3 Once the system has been leak tested successfully simply remove the 300 LB gauge and replace and snug the Gas Tight Cap.



PG8475RL Series



PT7556 Series



PT9102R Series



PT6543 Series
PT6542 Series

Only trained qualified personnel should perform leak testing. As for any LP-Gas installation, service or repair it is required that time be taken to ensure safety and all federal, state and local regulations are met.

Safety Warning – LP-Gas Pressure Relief Valves

Purpose

In its continuing quest for safety, RegO is publishing safety warning bulletins explaining the hazards associated with the use, misuse and aging of RegO Products. LP-Gas dealer managers and service personnel must realize that the failure to exercise the utmost care and attention in the installation, inspection and maintenance of these products can result in personal injury and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

This Warning Bulletin should be provided to all purchasers of RegO and all personnel using or servicing these products. Additional copies are available from RegO and your Authorized RegO Distributor.

WARNING

What You Must Do:

- **Read This Entire Warning**
- **Install Properly**
- **Inspect Regularly**

Scope

This bulletin applies to pressure relief valves installed on stationary, portable and cargo containers and piping systems utilized with these containers. This bulletin is not intended to be an exhaustive treatment of this subject and does not cover all safety practices that should be followed in the installation and maintenance of LP-Gas systems. Each LP-Gas employee should be provided with a copy of NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspection and Maintenance" as well as the NPGA "LP-Gas Training Guidebooks" relating to this subject.

Warnings should be as brief as possible. If there is a simple warning, it is:

Inspect pressure relief valves regularly. Replace unsafe or suspect valves immediately. Use common sense.

Inspect Regularly

A pressure relief valve discharges when some extraordinary circumstance causes an over pressure condition in the container. If a pressure relief valve is known to have discharged, the relief valve, as well as the entire system, should be immediately and thoroughly inspected to determine the reason for the discharge. In the case of discharge due to fire, the valve should be removed from service and replaced.

Relief valves should be inspected each time the container is filled but no less than once a year. If there is any doubt about the condition of the valve, it must be replaced.

Eye protection must be worn when performing inspection on relief valves under pressure. Never look directly into a relief valve under pressure or place any part of your body where the relief valve discharge could impact it. In some cases a flashlight and a small mirror are suggested to assist when making visual inspections.

To Properly Inspect A Pressure Relief Valve, Check For:

1. **A rain cap.** Check protective cap located in valve or at end of pipeaway for a secure fit. Protective caps help protect the relief valve against possible malfunction caused by rain, sleet, snow, ice, sand, dirt, pebbles, insects, other debris and contamination. **REPLACE DAMAGED OR MISSING CAPS AT ONCE AND KEEP A CAP IN PLACE AT ALL TIMES.**
2. **Open weep holes.** Dirt, ice, paint and other foreign particles can prevent proper drainage from the valve body. **IF THE WEEP HOLES CANNOT BE CLEARED, REPLACE THE VALVE.**
3. **Deterioration and corrosion on relief valve spring.** Exposure to high concentrations of water, salt, industrial pollutants, chemicals and roadway contaminants could cause metal parts to fail. **IF THE COATING ON THE RELIEF VALVE SPRING IS CRACKED OR CHIPPED, REPLACE THE VALVE.**

Replace Pressure Relief Valves In 10 Years Or Less

The safe useful life of pressure relief valves can vary greatly depending on the environment in which they live.

Relief valves are required to function under widely varying conditions. Corrosion, aging of the resilient seat disc and friction all proceed at different rates depending upon the nature of the specific environment and application. Gas impurities, product misuse and improper installations can shorten the safe life of a relief valve.

Predicting the safe useful life of a relief valve obviously is not an exact science. The conditions to which the valve is subjected will vary widely and will determine its useful life. In matters of this kind, only basic guidelines can be suggested. For example, the Compressed Gas Association Pamphlet S-1.1 Pressure Relief Device Standards — Cylinders, section 9.1.1 requires all cylinders used in industrial motor fuel service to have the cylinder's pressure relief valves replaced by new or unused relief valves within twelve years of the date of manufacture of cylinder and within each ten years thereafter. The LP-Gas dealer must observe and determine the safe useful life of relief valves in his territory. The valve manufacturer can only make recommendations for the continuing safety of the industry.

4. **Physical damage.** Ice accumulations and improper installation could cause mechanical damage. **IF THERE ARE ANY INDICATIONS OF DAMAGE, REPLACE THE VALVE.**
5. **Tampering or readjustment.** Pressure relief valves are factory set to discharge at specified pressures. **IF THERE ARE ANY INDICATIONS OF TAMPERING OR READJUSTMENT, REPLACE THE VALVE.**
6. **Seat leakage.** Check for leaks in the seating area using a noncorrosive leak detection solution. **REPLACE THE VALVE IF THERE IS ANY INDICATION OF LEAKAGE.** Never force a relief valve closed and continue to leave it in service. This could result in damage to the valve and possible rupture of the container or piping on which the valve is installed.
7. **Corrosion and contamination. REPLACE THE VALVE IF THERE ARE ANY SIGNS OF CORROSION OR CONTAMINATION ON THE VALVE.**
8. **Moisture, foreign particles or contaminants in the valve.** Foreign material such as paint, tar or ice in relief valve parts can impair the proper functioning of the valves. Grease placed in the valve body may harden over time or collect contaminants, thereby impairing the proper operation of the relief valve. **DO NOT PLACE GREASE IN THE VALVE BODY. REPLACE THE VALVE IF THERE ARE ANY INDICATIONS OF MOISTURE OR FOREIGN MATTER IN THE VALVE.**
9. **Corrosion or leakage at container connection.** Check container to valve connection with a non-corrosive leak detection solution. **REPLACE THE VALVE IF THERE IS ANY INDICATION OF CORROSION OR LEAKAGE AT THE CONNECTION BETWEEN THE VALVE AND CONTAINER.**

CAUTION: Never plug the outlet of a pressure relief valve. Any device used to stop the flow of a properly operating pressure relief valve that is venting an overfilled or overpressurized container - raises serious safety concerns!

WARNING: Under normal conditions, the useful safe service life of a pressure relief valve is 10 years from the original date of manufacture. However, the safe useful life of the valve may be shortened and replacement required in less than 10 years depending on the environment in which the valve lives. Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage.

For Additional Information Read:

1. CGA Pamphlet S-1.1 Pressure Relief Standards - Cylinders, Section 9.1.1.
2. RegO Catalog L-500.
3. RegO Warning # 8545-500.
4. NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspection and Maintenance" and "LP-Gas Training Guidebooks".
5. NFPA # 58, "Storage and Handling of Liquefied Petroleum Gases".
6. NFPA # 59, "LP-Gases at Utility Gas Plants".
7. ANSI K61.1 Safety Requirements for Storage and Handling of Anhydrous Ammonia.

RegO Pressure Relief Valves

Requirements for Pressure Relief Valves

Every container used for storing or hauling LP-Gas and anhydrous ammonia must be protected by a pressure relief valve. These valves must guard against the development of hazardous conditions which might be created by any of the following:

Hydrostatic pressures due to overfilling or the trapping of liquid between two points.

High pressures resulting from exposure of the container to excessive external heat.

High pressures due to the use of incorrect fuel.

High pressures due to improper purging of the container.

Consult NFPA Pamphlet #58 for LP-Gas and ANSI #K61.1 for anhydrous ammonia, and/or any applicable regulations governing the application and use of pressure relief valves.

Operation of Pressure Relief Valves

Pressure relief valves are set and sealed by the manufacturer to function at a specific "start-to-discharge" pressure in accordance with regulations. This set pressure, marked on the relief valve, depends on the design requirement of the container to be protected by the relief valve. If the container pressure reaches the start-to-discharge pressure, the relief valve will open a slight amount as the seat disc begins to move slightly away from the seat. If the pressure continues to rise despite the initial discharge through the relief valve, the seat disc will move to a full open position with a sudden "pop". This sharp popping sound is from which the term "pop-action" is derived.

Whether the relief valve opens a slight amount or pops wide open, it will start to close if the pressure in the container diminishes. After the pressure has decreased sufficiently, the relief valve spring will force the seat disc against the seat tightly enough to prevent any further escape of product. The pressure at which the valve closes tightly is referred to as the "re-seal" or "blow-down" pressure. Generally, the re-seal pressure will be lower than the start-to-discharge pressure. The re-seal pressure can be, and in most cases is, adversely affected by the presence of dirt, rust, scale or other foreign particles lodging between the seat and disc. They interfere with the proper mating of the seat and disc and the pressure in the container will usually have to decrease to a lower pressure before the spring force embeds foreign particles into the resilient seat disc material and seals leak-tight. The degree by which the presence of dirt decreases the re-seal pressure, is, of course, dependent on the size of the interfering particles.

Once particles have been trapped between the disc and seat, the start-to-discharge pressure is also affected. For example, the pressure relief valve will start-to-discharge at some pressure lower than its original start-to-discharge pressure. Again, the pressure at which the valve will start to discharge is dependent on the size of the foreign particles.

In the case of a pressure relief valve that has opened very slightly due to a pressure beyond its start-to-discharge setting, the chances of foreign material lodging between the seat and disc is negligible although the possibility is always present. If the relief valve continues to leak at pressures below its start-to-discharge setting it must be replaced.

Relief valves which have "popped" wide open must also be checked for foreign material lodged between the seat and disc, as well as for proper reseating of the seat and disc. Continued leakage at pressures below the start-to-discharge setting indicate the relief valve must be replaced.

The pressure at which a pressure relief valve will start to discharge should never be judged by the reading of the pressure gauge normally furnished on the container.

The reasons for this are two-fold:

If the relief valve is called upon to open, the resulting discharge produces an increased vaporization of the product in the container with the result that the liquid cools to a certain extent and the vapor pressure drops. A reading taken at this time would obviously not indicate what the pressure was when the relief valve opened.

The pressure gauges usually on most containers provide somewhat approximate readings and are not intended to provide an indication of pressure sufficiently accurate to judge the setting of the relief valve.

Repair and Testing

RegO Pressure Relief Valves are tested and listed by Underwriters Laboratories, Inc., in accordance with NFPA Pamphlet #58. Construction and performance of RegO Pressure Relief Valves are constantly checked at the factory by U.L. inspectors. Therefore, testing of RegO Pressure Relief Valves in the field is not necessary.

Any pressure relief valve which shows evidence of leakage, other improper operation or is suspect as to its performance must be replaced immediately using approved procedures.

Pipe-Away Adapters

Pipe-away adapters are available for most RegO Pressure Relief Valves, where it is required or desirable to pipe the discharge above or away from the container. Each adapter is designed to sever if excessive stress is applied to the vent piping – thus leaving the relief valve fully operative.

Weep hole deflectors are available on larger relief valves. These deflectors provide protection against flame impinging on adjacent containers which could occur from ignition of LP-Gas escaping through the relief valve drain hole when the valve is discharging.

Selection of RegO Pressure Relief Valves For ASME Containers

The rate of discharge required for a given container is determined by the calculation of the surface area of the container as shown in "Chart A" for LP-Gas and "Chart B" for anhydrous ammonia. See page D9.

Setting - The set pressure of a pressure relief valve depends upon the design pressure of the container. Refer to NFPA Pamphlet #58 for more information.

Selection of RegO Pressure Relief Valves for DOT Containers

To determine the proper relief valve required for a given DOT container, refer to the information shown with each pressure relief valve in the catalog. This information will give the maximum size (pounds water capacity) DOT container for which the relief valve has been approved.

Setting - The standard relief valve setting for use on DOT cylinders is 375 psig (25.86 barg).

RegO Pressure Relief Valves

Ordering RegO Pressure Relief Valves

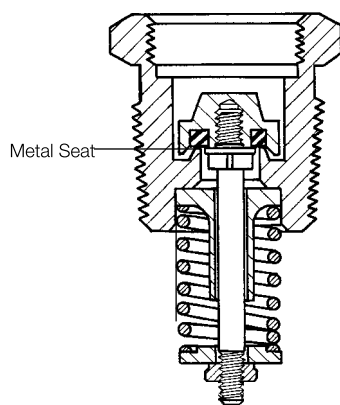
When ordering RegO Pressure Relief Valves, be sure you are certain that it will sufficiently protect the container as specified in the Foreword section, NFPA Pamphlet #58 and any other applicable standards or specifications.

All adapters, protective caps and deflectors must be ordered separately, unless specified otherwise.

Part Number Explanation

Products carrying an "A" or "AA" prefix contain no brass parts and are suitable for NH₃. Hydrostatic relief valves carrying an "SS" prefix are of stainless steel construction and are suitable for use with NH₃. The products are also suitable for use with LP-Gas service except relief valves carrying an "AA" prefix. These are of partial aluminum construction and are listed by U.L. for NH₃ service only.

Safety Information - Relief Valves Don't Last Forever



RegO Relief Valve for lift truck containers

The internal spring is protected from external contamination but the other external parts must be protected with a cap. Circular rubber seat disc ring seats on brass shoulder approximately 3/64" wide.

This article was prepared by the engineers of RegO products, after technical consultation with valve manufacturers and other industry sources. Its purpose is to alert and remind the LP-Gas industry of the importance of proper maintenance of pressure relief valves. It applies most particularly to separate relief valves with emphasis on lift truck and motor fuel containers where the hazards of contamination are greatest.

Since the beginning of our industry, manufacturers of equipment and distributors of LP-Gas have worked diligently to provide a safe environment for employees and consumers. The history of the industry testifies to the success of their efforts.

But the industry has now matured and equipment installed years ago is failing because of age. Every year, additional equipment will fail unless it is replaced. Pressure relief valves are no exception. The valve manufacturers and LP-Gas dealers are naturally concerned about this situation.

Causes of Relief Valve Failure

A relief valve is designed to have a safe useful life of many years, but that life will vary greatly depending on the environment in which it "lives." To attempt to estimate the safe useful life of a relief valve and the effect of environment on its performance, a brief discussion of the materials used and the nature of its performance should be helpful.

Relief valve bodies are generally made of brass or steel. Springs are made from various spring wires which are plated or painted, or made of stainless steel. Valve seat discs are made of synthetic rubber compounds which will remain serviceable in an atmosphere of LP-Gas. Relief valve stems, guides, etc. are generally made from brass or stainless steel.

Relief valves, over the years, may not function properly in several ways:

- They may leak at pressures below the set pressure.
- They may open and fail to properly reseal.
- They may open at higher than the set pressure.

These failures to function properly are due primarily to four "environmental" conditions:

1. Corrosion of metal parts (particularly springs) which result in the component parts failing to perform.
2. Deterioration of the synthetic rubber seat disc material.
3. Clogging or "cementing" of the movable relief valve components so that their movement is restricted.
4. Debris on the valve seat after the relief valve opens, effectively preventing the valve from reseating.

Corrosion is caused by water, corrosive atmospheres of salt and industrial pollutants, chemicals, and roadway contaminants. High concentrations can attack the metal parts vigorously. No suitable metals are totally resistant to such corrosion.

Synthetic rubber and seat disc materials can also be attacked by impurities in the gas and corrosive atmospheres, particularly those with sulphur dioxide. There are no suitable rubber materials which resist all contaminants.

"Cementing" of relief valve parts has been caused by normal industrial atmospheres containing particles of dirt, iron oxide, metal chips, etc. combined with water, oil, or grease. Ice collecting in recessed valves could cause relief valves to fail to open. Paint and tar in relief valves also cause failure to function properly.

Safety Information - Relief Valves

Debris on valve seats which prevents reseating can occur whenever the valve collects material in the relief valve opening which is not blown out when the relief valve opens.

Inspection of Relief Valves

Unfortunately many of the above problems may not be easily observed because of the compact nature of some relief valve designs.

A casual visual inspection of a relief valve may not necessarily disclose a potential hazard. On the other hand, a visual inspection will often disclose leakage, corrosion, damage, plugging and contamination.

If additional light is required, a flashlight should be used.

If there is any doubt about the condition of the valve, or if there is a suspicion that the valve has not been protected by a cap for some time, it should be replaced before refilling the container.

Eye protection must be used when examining relief valves under pressure.

Smaller Relief Valves

The industry's requirement for a small full-flow safety relief valve challenged design engineers some years ago:

The valve must be leakproof before operating and must reseal leakproof each time after each operation. The only known satisfactory seat disc materials to accomplish this have been special synthetic rubber compounds.

- Valve discharge settings are relatively high and require high spring loads to keep the valve closed.
- Because of the small interior diameter of the valve, the round metal seating area is small.

All of these parameters may result in the development of a significant indentation in the rubber seat disc after some years. The seat disc may have a tendency to cling to the metal seat. This may result in the relief valve not opening at the set pressure as the seat disc ages.

Tests have been conducted on small LP-Gas relief valves of all the U.S. valve manufacturers. Valves over 10 years old were removed from service and tested to determine at what pressure the valves discharged. In many of the valves, the pressure required to open the valve exceeded the set pressure.

Because of the critical importance of proper functioning of relief valves, common sense and basic safety practice dictate that small relief valves should be replaced in about 10 years.

Some larger relief valves on bulk storage tanks can be replaced with rebuilt valves obtained from the manufacturers. Small relief valves cannot be rebuilt economically, thus, new valves are required. Most LP-Gas dealers find it impractical and costly to test relief valves and field repairing of relief valves is not sanctioned by the manufacturers, Underwriter's Laboratories, or ASME.

Use of Protective Caps

Many of the problems that cause inoperative relief valves could be prevented if proper protective caps were kept in place at all times.

Collection of debris would be prevented. Contamination caused by corrosive atmospheres would be reduced. Water collection in the valves would be eliminated. Relief valves protected with caps from the time of installation in the container would obviously have a much longer safe useful life, but they still should be replaced at some time because of the gradual deterioration of the rubber seat disc due to age alone.

NFPA 58 requires that protective caps must be kept in place as a protective cover on some relief valves. This is a mandatory requirement on several types of relief valves. The fact that use of caps may make inspection more time consuming should not be viewed as a reason for either not using the caps, or not making required periodic inspections.

In the event a relief valve has been used without the required cap, the relief valve should be thoroughly inspected and the required cap placed on the relief valve. If damage is noted to the relief valve, it should be replaced and the replacement valve should be capped. Relief valves with pipe-away adapters or deflectors used on lift truck containers have been found choked with debris. Inspection of relief valves with deflectors can only be accomplished by removing the deflector.

Similarly, larger relief valves with vent stacks have been found choked with debris and water. Valves have failed because springs rusted through. The weep hole was plugged. It was obvious that the relief valves had not been inspected in many years. These conditions must be alleviated by periodic inspections and replacement of relief valves as needed.

Summary Recommendations

Predicting the safe useful life of a relief valve is obviously not an exact science. The conditions to which the valve is subjected will vary widely and will largely control its life. In matters of this kind, only basic guidelines can be suggested. The LP-Gas dealer must observe and determine the safe useful life of relief valves in his territory. The valve manufacturers can only make recommendations for the continuing safety of the industry:

1. Make sure proper protective caps are in place at all times. Do not release a container for service or fill a container unless it has a protective cap in place.
2. Replace relief valves periodically, at least every 10 years. Every relief valve has the month and year of manufacture stamped on the valve. This is most particularly true of small separate relief valves.
3. Carefully inspect valves each time before the container is filled. Replace valves showing any signs of contamination, corrosion, damage, plugging, leakage, or any other problem. Eye protection must be used when examining relief valves under pressure.

Minimum Required Rate of Discharge for Pressure Relief Valves Used on ASME Containers

Chart A — Minimum Required Rate of Discharge for LP-Gas Pressure Relief Valves Used on ASME Containers

From NFPA Pamphlet #58, Appendix D (1986).

Minimum required rate of discharge in cubic feet per minute of air at 120% of the maximum permitted start-to-discharge pressure for pressure relief valves to be used on containers other than those constructed in accordance with Interstate Commerce Commission specification.

Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air
20 or less	626	0.3	85	2050	0.97	150	3260	1.54	230	4630	2.19	360	6690	3.16	850	13540	6.39	1500	21570	10.18
25	751	0.35	90	2150	1.01	155	3350	1.58	240	4800	2.27	370	6840	3.23	900	14190	6.7	1550	22160	10.46
30	872	0.41	95	2240	1.06	160	3440	1.62	250	4960	2.34	380	7000	3.3	950	14830	7	1600	22740	10.73
35	990	0.47	100	2340	1.1	165	3530	1.67	260	5130	2.42	390	7150	3.37	1000	15470	7.3	1650	23320	11.01
40	1100	0.52	105	2440	1.15	170	3620	1.71	270	5290	2.5	400	7300	3.45	1050	16100	7.6	1700	23900	11.28
45	1220	0.58	110	2530	1.19	175	3700	1.75	280	5450	2.57	450	8040	3.79	1100	16720	7.89	1750	24470	11.55
50	1330	0.63	115	2630	1.24	180	3790	1.79	290	5610	2.65	500	8760	4.13	1150	17350	8.19	1800	25050	11.82
55	1430	0.67	120	2720	1.28	185	3880	1.83	300	5760	2.72	550	9470	4.47	1200	17960	8.48	1850	25620	12.09
60	1540	0.73	125	2810	1.33	190	3960	1.87	310	5920	2.79	600	10170	4.8	1250	18570	8.76	1900	26180	12.36
65	1640	0.77	130	2900	1.37	195	4050	1.91	320	6080	2.87	650	10860	5.13	1300	19180	9.05	1950	26750	12.62
70	1750	0.83	135	2990	1.41	200	4130	1.95	330	6230	2.94	700	11550	5.45	1350	19780	9.34	2000	27310	12.89
75	1850	0.87	140	3080	1.45	210	4300	2.03	340	6390	3.02	750	12220	5.77	1400	20380	9.62			
80	1950	0.92	145	3170	1.5	220	4470	2.11	350	6540	3.09	800	12880	6.08	1450	20980	9.9			

Surface area = Total outside surface area of container in square feet.

When the surface area is not stamped on the name plate or when the marking is not legible, the area can be calculated by using one of the following formulas:

1. Cylindrical container with hemispherical heads. Area (in sq. ft.) = overall length (ft.) x outside diameter (ft.) x 3.1416.
2. Cylindrical container with semi-ellipsoidal heads. Area (in sq. ft.) = overall length (ft.) + .3 outside diameter (ft.) x outside diameter (ft.) x 3.1416.
3. Spherical container. Area (in sq. ft.) = outside diameter (ft.) squared x 3.1416.

Flow Rate SCFM Air = Required flow capacity in cubic feet per minute of air at standard conditions, 60°F. and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2000 square feet, the required flow rate can be calculated using the formula, Flow Rate-SCFM Air = 53.632 A^{0.82} Where A = total outside surface area of the container in square feet.

Chart B — Minimum Required Rate of Discharge for Anhydrous Ammonia Pressure Relief Valves Used on ASME Containers

From ANSI K61.1-1981, Appendix A (1981).

Minimum required rate of discharge in cubic feet per minute of air at 120% of the maximum permitted start-to-discharge pressure for pressure relief valves to be used on containers other than those constructed in accordance with United States Department of Transportation cylinder specifications.

Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Flow Rate CMPS Air
20	258	0.12	95	925	0.44	170	1500	0.71	290	2320	1.09	600	4200	1.98	1350	8160	3.85	2100	11720	5.53
25	310	0.15	100	965	0.46	175	1530	0.72	300	2380	1.12	650	4480	2.11	1400	8410	3.97	2150	11950	5.64
30	360	0.17	105	1010	0.48	180	1570	0.74	310	2450	1.16	700	4760	2.25	1450	8650	4.08	2200	12180	5.75
35	408	0.19	110	1050	0.5	185	1600	0.76	320	2510	1.18	750	5040	2.38	1500	8900	4.2	2250	12400	5.85
40	455	0.21	115	1090	0.51	190	1640	0.77	330	2570	1.21	800	5300	2.5	1550	9140	4.31	2300	12630	5.96
45	501	0.24	120	1120	0.53	195	1670	0.79	340	2640	1.25	850	5590	2.64	1600	9380	4.43	2350	12850	6.06
50	547	0.26	125	1160	0.55	200	1710	0.81	350	2700	1.27	900	5850	2.76	1650	9620	4.54	2400	13080	6.17
55	591	0.28	130	1200	0.57	210	1780	0.84	360	2760	1.3	950	6120	2.89	1700	9860	4.65	2450	13300	6.28
60	635	0.3	135	1240	0.59	220	1850	0.87	370	2830	1.34	1000	6380	3.01	1750	10090	4.76	2500	13520	6.38
65	678	0.32	140	1280	0.6	230	1920	0.91	380	2890	1.36	1050	6640	3.13	1800	10330	4.88			
70	720	0.34	145	1310	0.62	240	1980	0.93	390	2950	1.39	1100	6900	3.26	1850	10560	4.98			
75	762	0.36	150	1350	0.64	250	2050	0.97	400	3010	1.42	1150	7160	3.38	1900	10800	5.14			
80	804	0.38	155	1390	0.66	260	2120	1	450	3320	1.57	1200	7410	3.5	1950	11030	5.21			
85	845	0.4	160	1420	0.67	270	2180	1.03	500	3620	1.71	1250	7660	3.62	2000	11260	5.31			
90	885	0.42	165	1460	0.69	280	2250	1.06	550	3910	1.85	1300	7910	3.73	2050	11490	5.42			

Surface area = Total outside surface area of container in square feet.

When the surface area is not stamped on the name plate or when the marking is not legible, the area can be calculated by using one of the following formulas:

1. Cylindrical container with hemispherical heads. Area (in sq. ft.) = overall length (ft.) x outside diameter (ft.) x 3.1416.
2. Cylindrical container with other than hemispherical heads. Area (in sq. ft.) = overall length (ft.) + .3 outside diameter (ft.) x outside diameter (ft.) x 3.1416.
3. Spherical container. Area (in sq. ft.) = outside diameter (ft.) squared x 3.1416.

Flow Rate SCFM Air = Required flow capacity in cubic feet per minute of air at standard conditions, 60°F. and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2,500 square feet, the required flow rate can be calculated using the formula, Flow Rate-SCFM Air = 22.11 A^{0.82} where A = outside surface area of the container in square feet.

Conversion Factor

$$\begin{aligned} \text{ft}^2 \times 0.092903 &= \text{m}^2 \\ \text{SCFM} \times 0.028317 &= \text{m}^3/\text{min} \\ \text{ft} \times 0.3048 &= \text{m} \end{aligned}$$

"Pop-Action" Pressure Relief Valves

General Information

The "Pop-Action" design permits the RegO Pressure Relief Valve to open slightly to relieve moderately excessive pressure in the container. When pressure increases beyond a predetermined point, the valve is designed to "pop" open to its full discharge capacity, reducing excess pressure quickly. This is a distinct advantage over ordinary valves which open gradually over their entire range, allowing excessive pressure to develop before the relief valve is fully open. All RegO internal, semi-internal, and external relief valves incorporate this "Pop-Action" design.

Relief Valves in this catalog are only intended for use in LP-Gas or anhydrous ammonia service. Do not use any other service commodity. If you have an application other than conventional LP-Gas or anhydrous ammonia service, contact RegO before proceeding.

Fully Internal "Pop-Action" Pressure Relief Valves for Transports and Bobtail Delivery Vehicles A8434 and A8436 Series

Designed specifically for use as a primary relief valve on ASME cargo tanks for transportation and bobtails with 2" and 3" F.NPT couplings.



A8434-SERIES

Ordering Information

Part Number	Start To Discharge Setting PSIG	A Container Connection	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	Flow Capacity SCFM/Air		LP-Gas	NH3	Propylene	Protective Cap (Included)
					UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)				
A8434G	250	2" M. NPT	9 1/16"	1 1/2"	3700	3456	Yes	Yes	No	A8434-11B
A8434N	265					3659				A8436-11B
A8436G	250	3" M. NPT	21.951"	3 1/4"	10210	9598				
A8436N	265					9839				
VA8436G	250				-	9596		No	Yes	
VA8436N	265					9839				

* Per NFPA Pamphlet #58, Appendix D. Area shown is for UL or ASME flow rating—whichever is larger.

Semi-Internal "Pop-Action" Pressure Relief Valves for ASME Portable Containers 7583, 8684 and 8685 Series

Designed for use as a primary relief valve on ASME containers such as 250, 500 and 1,000 gallon tanks. Underwriters' Laboratories lists containers systems on which these types of valves are mounted outside the hood without additional protection, if mounted near the hood and fitted with a protective cap.



7583G

Ordering Information

Part Number	Start To Discharge Setting psig	Start To Discharge Setting barg	A Container Connection M. NPT	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	D Wrench Hex Section	Flow Capacity SCFM, CPMS/Air				Protective Cap (Included)
							UL (At 120% of Set Pressure) SCFM	UL (At 120% of Set Pressure) CPMS	ASME (At 120% of Set Pressure) SCFM	ASME (At 120% of Set Pressure) CPMS	
7583G	250	17.24	3/4" 3/8"	8 " 7/16"	1 " 1/8"	1 3/4"	1980	0.93	1806	0.85	7583-40X
8684G			1" 3/8"	9 " 5/8"	1 " 7/8"	1 "	2620	1.24	2565	1.21	8684-40
8685G			1 1/4" 1/2"	11 " 1/2"	1 " 3/4"	2 "	4385	2.07	4035	1.9	7585-40X

Fully Internal “Pop-Action” Pressure Relief Valves for Motor Fuel Containers 8543, 8544 and 8546 Series

8543 Series relief valves are designed for use as a primary relief valve in larger ASME motor fuel containers such as on buses, RV's, trucks and construction equipment.

8544 Series relief valves are designed for use as a primary relief valve in smaller ASME and DOT motor fuel containers such as on tractors, lift trucks, cars and taxicabs.



8546-11 3/4"



7544-11A 1"



7543-10 1 1/4"



8544

Ordering Information

Part Number	Container Type	Start To Discharge Setting psig	Start To Discharge Setting barg	A Container Connection M. NPT	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	D Hex Wrenching Section	Flow Capacity SCFM, CPMS/Air****				Protective Cap (Included)	Accessories
								UL (At 120% of Set Pressure) SCFM	UL (At 120% of Set Pressure) CPMS	ASME (At 120% of Set Pressure) SCFM	ASME (At 120% of Set Pressure) CPMS		Pipeaway Adapter
8546G	ASME	250	17.24	3/4"	4 1/2"	15/16"	1 1/16"	723	0.34	651	0.31	11565-26	8546-11
8544G				1"	5 7/16"	7/8"	1 5/16"	1020	0.48	936	0.44	7544-41G	7544-11A*
8543G				1 1/4"			1 11/16"	1465	0.69	1400	0.66	3131-41	7543-10**
8546T		312	21.52	3/4"	4 1/2"	15/16"	1 1/16"	880	0.42	792	0.37	11565-26	8546-11
8544T				1"			1 5/16"	1282	0.61	1158	0.55	7544-41	7544-11A
8543T				1 1/4"			1 11/16"	1990	0.94	1731	0.82	3131-41	7543-10**
8544A375T	DOT	375	25.86	1"	5 7/16"	7/8"	1 5/16"	NA	NA	1384	0.65	7544-41G	7544-11A
8544K								1545***	0.73***	NA	NA	7544-41	7544-11A

* 1" M. NPT outlet connection.

** 1 1/4" M. NPT outlet connection.

*** Rating also applies to DOT requirements.

**** Flow rates shown are for bare relief valves. Adapters and pipeaway will reduce flow as discussed in the Foreword section.

Fully Internal “Pop-Action” Pressure Relief Valve for DOT Fork Lift Cylinders 8545AK

Designed specifically for use as a primary relief valve on forklift cylinders, the 8545AK reduces the possibility of improper functioning of the relief mechanism due to foreign material build up. All guides, springs, stem and adjusting components are located inside the cylinder - removed from the direct exposure of foreign materials and debris from the atmosphere.

NFPA Pamphlet #58 requires that:

“All containers used in industrial truck (including forklift truck cylinders) service shall have the container pressure relief valve replaced by a new or unused valve within 12 years of the date of manufacture of the container and each 10 years thereafter.”



7545-12 90° Adapter



7545-14 45° Adapter



8545AK

Ordering Information

Part Number	Container Type	Start To Discharge Setting psig	Start To Discharge Setting barg	Container Connection M. NPT	Flow Capacity SCFM, CPMS/Air**		Accessories (Order Separately)		
					(RegO Rated at 480 psig (33.09 barg) SCFM)	(RegO Rated at 480 psig (33.09 barg) CPMS)	Protective Cap	Deflectors***	
8545AK	Dot	375	25.86	3/4"	400*	0.19	11557-19	45° Elbow	7545-12

* Classified by U.L. in accordance with Compressed Gas Association Pamphlet S-1.1 Pressure Device Standards for Cylinders. Meets requirements for use on DOT containers with 262 pounds or less weight of water or 109 pounds or less of LP-Gas.

** Flow rates are shown for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

*** Order protective cap #9103-54 or 7545-40.

Semi-Internal "Pop-Action" Pressure Relief Valves for Large Storage Containers

Designed especially for use as a primary relief valve on large stationary storage containers, these low profile relief valves are generally mounted in half couplings. However, they are designed so that the inlet ports clear the bottom of a full 2" coupling. This ensures that the relief valve should always be capable of maximum flow under emergency conditions.



7534

Ordering Information

Part Number	Start To Discharge Setting psig	Start To Discharge Setting barg	Container Connection M. NPT	Flow Capacity SCFM, CPMS/Air*				Accessories	
				UL (At 120% of Set Pressure) SCFM	UL (At 120% of Set Pressure) CPMS	ASME (At 120% of Set Pressure) SCFM	ASME (At 120% of Set Pressure) CPMS	Protective Cap	Pipeaway Adapter
7534B	125	8.62	2"	6,025	2.84	-	-	7534-40X	7534-20**
7534G***	250	17.24		11,675	5.51	10,422	4.92		

* Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

** 3" F. NPT outlet connection.

*** Other seat materials are available.

External "Pop-Action" Pressure Relief Valves for ASME Containers and Bulk Plant Installations AA3126, AA3130, 3131, 3132, 3133, 3135, AA3135, and A3149 Series

Designed for use as a primary relief valve on ASME above ground and underground containers, bulk plant installations and skid tanks. The 3131 Series may also be used as a primary or secondary relief valve on DOT cylinders, or as a hydrostatic relief valve. All working components of these relief valves are outside the container connection, so the valves must be protected from physical damage.



3135-10



3132-10



3135



A3149



AA3135



W3132G

Ordering Information

Part Number	Start To Discharge Setting psig	Start To Discharge Setting barg	A Container Connection M. NPT	B Overall Height (Approx.)	C Wrench Hex Section	Flow Capacity SCFM, CPMS/Air (a)				Accessories				
						UL (At 120% of Set Pressure) SCFM	UL (At 120% of Set Pressure) CPMS	ASME (At 120% of Set Pressure) SCFM	ASME (At 120% of Set Pressure) CPMS	Protective Cap	Pipeaway Adapter		Weep Hole Deflector	
											Part Number	Outlet Size		
AA3126L030	30	2.07	½"	2⅞"	⅞"	(b)	(b)	-	-	9103-54	AA3126-10	½" M. NPT	-	
A3149L055	55	3.79	2½"	10½"	4⅞"	2608 (c)	1.23 (c)	-	-	3149-40	(h)		Included (j)	
A3149L200	200	13.79				8770 (c)	4.14 (c)	-	-		(h)			
AA3126L250	250	17.24	½"	2⅞"	⅞"	277 (c)	0.13 (c)	-	-	9103-54	AA3126-10	½" M. NPT	3133-11	
3131G			¾"	3 ⅙"	1¼"	2060	0.97	1939	0.92	3131-41 (g)	-	-		
AA3130UA250						2045	0.97	1838	0.87	11557-110	AA3131-10	1" F. NPT		
W3132G			1"	6 ⅙"	2⅝"	3340	1.58	-	-	3132-54 (g)	3132-10	1¼" F. NPT		
3132G			1¼"			4130	1.95	-	-		-	-		
T3132G						3790	1.79	-	-		3132-10	1¼" F. NPT		
MV3132G						3995	1.89	-	-		-	-		
3135G			5 ⅜"	2 ⅜"	5770	2.72	-	-	3135-54 (g)	3135-10	2" F. NPT			
AA3135UA250			6 ⅙"		6430	3.03	6341	2.99	AA3135-40PR	AA3135-10				
3133G			1½"	5 ⅙"	3⅝"	6080	2.87	-	-	3133-54 (g)	3133-10	(h)	Included (j)	
A3149MG			2½"	10½"	4⅞"	10390	4.9	-	-	3149-40	(h)			
A3149G								9153	4.32					
AA3130UA265	265	18.27	¾"	3 ⅞"	1¾"	2125	1	1912	0.9	11557-110	AA3131-10	1" F. NPT	-	
AA3135UA265			1¼"	6 ⅙"	2 ⅜"	6615	3.12	6703	3.1	AA3135-40PR	AA3135-10	2" F. NPT	3133-11	
AA3126L312	312	21.51	½"	2⅞"	⅞"	330 (c)	0.16 (c)	-	-	9103-54	AA3126-10	½" M. NPT	-	

(a) Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

(b) Not UL or ASME rated. .059 square inch effective area.

(c) Not UL or ASME rated. RegO rated at 120% of set pressure.

(g) Cap supplied with chain.

(h) Outlet 3 1/2-BN (F) thread, will accept 3" M. NPT pipe thread.

(j) Weep hole deflector is Part No. A3134-11B.

External "Pop-Action" Supplementary Pressure Relief Valves for Small ASME Containers and DOT Cylinders 3127 and 3129 Series

Designed for use as a supplementary relief valve on small ASME above ground and underground containers. They may also be used as a primary or secondary relief device on DOT cylinders, or as hydrostatic relief valves.

All working components of these relief valves are outside the container connection, so the valves must be protected from physical damage.



3129-10 Pipe Away Adapter



3127 Series

Ordering Information

Part Number	Container Type	Start To Discharge Setting psig	Start To Discharge Setting barg	A Container Connection M. NPT	B Overall Height (Approx.)	C Wrench Hex Section	Flow Capacity SCFM, CPM/Air				Suitable for Tanks w/ Surface Area Up To*	Accessories	
							UL (At 120% of Set Pressure) SCFM	UL (At 120% of Set Pressure) CPMS	RegO Rated at 480 psig*** (33.09 barg) SCFM	RegO Rated at 480 psig*** (33.09 barg) CPMS		Protective Cap	Pipeaway Adapter
3127G	ASME	250	17.24	1/4"	1 3/32"	7/8"	295	0.14	-	-	-	9103-54	-
3129G				1/2"	2 1/32"	1 1/8"	465	0.22				3129-40P	3129-10 1/2" F. NPT
3127K	DOT	375	25.86	1/4"	1 3/32"	7/8"	-	-	450	0.21	100 lbs./Propane	9103-54	-
3129K				1/2"	2 1/32"	1 1/8"			780	0.37	200 lbs./Propane	3129-40P	3129-10 1/2" F. NPT

* Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in the Foreword section.

** Not UL or ASME rated. RegO rated at 480 psig (33.09 barg).

*** Meets DOT requirements.

External Hydrostatic Relief Valves

3125, 3127, 3129, SS8001, SS8002, SS8021 and SS8022 Series

Designed especially for the protection of piping and shut-off valves where there is a possibility of trapping liquid LP-Gas or anhydrous ammonia. They may be installed in pipelines and hoses located between shut-off valves or in the side boss of RegO shut-off valves.



Ordering Information

Part Number	Start To Discharge Setting psig	Start To Discharge Setting barg	Valve Body Material	Container Connection M. NPT	Height (Approx.)	Wrench Hex Section	Accessories			
							Protective Cap	Pipeaway		
								Adapter or Threads		
SS8001G	250	17.24	Stainless Steel	1/4"	7/8"	11/16"	-	-		
SS8002G				1/2"		7/8"				
SS8021G				1/4"		11/16"		1/4" NPSM Thrds		
SS8022G				1/2"		7/8"		3/8" NPT Thrds		
3127G			275	18.96	Brass	1/4"	1 31/32"	7/8"	9103-54	-
3129G	1/2"	2 19/32"				1 1/8"	3129-40P	3129-10*		
3127H	1/4"	1 31/32"				7/8"	9103-54	-		
3129H	1/2"	2 19/32"				1 1/8"	3129-40P	3129-10*		
3127P	300	20.68			Brass	1/4"	1 31/32"	1 1/8"	9103-54	-
3129P			1/2"	2 19/32"		1 1/8"	3129-40P	3129-10*		
SS8022P			Stainless Steel	1/2"		1 3/8"	7/8"	-	3/8" NPT Thrds	
3127J			350	24.13		Brass	1/4"	1 31/32"	7/8"	9103-54
3129J					1/2"		2 19/32"	1 1/8"	3129-40P	3129-10*
SS8001J	Stainless Steel	1/4"			7/8"	11/16"	-	-		
SS8002J		1/2"				7/8"				
SS8021J		1/4"	11/16"	1/4" NPSM Thrds						
SS8022J		1/2"	7/8"	3/8" NPT Thrds						
3127K	375	25.86	Brass	1/4"	1 31/32"	7/8"	9103-54	-		
3129K				1/2"	2 19/32"	1 1/8"	3129-40P	3129-10*		
3125L				400	27.58	Brass	1 9/16"	5/8"	3125-40P	-
3127L							1/4"	1 31/32"	7/8"	9103-54
3129L			1/2"				2 19/32"	1 1/8"	3129-40P	3129-10*
SS8001L	400	27.58	Stainless Steel	1/4"	7/8"		11/16"	-	-	
SS8002L				1/2"		7/8"				
SS8021L				1/4"		11/16"	1/4" NPSM Thrds			
SS8022L				1/2"		7/8"	3/8" NPT Thrds			
3127U	450	31.03	Brass	1/4"	1 31/32"	7/8"	9103-54	-		
3129U				1/2"	2 19/32"	1 1/8"	3129-40P	3129-10*		
SS8001U			Stainless Steel	1/4"	7/8"	11/16"	-	-		
SS8002U				1/2"		7/8"				
SS8021U				1/4"		11/16"		1/4" NPSM Thrds		
SS8022U	1/2"	7/8"		3/8" NPT Thrds						

* 1/2" F. NPT outlet connection.



3125 Series (.161 Orifice)
3127 Series (.274 Orifice)
3129 Series (.386 Orifice)



SS8022G

DuoPort® Pressure Relief Valve Manifolds for Small Storage Containers 8542 Series

Designed especially for use as a primary relief device on smaller stationary storage containers, with 2" NPT threaded couplings. These manifolds allow servicing or replacement of either of the two relief valves without evacuating the container or loss of service. The operating lever selectively closes off the entrance port to the relief valve being removed while the remaining valve provides protection for the container and its contents. The rating of each manifold is based on actual flow through the manifold and a single pressure relief valve, taking friction loss into account. It is not merely the rating of the relief valve alone.



8542

Ordering Information

Part Number	Start to Discharge Setting psig	Start to Discharge Setting barg	Application		Container Connection M. NPT	Relief Valve Included				Flow Capacity SCFM, CPMS/Air** (at 120% of set pressure)			
			LP-Gas	NH ₃		Quantity	Part Number	Inlet Connection M. NPT	Accessories	UL Rating (at 120% of set Pressure) SCFM	UL Rating (at 120% of set Pressure) CPMS	ASME Rating (at 120% of set Pressure) SCFM	ASME Rating (at 120% of set Pressure) CPMS
									Pipeaway Adaptors				
8542G	250	17.24	Yes	No	2"	2	3135MG	1¼"	3135-10*	5250 (1)	2.48	NA	NA
8542AG										NA	NA	5549 (1)	2.62
AA8542UA250	265	18.27	No	Yes			AA3135MUA250		AA3135-	6430 (1)	3.03	6341 (1)	2.99
AA8542UA265							10*		6615 (1)	3.12	6703 (1)	3.16	

* 2" F. NPT outlet connection.

** Flow rating based on number of relief valves indicated in parenthesis (). Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow rates as discussed in the Foreword section.

Delta Port Relief Valve Manifolds 8530/AA8530 Series

Designed especially for use as a primary relief device on large stationary pressurized storage containers, the base is supplied with a two-inch NPT threaded container connection. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The hand-wheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.



8533AG

Ordering Information

Part Number	Start to Discharge Setting psig	Start to Discharge Setting barg	Application		Container Connection M.NPTF	Relief Valve				ASME Flow Rating SCFM (air) @ 120% of Set Pressure *	ASME Flow Rating CPMS (air) @ 120% of Set Pressure *
			LPG	NH3		Qty.	Part Number	Inlet Connection M.NPT	Accessories		
									Pipe-away Adapter**		
8532AG	250	17.24	Yes	No	2"	2	3135MG	1 1/4"	3135-10	5,345 (1)	2.62 (1)
8533AG						3				0,640 (2)	5.24 (2)
AA8532MA250			No	Yes		2	AA3135MA250		AA3135-10	6,058 (1)	2.99 (1)
AA8533MA250						3				12,116 (2)	5.99 (2)
AA8532MA265	265	18.27				2	AA3135MA265			6,404 (1)	3.12 (1)
AA8533MA265						3				12 808 (1)	6.24 (2)

* Flow rating based on number of relief valves indicated in parentheses ().

Flow rates shown are for bare relief valves. Adapters and pipe-always will reduce flow rates as discussed in forwarding information in L-500 catalog. ** 2" F. NPT outlet connection

Multiport® Pressure Relief Valve Manifold Assemblies for Large Storage Containers A8560, A8570 and AA8570 Series

Designed especially for use as a primary relief device on large stationary pressurized storage containers with flanged openings. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The handwheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.



**A8560
A8570**

Bolt Stud and Nut Assemblies

Part Number	Consists of	For Use With:	For Connection To:	Number Required
7560-55	1-Bolt Stud and Nut	All RegO Multiports™	Modified 3" - 300# and 4"-ANSI 300# Welding Neck Flange	8
7560-56			Manifold Cover Plate	

Ordering Information

Part Number	Start To Discharge Setting psig	Start To Discharge Setting barg	Application		Container Flange Connection	Relief Valve				Flow Capacity SCFM, CPMS/Air** At 120% of Set Pressure			
			LP-Gas	NH3		Quantity	Part Number	Inlet Connection M. NPT	Accessories Pipeaway Adapters	UL Rating SCFM	UL Rating CPMS	ASME Rating SCFM	ASME Rating CPMS
A8563G	250	17.24	Yes	Yes	3"-300#*	3	A3149MG	2½"	****	18,500 (2)	8.73	Not Applicable	Not Applicable
A8564G						4				27,750 (3)	13.1		
A8573G					4"-300#	3				18,500 (2)	8.73		
A8574G						4				27,750 (3)	13.1		
A8563AG					3"-300#*	3	A3149G			Not Applicable	Not Applicable	18,300 (2)	8.64
A8564AG						4						27,400 (3)	12.93
A8573AG					4"-300#	3						18,300 (2)	8.64
A8574AG						4						27,400 (3)	12.93

* For use with modified 300# ANSI flange with 4" port.

** Flow rating based on number of relief valves indicated in parentheses (). Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow rates as discussed in the Foreword section.

*** 2" F. NPT outlet connection.

**** Outlet 3½-8N (F) thread, will accept 3" M. NPT pipe thread.

Adhesive Warning Label

The following warning information, Part Number 8545-500, is included with each shipment of pressure relief valves and relief valve manifolds to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

DANGER

READ THIS FIRST

WARNING

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS, **EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Make sure you are thoroughly trained before you attempt any pressure relief installation or maintenance. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warning "Pressure Relief Valves" found in the relief valve section of the L-500 & L-102 Catalogs. Follow its recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment. Flow rates in the charts are for bare relief valves found in the relief valve section of the L500 & L102 Catalogs. The addition of defectors, pipeway adapters and piping will restrict the flow. To properly protect any container, the total system flow must be sufficient to relieve pressure at the pressure setting of the relief valve in accordance with all applicable codes.

Use only RegO adapters on RegO relief valves. Adapters not designed specifically for piping away RegO relief valves, such as those with 90° turns or reduced internal diameters, will decrease flow dramatically. These should never be used as they can cause the relief valve to chatter and eventually destroy itself.

Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.

Install valves by applying force to wrenching flats only.

Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.

Check for damage after valve installation. Check that the pressure relief valve is clean and free of foreign material. Make sure protective cap is properly in place.

Check that there are no leaks with a non-corrosive leak detection solution before filling with LP-Gas.

Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure.)

In selecting a label for posting at the installation site, consider RegO part number 901-400 along with your own, NPGA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warning "Pressure Relief Valves" found in the relief valve section of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.

REGO

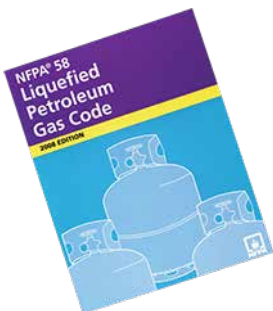
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8545-500

LP-Gas Hose-End Filling Valves (With ACME Connectors)

Safety Warnings



Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures. Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

Nature of Warnings

It is recognized that warnings should be as brief as possible, but factors involved in filler valve and filling valves failure are not simple. They need to be fully understood so that proper procedures and maintenance can be used to prevent accidents. If there is a simple warning, it would be:

**Loosen filling valve from filler valve very slowly.
If there is a leak, know procedure to follow.**

This bulletin is not intended to be an exhaustive treatment of the subject of filler valves and certainly does not cover all safety practices that should be followed in the installation, operation and maintenance of LP-Gas systems, which include filler and filling valves.

Hose-End Filling Valves With ACME Connectors

Hose-end valves must never be dragged over the ground or dropped or banged into the truck when the hose is reeled in.

They could open accidentally or they could be damaged. Dragging will cause abnormal wear and eventual valve failure. Foreign material will lodge in the connector which can cause failure of the filler valve.

To prevent hazardous conditions, operators should follow this procedure on every filling application:

Always wear gloves and eye protection.

Check for foreign material in hose-end valve and the filler valve, and if present, remove with extreme care. If material cannot be safely removed, do not proceed with filling and replace valve.

Make sure the ACME connector spins on easily by hand.

If leak is noticed when filling is started, stop the operation and correct the leaking condition.

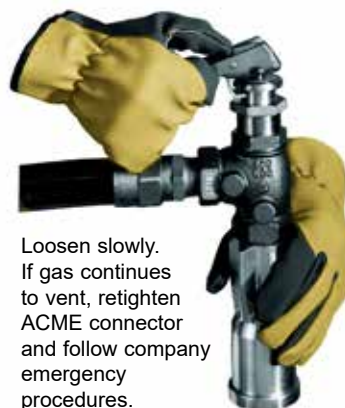
After filling, bleed the gas trapped between the filler valve and hose-end valve by using the vent on the hose-end valve or by slightly loosening coupling nut to vent the gas before disconnecting.

If gas does not stop venting, then filler valve or hose-end valve is leaking. Do not disconnect filling connector. This is a hazardous situation and your company procedure for handling this problem must be carefully followed.

Make sure your company has such a procedure. Inspection of Filling Valves with Handwheel

Valves should be inspected at least once a month to be sure that the valve handle is tight and not damaged, that the stem is not bent and that there is no "play" in the threads in the bonnet. "Play" will normally not be noticed if the valve is under pressure.

The ACME threads should be examined for wear, dents or nicks and the seating area should be clean and smooth.



Loosen slowly.
If gas continues
to vent, retighten
ACME connector
and follow company
emergency
procedures.

Inspection of Quick Acting Filling Valves

Valves should be inspected daily to make sure locking mechanism functions properly.

The ACME threads should be examined for wear, dents or nicks and the seating area should be clean and smooth.

The retaining ring on the filler connection should be examined to make sure it is properly holding the female ACME rotating nut or handle so as to keep the surface that seats on the filler valve gasket protected.

If any problems are evident, valves should be immediately replaced or repaired.

Larger Filler and Filling Valves

For 2¼" and 3¼" valves with ACME connections, use only the special wrenches designed for the purpose.

Do not use pipe wrenches or hammers to tighten the connections. All of the previous warnings about the smaller valves also apply here.

General Warning

All RegO products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging components made of materials such as rubber and metal. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential. Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a filler valve or a filling valve is used beyond its safe service life. Life of these valves is determined by the environment in which they "live." The LP-Gas dealer knows better than anyone what this environment is. Note: There is a developing trend in state legislation and in proposed national legislation to make the owner of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of the legislation which could affect them.

Quick-Acting Minimum Loss Hose-End Valves for Bobtail Delivery Trucks and Dispensing Stations A7793A and A7797A

Designed to vastly reduce the amount of product vented when disconnecting bobtail delivery trucks, dispensing systems and anhydrous ammonia nurse tanks. These valves provide instant, full-on flow at the flip of a handle. Shut-off is instant and the handle locks for added protection. This "top of the line" hose-end valve is a fully contained unit that does not require additional filling adapters or connectors.



A7793

Ordering Information

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. ACME)	Locking Handle	Flow at 1 psig (0.07 barg)(Cv) Pressure Drop* (GPM/Propane)	Flow at 1 psig (0.07 barg) (Cv) Pressure Drop* (LPM/Propane)
A7793A	3/4"	1 3/4"	Yes	16.0	60.6
A7797A	1"	1 3/4"	Yes	16.0	60.6

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: A7797 @ 9 psig (0.62 barg) = 16.0 x √9 = 48.0 GPM (181.7 LPM)/propane. For NH₃ flow, multiply propane flow by .90.

Quick-Acting Hose-End Valves for Bobtail Delivery Trucks and Dispensing Stations A7707L and A7708L

Designed especially for safe operator handling of LP-Gas in bobtail delivery truck, dispensing systems and anhydrous ammonia nurse tank service.

These valves provide instant, full-on flow at the flip of the handle and provide instant positive shut-off with a handle lock for added protection.



A7707L

A7708L

Ordering Information

Part Number	Body Design	Inlet & Outlet Connection (F. NPT)	Locking Handle	Flow at 1 psig (0.07 barg) Pressure Drop (Cv) (GPM/Propane)**	Flow at 1 psig (0.07 barg) Pressure Drop (Cv) (LPM/Propane)**	Accessories		
						Filling Connectors**		
						Extended	Compact	
						Steel	Brass	Steel
A7707L	Straight	1"	Yes	18.0	68.1	A7575L4	3175A	A3175A
A7708L	Angle			22.0	83.3			

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: A7708L @ 9 psig (0.62 barg) = 22.0 x √9 = 66.0 GPM (249.8 LPM)/propane. For NH₃ flow, multiply propane flow by .90.

** See appropriate catalog section for additional information.

New 2" ACME Low Emission Hose End Valve for Loading Bobtails and Transports A7914A

The A7914A Low Emission valve is designed to reduce the amount of product vented when disconnecting bobtail and transport loading hoses. This valve provides a full-on flow when pressing the release trigger and the lifting of an easy grip handle. Lowering the handle will immediately stop flow and lock the lever in the closed position. This valve can be used with any standard 3/4" Male ACME connector, or our 6588LE and 6589LE minimum loss filler valves.



A7914A

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Locking Handle	Flow at (Cv) Pressure Drop GPM Propane	
				1 psig (0.07 barg)	10 psig (0.69 barg)
A7914A	2" F.NPT	3/4" F.Acme	Yes	55	174

*To obtain approximate flow at other than 1 psig (0.07 barg) drop, multiply flow in table by square root of pressure drop. Example A7914 @ 9PSIG (0.62 barg) drop = 55 X √9 = 165 GPM /propane

Quick-Acting Valves for Crop Driers and Charging Manifold Hoses 7554 Series

7554S Series valves provide instant shut-off and fast opening control on LP-Gas crop driers. They are also ideal for charging manifold hoses, stationary fuel transfer hoses and other applications requiring quick, positive shut-off. They are not for use with delivery truck hoses because the handle could snag on the ground and open the valve as the hose is reeled back to the truck.

7554L Series valves feature a locking handle device to help prevent accidental opening of the valve. It is ideal for all the same applications as the 7554S Series and may be used on delivery trucks as it incorporates the locking handle design.

Both valve series must be installed so that flow through the valve is opposite to that of a conventional globe valve. This allows the inlet flow to assist in closing the valve and prevents the valve from being opened by high pump pressures.



7554S



7554LV

Ordering Information

Part Number	Inlet & Outlet Connection (F. NPT)	Locking Handle	Flow At 1 psig (0.07 barg) (Cv) Pressure Drop* (GPM/Propane)	Flow At 1 psig (0.07 barg) (Cv) Pressure Drop* (LPM/Propane)
7554SAV	1/2"	No	7.3	27.6
7554LAV		Yes		
7554SV	3/4"	No	11.3	42.8
7554LV		Yes		

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: 7554LV @ 9 psig (0.62 barg) = 11.5 X $\sqrt{9}$ = 34.5 GPM (130.6 LPM)/propane.

Quick-Acting Valves for Cylinder Charging Hoses 7053T and 7901T Series

Designed primarily for use on cylinder charging hoses to provide fast, convenient shut-off and fast opening.

These valves must be installed so that flow through the valve is in the opposite direction to that of a conventional globe valve. This allows the inlet flow to assist in closing the valve, and even more important, helps prevent the valve from being forced open by high pump pressure.



7901T

Ordering Information

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. NPT)	Body Material	Flow At 1 psig (0.07 barg) (CV) Pressure Drop* (GPM/Propane)	Flow At 1 psig (0.07 barg) (CV) Pressure Drop* (LPM/Propane)
7901T	1/4"	1/4"	Brass	1.95	7.4
7901TA	3/8"	3/8"			
7901TB	1/2"	1/4"			
7901TC		1/2"			
7053T		1/2"			

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: 7901T @ 9 psig (0.62 barg) = 1.95 x $\sqrt{9}$ = 5.85 GPM (22.1 LPM)/propane. For NH3 flow, multiply propane flow by .90.

Quick-Acting Valves for Dispensing Hoses 7901TL Series

Designed primarily for use on dispensing hoses to provide safe, convenient shut-off and fast opening. These valves feature a locking handle device to help prevent accidental opening of the valve.



7901TL Series

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. NPT)	Body Material	Flow At 1 psig (0.07 barg) (CV) Pressure Drop* (GPM/Propane)	Flow At 1 psig (0.07 barg) (CV) Pressure Drop* (LPM/Propane)
7901TLA	3/8"	3/8"	Brass	1.95	7.4
7901TLB	1/2"	1/4"			
7901TLC		1/2"			

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: 7901T @ 9 psig (0.62 barg) = 1.95 x $\sqrt{9}$ = 5.85 GPM/propane. For NH3 flow, multiply propane flow by .90.

"V"-Ring Seal Globe and Angle Valve Information

General Information

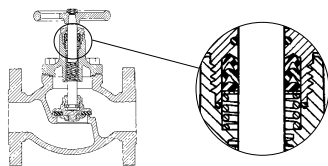
RegO Globe and Angle Valves are designed and manufactured especially to meet the rigid requirements of the LP-Gas industry. The high quality construction and wide variety of sizes and styles also make them highly suited to many other industries such as anhydrous ammonia, chemical and petrochemical.

These ductile iron valves are available in both threaded and flanged connections. Threaded connections are available in ½" F. NPT to 3" F. NPT sizes. Flanged connections are available in 1½", 2" and 3" pipe sizes.

The ductile iron used in these valves has a 60,000 psig (4136 barg) tensile strength which closely approaches that of steel castings. Its yield strength of 45,000 psig (3102.64 barg) and elongation of 15% is also comparable to that of steel castings. These material features ensure the ability of the valve body to withstand impact, wrenching stresses and thermal shock. This ductile iron conforms to ASTM specification A395.

RegO globe and angle valves are designed for working pressures up to 400 psig (27.57 barg) WOG and for operating temperatures from -40° F. to +160° F.

"V"-Ring Stem Seal



The "V"-ring spring-loaded pressure seal used in these RegO globe and angle valves is the most effective stem seal yet developed. It should not be confused with conventional valve stem packing where the seal is obtained by compressing the packing around the stem by means of a packing gland with resultant hard operation and frequent packing replacement.

The wax like surface of the teflon "V"-ring seal and consequent low friction ensures leak-tight performance for an indefinite period where periodic retightening of the packing is not required and the seal provides extra long service life.

In the RegO "V"-ring design, the seal is effected by the pressure expanding the "V"-shape of the seal, forcing it against the stem and bonnet surfaces to prevent leakage. The higher the pressure within the valve, the more effective the seal becomes. A spring loaded washer under the "V"-rings keeps them in an expanded position to ensure an effective seal under low pressure conditions. A wiper ring, located above the seal, keeps the seal free from grit, and/or other foreign material that may hamper operation.

Installation and Operation Note

Containers and pipe lines should be thoroughly cleaned before globe and angle valves are installed. Large particles of solid foreign matter can permanently damage the seating surface in the valve body, causing the valve to leak. Use a minimum amount of a suitable pipe dope on the male connecting threads as excess amounts may fall off and be carried into the valve, causing damage to the seat or other operating parts.

It is totally unnecessary to use excess force in opening or closing RegO valves. The type of seat disc material used and the general design of these valves permits them to be opened and closed easily. Proper valve operation insures unusually long life.

Wrenches must never be used to operate valves equipped with handwheels and designed for hand operation.

Downstream Accessory Boss

These RegO valves incorporate a plugged ¼" F. NPT boss on the downstream side of the body for attaching either a hydrostatic relief valve or vent valve. Boss size on the 2" and 3" valves has been increased to allow a ¾" drilling for accommodation of a standard by-pass valve or jumper lines.

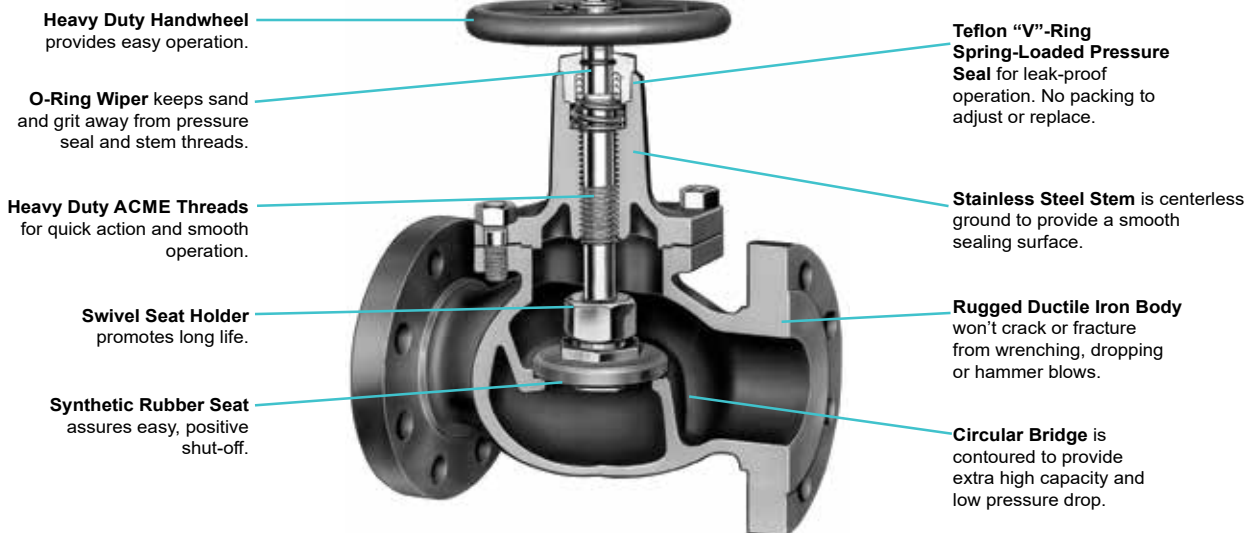
Hydrostatic Relief—When the design of the piping installation is such that liquid may be locked between two shut-off valves, a hydrostatic relief valve should be installed in the lines between the valves. The pressures which can develop due to temperature increase in a liquid fill line are tremendous and can easily damage the valves or piping unless a hydrostatic relief valve is installed.

Vent Valve—If the globe or angle valve is used as a shut-off valve on a loading hose, a vent valve should be installed in the downstream boss to allow liquid trapped beyond the shut-off valve to be vented before disconnecting the hose coupling.

Replace Gate Valves with Flanged Valves

Except for standard flange sizes, RegO Flanged Globe and Angle Valves are smaller and lighter than contemporary valves, thus reducing price and shipping costs and making them far easier to install. RegO face-to-face flange dimensions conform to gate valve dimensions, making replacement of most gate or plug valves with RegO valves simple and easy.

General Features



"V"-Ring Seal Globe and Angle Valves for Bulk Storage Containers, Transports, Bobtails and Plant Piping A7500 Series and TA7500 Series

Specifically designed to ensure positive shut-off and long, maintenance free service life in liquid or vapor service on bulk storage containers, transports, bobtails, cylinder filling plants and plant piping.



The high quality construction and wide variety of sizes make them highly suited for use with LP-Gas, anhydrous ammonia and in the chemical and petrochemical industries.



A7517AP



TA7034



A7513AP



A7505AP



A7514AP



A7518FP



A7517FP

Ordering Information

Part Number				Inlet and Outlet Connection	Port Diameter	Flow at 1 psig (0.07 barg) Pressure Drop (Cv) (GPM/Propane)***		Accessories	
Buna N Seat Discs		Teflon Seat Discs*				Globe	Angle	Hydrostatic Relief Valve	Vent Valve
Globe	Angle	Globe	Angle						
-	-	TA7034P	TA7034LP	½" F. NPT	¾"	10.0	14.8	SS8001U	TSS3169
A7505AP	A7506AP	TA7505AP	TA7506AP	¾" F. NPT		12.0	17.7		
A7507AP	A7508AP	TA7507AP	-	1" F. NPT		1"	17.8		
A7509BP	A7510BP	TA7509BP	TA7510BP	1¼" F. NPT	1¼"	36.5	54.0		
A7511AP	A7512AP	TA7511AP	TA7512AP	1½" F. NPT	1½"	43.0	55.5		
A7511FP	-	TA7511FP	-	1½" Flange**		46.0	-		
A7513AP	A7514AP	TA7513AP		2" F. NPT	2"	75.0	88.5		
A7513FP	A7514FP	TA7513FP	TA7514FP	2" Flange**		78.0	133.0		
A7517AP	A7518AP	TA7517AP	-	3" F. NPT	3⅝"	197.0	303.0		
A7517FP	A7518FP	TA7517FP	-	3" Flange**					

* Teflon seat discs on valves built to order.

** 300# ANSI R.F. Flange.

*** To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in chart by square root of pressure drop.
Example: 7514FP @ 9 psig = $133 \times \sqrt{9} = 399$ GPM/propane. For NH₃ flow, multiple propane flow by .90.

2" & 3" Globe/Angle valves with Built-in Automatic Back Check HA7513AP/HA7514AP and HA7517AP/HA7518AP

Designed for use in conjunction with our 6588LE and 6589LE low emission filler valves installed on bobtails and transports. The valves are designed to stop flow out of the container when the hand-wheel is closed. They incorporate an automatic integral back check that is designed to allow flow back into the container to prevent liquid from becoming trapped between the 6588/89LE and the closed globe/angle valve.



HA7514AP



HA7513AP

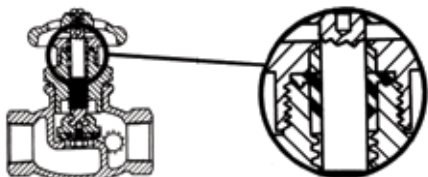
Ordering Information

Part Number		Inlet/Outlet Connection	Port Diameter	Flow at 1 psig (0.07 barg) Pressure drop GPM Propane	
Globe	Angle			Globe	Angle
HA7513AP	HA7514AP	2" -FNPT	2"	75.0	88.5
HA7517AP	HA7518AP	3"-FNPT	3 ½"	197.0	303.0

Flange Seal Globe and Angle Valve Information

General Information

Globe and Angle Valves, incorporating the synthetic rubber flange seal design, operate on the same principle as the "V"-ring valves. Gas pressure in the valve is exerted against the synthetic rubber flange, forcing it tightly against the stem.



Leak-tight performance is assured and periodic adjustment is not required. The synthetic rubber construction provides smooth operating performance with long service life.

These valves all incorporate a plugged 1/4" NPT side boss on the downstream side of the valve that can be equipped with a hydrostatic relief valve or vent valve.

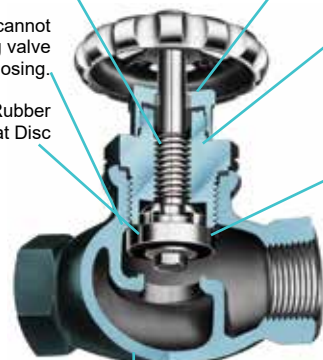
Please be familiar with the "Installation and Operation Note" and "Downstream Accessory Boss" section of the "V"-ring valve design general information before ordering these valves.

General Features

Rugged quick-acting ACME threads on stem. Threads are under flange ring . . . dust, sand and grit can't reach them.

Swivel seat cannot grind during valve opening or closing.

Synthetic Rubber Seat Disc



Nylon bearing surrounds stem to prevent galling.

Rubber flange ring stem seal effectively prevents gas escape. The higher the pressure, the tighter the seal.

Metal to metal back seat permits replacement of flange ring with valve in service.

Valve body made of shell molded ductile iron. Highly resistant to cracking or fracturing from wrenching, dropping or hammer blows. Bonnet and seal cap are steel on "A" prefix valves.

Flange Seal Globe and Angle Valves for Bulk Storage Containers, Filling Hoses and Plant Piping 7704, 7705 and 7706 Series

Designed to ensure positive shut-off and long maintenance-free service life in liquid or vapor service. Ideally suited for use on cylinder charging manifolds, truck filling hoses, bulk storage containers and plant piping.

The high quality construction and wide variety of sizes make them highly suited for use with LP-Gas, anhydrous ammonia and in the chemical and petrochemical industries.



7706P



A7704P

Ordering Information

Part Number		Inlet & Outlet Connection (F. NPT)	Flow at 1 psig Pressure Drop (Cv) (GPM, LPM/Propane)*		Accessories	
Globe	Angle		Globe	Angle	Hydrostatic Relief Valve	Vent Valve
7704P	7704LP	1/2"	7.3	12.3 GPM	SS8001J or SS8001L	TSS3169
A7704P	A7704LP			46.6 LPM		
7705P	7706P	3/4"	11.5	17.7 GPM		
A7705P	A7706P			67 LPM		

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: A7704LP @ 9 psig (0.62 barg)=12.3 x 9 = 36.9 GPM/propane. For NH₃ flow, multiply propane flow by .90.

Flange Seal Liquid Transfer Angle Valves for Bulk Storage Containers 7550 and 7551 Series

Designed especially for liquid transfer of LP-Gas from consumer bulk storage containers when used with a Chek-Lok® or equipped with an integral excess flow valve. May also be used for vapor LP-Gas service.



In NH₃ applicator tanks they may be used as a vapor bleeder valve or as a liquid withdrawal valve when installed in a coupling with a dip pipe.

These liquid transfer valves are equipped with an integral excess flow valve for liquid transfer directly from the tank fitting, or without an integral excess flow for LP-Gas transfer through a Check-Lok®.

When equipped with an integral excess flow valve (7550PX), the valve should be mounted in a forged steel 3000 lb. half coupling. When mounted in a 1¼" x ¾" NPT reducing coupling, the ¾" female thread in this coupling must be full length — equivalent to a forged steel 3000 lb. half coupling.

The excess flow valve will not function properly if these specifications are not met. Refer to the Warning Bulletin in the Excess Flow Valve Section of this catalog.



7550P



7550PX

Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Integral Excess Flow	Flow at 1 psig (0.07 barg) (Cv) Pressure Drop* (GPM/Propane)	Flow at 1 psig (0.07 barg) (Cv) Pressure Drop* (LPM/Propane)	Excess Flow Approximate Closing Flow** (GPM/Propane)	Excess Flow Approximate Closing Flow** (LPM/Propane)	Accessories	
								Hydrostatic Relief Valve	Vent Valve
7550P	¾"	¾"	No	13.3	50.3	-	-	3127U	3165
A7550P								SS8001J	TSS3169
7550PX			Yes	-	-	16.0	60.6	3127U	3165
A7550PX								SS8001J	TSS3169
7551P	½"	½"	No	8.9	33.7	-	-	3127U	3165
A7551P								SS8001J	TSS3169

* To obtain approximate flow at other than 1 psig (0.07 barg) pressure drop, multiply flow in table by square root of pressure drop. Example: 7550P @ 9 psig (0.62 barg) = 13.3 x 9 = 39.9 GPM/propane. For NH₃ flow, multiple propane flow by .90.

** For NH₃ flow, multiply propane flow by .90.

High Capacity Liquid Withdrawal Valves For NH3 A8012 Series

The A8012 Series is designed especially for use as a high capacity liquid withdrawal valve on anhydrous ammonia nurse tanks or risers.

This valve incorporates an integral excess flow valve; when the valve is in operation the handwheel must be completely open and back-seated to allow the excess flow valve to function properly as explained in the excess flow section of our L-500 and L-102 catalogs.



A8012D

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Approximate Closing Flow GPM	Approximate Closing Flow LPM	Accessories for NH3 Use	
					Hydrostatic Relief Valve	Vent Valve
A8012D	1½" M.NPT	1¼" F.NPT	72 GPM NH3*	272.5 LPM NH3*	SS8001J	TSS3169
A8012C			45 GPM NH3*	170.3 LPM NH3*		

* When installed in a horizontally flowing system.

Multipurpose Valve for Filling of NH3 Containers A8016DBC

Designed specifically for use as a manual filler valve on anhydrous ammonia applicator tanks. This valve incorporates an integral back check valve.



A8016DBC

Ordering Information

Part Number	Inlet Connection	Filling Connection	Filling Capacity at 20 psig (1.38 barg) Pressure Drop GPM/NH3	Filling Capacity at 20 psig (1.38 barg) Pressure Drop LPM/NH3	Accessories	
					Hydrostatic Relief Valve	Vent Valve
A8016DBC	1¼"	1¼"	95	359.6	SS8001J	TSS3169

Multipurpose Valve for Filling of NH3 Containers A8016DP

Designed specifically for use as a manual valve or vapor equalizing valve on anhydrous ammonia applicator and nurse tanks.

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow section of this catalog.



A8016DP

Ordering Information

Part Number	Inlet Connection (M. NPT)	Filling Connection (M. ACME)	Filling Capacity At 20 psig (1.38 barg) Pressure Drop GPM/NH3*	Filling Capacity At 20 psig (1.38 barg) Pressure Drop LPM/NH3*	Approximate Excess Flow Closing Flows			Accessories	
					Liquid* GPM/NH3	Liquid* LPM/NH3	Vapor** CFH/NH3	Hydrostatic Relief Valve	Vent Valve
A8016DP	1¼"	1¼"	95	359.6	44	166.6	24,000	SS8001J	TSS3169

* Determined at 9.5 to 12 psig (0.66 to 0.83 barg) differential.

** Determined at 100 psig (6.89 barg) inlet.

Multipurpose Valves for Liquid Withdrawal of LP-Gas and NH₃ Containers A8017D & A8020D

Designed especially for use as a high capacity liquid withdrawal valve on LP-Gas and anhydrous ammonia containers.

These valves incorporate an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow valve section of this catalog.

The A8017DH is equipped with a soft seated automatic differential back pressure check valve in the seat disc assembly. This allows any pressure build up in the liquid transfer line in excess of 10-15 psig above the container pressure to flow back into the container. The transfer hose is protected against excessive liquid or vapor pressure entrapment, which adds materially to the useful life of flexible hose. In addition to increasing hose service life, the equalizing valve adds substantially to the operating safety of liquid transfer systems.



A8017DP



A8020D

Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Approximate Excess Flow Liquid Closing Flow** (GPM/Propane)	Approximate Excess Flow Liquid Closing Flow** (LPM/Propane)	Accessories	
					Hydrostatic Relief Valve	Vent Valve
A8017DH*	1¼"	1"	49	185.5	Not Required	TSS3169
A8017DP			55	208.2	SS8001J	
A8017DLP		¾"	49	185.5		
A8020D	1¼"	1"	78	295.3	SS8001J	TSS3169

* Built-in back pressure check valve incorporated into shut-off valve.

** Determined at 11.5 to 13.5 psig (0.79 to 0.93 barg) differential for 3/4" outlet and 9 to 12 psig (0.62 to 0.83 barg) differential for 1" outlet. For NH₃ flow, multiply by .90.

Multipurpose Valve for Filling and Liquid Transfer of NH₃ Containers A8018DP

Designed primarily for use as a combination filler and liquid withdrawal valve on three-opening applicator tanks or on nurse tanks.

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow valve section of this catalog.



A8018DP

Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Filling Connection (M. ACME)	Filling Capacity At 20 psig (1.38 barg) Pressure Drop GPM/NH ₃	Filling Capacity At 20 psig (1.38 barg) Pressure Drop LPM/NH ₃	Approximate Excess Flow Liquid Closing Flow GPM/NH ₃	Approximate Excess Flow Liquid Closing Flow LPM/NH ₃	Accessories	
								Hydrostatic Relief Valve	Vent Valve
A8018DP	1 1/4"	1"	1 1/4"	74	280.1	50	189.3	SS8001J	TSS3169

* Determined at 9 to 12 psig (0.62 to 0.83 barg) differential. Nu vivien

Multipurpose Filler Valves 8118P and 8117

Designed primarily for use as a Multipurpose valve with combination filler valve and manual shutoff valve for the outlet connection of the valve for use on LP-Gas containers.

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and back seated to allow the excess flow valve to function properly as explained in the excess flow valve section of the RegO L-102 or L-500 catalogs.



8118P

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Filler Connection	Plug	Filling Capacity at 20 psig (1.38 barg) Pressure Drop (GPM)	Filling Capacity at 20 psig (1.38 barg) Pressure Drop (LPM)	Excess Valve Closing Flow SCFH at 100 psig (6.89 barg)
8117	1 1/4" M. NPT	3/4" F. NPT	1 1/4" M. ACME	No	82 GPM	310.40 LPM	19,300
8118P		1" F. NPT		Yes			

Adhesive Warning Labels

The following warning information, Part Number 903-500, is included with each shipment of Quick-Acting and Tank Car Valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

DANGER

READ THIS FIRST

WARNING

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS, EVACUATE AREA IMMEDIATELY! CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NFPA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.

Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.

Install valves by applying force to wrenching flats only.

Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.

Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.

Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.

Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).

Test excess flow check valve for proper operation before placing into service. See NFPA Bulletin 113 for recommended procedure.

Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.

RegO Filler Valves: To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use ONLY RegO 3119A, 3120 and 3121 Unloading Adapters with RegO Filler Valves. Carefully follow the instructions supplied with these unloading adapters.

If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.

In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NFPA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves" and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.

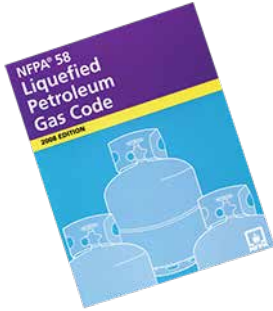


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Part number 903-500

Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

903-500

Safety Warnings



Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.

Nature of Warnings

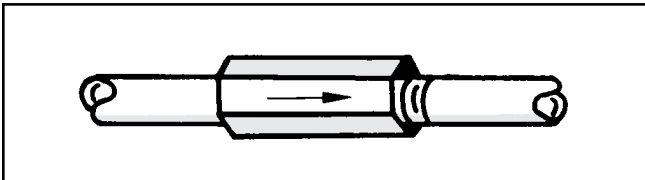
It is recognized that warnings should be as brief as possible, but the factors involved in excess flow valve failures to perform are not simple. They need to be fully understood. If there is a simple warning, it would be:

Make sure that the excess flow valve really closes when the flow exceeds normal transfer flow.

This bulletin is not intended to be an exhaustive treatment of excess flow valves, and certainly does not cover all safety practices that should be followed in installation, operation and maintenance of LP-Gas systems which include excess flow valves.

Selection and Installation

The selection of a given closing rating of an excess flow valve involves an analysis of the complete piping system and is beyond the scope of this bulletin.



It is sufficient to say that an excess flow valve must be installed in the correct direction and will close only if the flow of liquid or vapor exceeds its designed closing rating. Many valves have been installed with closing ratings considerably higher than any flow that could be obtained by a downstream rupture in piping or hoses and thus give none of the protection for which they are intended.

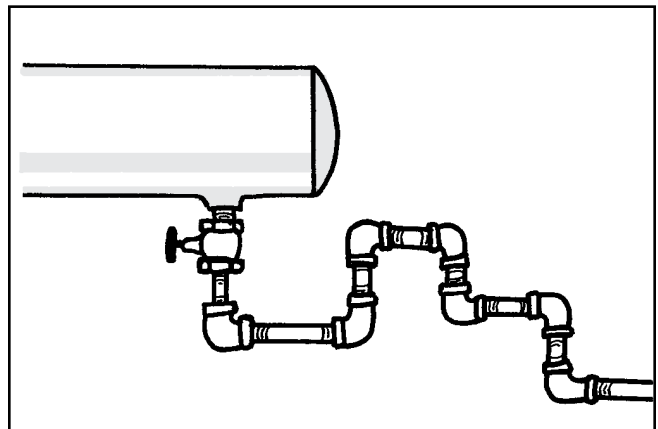
RegO provides excess flow valves with a number of closing ratings. RegO obviously can take no responsibility for the proper selection or correct installation of any valve.

Excess flow valves do not provide complete shut-off because there is a bleed at the check to permit pressure equalization.

Causes of Failure to Close

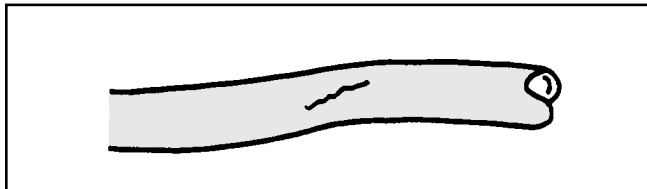
Installers, LP-Gas plant managers and service personnel should be aware that the excess flow valves may not close if these conditions are present.

1. The piping system restrictions (due to pipe length, branches, reduction in pipe size or number of other valves) decrease the flow rate to less than the valve's closing flow.

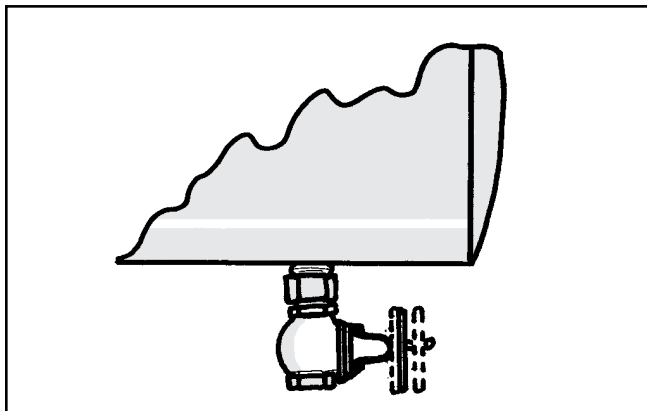


LP-Gas Excess Flow Valves

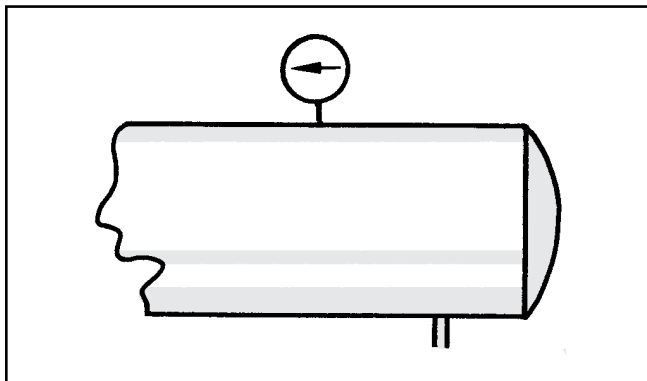
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.



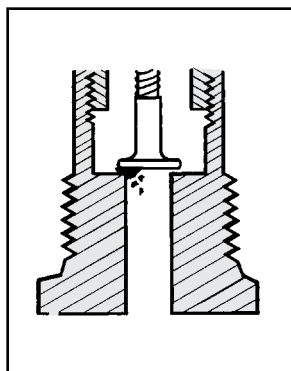
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.



4. LP-Gas pressure upstream of the excess flow valve, particularly due to low temperature, is not high enough to produce a closing flow rate.



5. Foreign matter (such as welding slag, scale or sludge) is lodged in the valve and prevents closing.



Because of these limitations, it is good industry practice to NOT rely entirely on excess flow valves for protection. Installation of emergency shut-off valves with remote controls is recommended in addition to excess flow valves.

Testing

The National Propane Gas Association Safety Bulletin #113-78 states:

"In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating. This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

A test involving venting gas to the atmosphere is hazardous and may be impractical, or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition, and the flow rate sizing for those test conditions."

General Warning

All RegO products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber.

The environment and conditions of use will determine the safe service life of these products. Periodic testing at least once a year when tank pressures are low and maintenance, as required, are essential.

Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because an excess flow valve is used beyond its safe service life. Life of an excess flow valve is determined by the environment in which it "lives". The LP-Gas dealer knows better than anyone what this environment is.

NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could effect them.

Troubleshooting Excess Flow Valve Installations

Periodical Inspections for Excess Flow Valves

Excess flow valves should be tested and proven at the time of installation and at periodic intervals not to exceed one year. CAUTION: Testing an excess flow valve in the summer when tank pressures are high will not prove that the same valve will also function under low pressure conditions in the winter. Once a year testing should be conducted during the winter.

The test should include a simulated break in the line by the quick opening of a shut-off valve at the farthest point in the piping that the excess flow valve is intended to protect. If the excess flow valve closes under these conditions, it is reasonable to assume that it will close in the event of accidental breakage (clean break) of the piping at any point closer to the excess flow valve.

The National Propane Gas Association Safety Bulletin Number 113-78 states:

In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating. This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

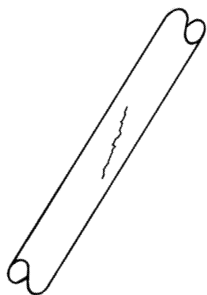
A test involving venting gas to the atmosphere is hazardous and may be impractical or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition and the flow rate sizing for those test conditions.

What prevents excess flow valves from closing when the line breaks?

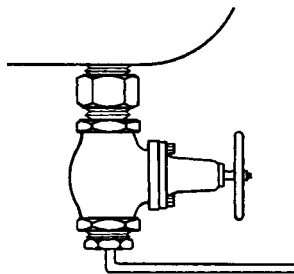
For one or a combination of the following reasons, excess flow valves have been prevented from closing in emergencies:

1. Not a Clean Break



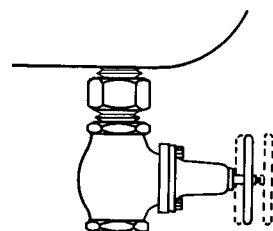
Hoses with a split or tear, and pipe lines not completely severed may be emitting LP-Gas in an amount insufficient to cause an "excess" flow. The amount of LP-Gas which can escape through such breaks may be even less than the flow during normal transfer service and under these conditions the excess flow valve could not be expected to close.

2. Line Restriction Too Great



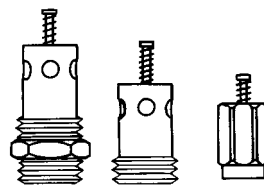
An excess flow valve installed in a tank outlet will not close if the line beyond it is reduced or if the flow is otherwise restricted by too many fittings or too long a run because the line is incapable of passing the amount of LP-Gas necessary to create an "excess" flow. This condition should be corrected when testing a system by simulating a break at the farthest possible point and replacing any restrictive hose, pipe or fittings.

3. Improper Operating Practice



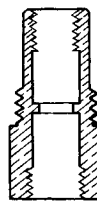
A restriction can also be imposed upon the excess flow valve by an improperly opened valve at the tank outlet. The shutoff valve should be either fully opened or fully closed. If "throttled," the valve could reduce the amount of LP-Gas passing through the excess flow valve in a sufficient amount to keep it from closing. Throttling operations should not be performed in the lines being protected by excess flow valves.

4. Improper Selection



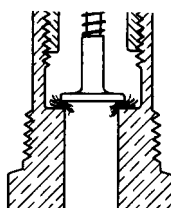
The many types of excess flow valves available are designed for specific jobs. The excess flow valve selected should remain open during normal flow but close at "excess" flow. An inspection which simulates a line break prior to start-up operations will determine if the proper valve has been selected.

5. Tampering with Excess Flow Valves



Sometimes an operator, annoyed with frequent closures of an excess flow valve with too low a rating, has mutilated the valve and forgotten to replace it with a properly rated excess flow valve. A pre-test of the system would reveal this and allow the excess flow valve to be replaced.

6. Impurities in the Line



Dirt, weld slag, broken drill taps, and various other foreign objects have been found jammed between the valve disc and valve seat to prevent excess flow valves from closing. A pre-test of the system would also discover this.

The Limitations of Excess Check Valves for LP-Gas

Excess flow check valves have been of help in limiting gas loss in many incidents involving breakage of hoses and transfer piping. Thus, they do provide a useful safety function in LP-Gas systems. However, there have also been transfer system accidents where excess flow valves have been ineffective in controlling gas loss due to a variety of conditions and to the inherent limitations of these valves. This bulletin explains what protection excess flow valves can offer, points out conditions which can interfere with that protection, and offers suggestions for effective excess flow valve installation.

An excess flow valve is a protective device to help control the discharge of product in the event of complete breakage of pipe lines or hose rupture. However, an excess flow valve can only offer limited protection from gas discharge, because it will only close under those conditions which cause the flow through the valve to exceed its rated closing flow, and even when closed it necessarily allows some "bleed" past the valve.

An excess flow valve is not designed to close and thus may not provide protection, if any of the following conditions are present:

1. The piping system restrictions (due to pipe length, branches, reduction in pipe size, or number of other valves) decrease the flow rate to less than the valve's closing flow. (Valve should be selected by closing flow rating — not just by pipe size).
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.
4. LP-Gas pressure upstream of the excess flow valve, particularly due to low temperature, is not high enough to produce a closing flow rate.
5. Foreign matter (such as welding slag) is lodged in the valve and prevents its closing.
6. A buildup of process material (sludge), which may be found in LP-Gas, may occur over a period of time and cause the valve to stick open.
7. The piping break or damage occurs upstream of an in-line excess flow valve, so the escaping product is not passing through the valve.
8. The flow through the valve is in the wrong direction. (Excess flow valves only respond to flow in one direction.)
9. The excess flow valve has been damaged, or is otherwise not in operating condition.

Because of these limitations of excess flow valves, they should not be relied upon as the only means of controlling the escape of product in the event of piping damage. When possible, shut-off protection by quick closing valves, with shut-off controls accessible in spite of likely line damage, should be provided in addition to, or instead of excess flow valves.

Where excess flow valves are installed, they should be checked to see that:

1. They are installed in the correct direction — the arrow on the valve indicates the shut-off direction.
2. The flow rating on the valve is proper for the installation. The rating must be above the normal system flow, but not higher than necessary to prevent "nuisance" closing in normal conditions. If the manufacturer's catalog information is not sufficient, the valve suppliers can provide sizing assistance.
3. In-line excess flow valves are installed so likely piping damage will occur downstream of the valve and will not separate the valve from the upstream piping.

When the excess flow valves can be examined separate from the line (before the installation or if removed for system maintenance), they should be checked to see that the parts are in good condition and that the poppet can be pushed fully closed.

Testing of Excess Flow Valves

In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating.

This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge, and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick-closing valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

A test involving venting gas to the atmosphere is hazardous and may be impractical, or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition, and the flow rate sizing for those test conditions.

For additional information on excess flow valves and other means of shut-off protection, contact RegO and refer to NFPA 58.

Prepared by
NATIONAL PROPANE GAS ASSOCIATION

The purpose of this bulletin is to set forth general safety practices for the installation, operation, and maintenance of LP-Gas equipment. It is not intended to be an exhaustive treatment of the subject, and should not be interpreted as precluding other procedures which would enhance safe LP-Gas operations. The National Propane Gas Association assumes no liability for reliance on the contents of this bulletin.

Excess Flow Valves

General Information

RegO Excess Flow Valves have been designed, developed, and manufactured for a wide variety of industry needs for more than three decades.

Throughout the years, those concerned with installing and operating bulk plant facilities have looked to RegO products with confidence for reliable, long-lasting valves as required by the National Fire Protection Association (NFPA) Standards 58 and 59, as well as any state, provincial, and local regulations.

It is a responsibility we have not taken lightly. RegO products continue to not only assess the most effective designs, but anticipate and meet the industry's changing requirements. Toward that goal, RegO products include over fifty different types and sizes of excess flow valves (most of which are listed by Underwriters Laboratories) to meet the needs of the LP-Gas and anhydrous ammonia industries.

An Explanation and Warning

An excess flow valve is a spring-loaded check valve which will close only when the flow of fluid through the valve generates sufficient force to overcome the power of the spring holding it open. Each valve has a closing rating in gallons per minute and CFH/air.

The selection of a proper closing rating is critical. It requires a technical understanding of the flow characteristics of the piping system, including restrictions of the piping and other valves and fittings downstream of the excess flow valve.

System designers and operating people must understand why an excess flow valve, which remains open in normal operations, may fail to close when an accident occurs.

Warning: A downstream break in piping or hoses may not result in sufficient flow to close the valve.

How They Work

Excess flow valves permit the flow of liquid or vapor in either direction. This flow is controlled in only one direction (the direction of the arrow stamped on the valve). If the flow in that direction exceeds a predetermined rate (shown in this catalog for each valve), the valve automatically closes.

The valve disc is held in the open position by a spring. When the flow creates a pressure drop across the valve disc that overcomes the preset load on the spring, the valve disc moves to the closed position. It remains closed until the force on both sides of the valve disc are approximately equal (a small bleed hole in the disc of each valve permits equalization), then the spring automatically reopens the valve. When a line is completely broken, the pressure cannot equalize and the excess flow valve remains closed until the line is repaired. Because the bleed hole in each valve disc permits equalization of pressure, excess flow valves do not provide a 100 percent type shut-off.

Proper Installation

Since excess flow valves depend on flow in order to close, the line downstream of the excess flow valve should be large enough not to excessively restrict the flow. If the piping is too small, unusually long or restricted by too many elbows, tees and other fittings, consideration should be given to the use of larger size pipe fittings.

An excess flow valve in a pump suction line cannot be expected to close in the case of a clean break in the line beyond the pump, as the pump constitutes too great a restriction, even if running.

Good piping practices dictate the selection of an excess flow valve with a rated closing flow of approximately 50 percent greater than the anticipated normal flow. This is important because valves which have a rated closing flow very close to the normal flow may chatter or slug closed when surges in the line occur during normal operation, or due to the rapid opening of a control valve.

All installations must be in accordance with NFPA Standards 58 and 59, as well as state, provincial and local regulations.

Cotter pin prevents loss of spring retainer due to vibration in service.

Spring retainer.

Stainless steel spring for consistent closing flow, long service life.

Welded for strength.

Precision machining.

Generous flow channels for lowest pressure drop are particularly important in pump suction lines.



Excess Flow Valves for Liquid or Vapor Service 1519C Series

Designed for top mounting in storage tank manhole covers for liquid or vapor applications. The tapped inlet allows for an optional 1" NPT dip pipe connection to withdraw liquid from the top of the tank.

The 1519C4 is designed for installation in long line or branch piping applications.



1519C2



1519C4

Ordering Information

Part Number	A Inlet Connection NPT	B Outlet Connection F.NPT	C Wrench Hex Flats	D Effective Length (Approx.)	E Threaded End to Port	Approximate Closing Flows**			
						Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
								25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
1519C2	1½" Male*	1"	2¼"	2½"	2½"	25	94.6	5,000	8,800
1519C4	2" Female	2"	3"	4½"	-	170	643.5	28,590	48,600

* 1" Female Dip Pipe Connection

** Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow.

Excess Flow Valves for Liquid or Vapor Line Service 1519A Series, 1519B Series and A1519 Series

Designed for top installation, in any position, in liquid or vapor service lines. They are intended for long lines or branch piping where tank mounted excess flow valves cannot suffice.



**1519A2, 1519A3, 1519A4, 1519B4,
A1519A2, A1519A4, A1519B4**



A1519A6

Ordering Information

Part Number	Brass or Steel	Inlet Connection NPT	Outlet Connection F. NPT	Wrench Hex Flats	Effective Length (Approx)	Approximate Closing Flows*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
1519A2	Brass	1"	1"	1¾"	3⅞"	25	5,000	8,800
A1519A2	Steel							
1519A3	Brass	1½"	1½"	2¼"	4"	60	11,500	20,200
1519A4		2"	2"	3"	4 ¹³ / ₁₆ "	100	19,000	34,500
A1519A4	4⅞"							
1519B4	Brass				4 ¹³ / ₁₆ "	133	27,700	50,300
A1519B4	Steel							
A1519A6		3"	3"	4"	6 ²⁷ / ₃₂ "	225	45,000	82,000

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

Excess Flow Valves for Liquid or Vapor 3272 Series, 3282 Series, 3292 Series, A3272 Series, A3282 Series, A3292 Series, 7574 and 12472

Designed for liquid or vapor use for filling, withdrawal and vapor equalizing in container or line applications. They are intended for long lines or branch piping where tank-mounted excess flow valves are inadequate.



3282A

Ordering Information

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

Part Number	Brass or Steel	A Inlet Connection (M. NPT)	B Outlet Connection (F. NPT)	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*			
						Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
								25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
12472	Brass	¾"	¾"	1⅝"	1⅞"	4	15.1	1,050	1,700
3272E					1⅝"	10	37.9	2,100	3,700
3272F						15	56.8	2,800	5,000
3272G						20	75.7	3,700	6,900
A3272G	Steel				1⅝"				
3282A	Brass	1¼"	1¼"	2"	1⅞"	30	113.6	5,850	10,000
3282B						40	151.4	7,600	13,600
3282C					1⅝"	50	189.3	9,000	16,300
A3282C									
7574	Brass	1½"	1½"	2¼"	1⅞"	90	340.7	15,200	28,100
7574L						70	264.98	14,000	25,000
3292A					2"	2"	2⅞"	2"	75
A3292A	3"	100	378.5	18,100			32,700		
3292B	2⅞"								
A3292B	3"				122	461.8			22,100
A3292C	Steel								

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valve for Autogas Dispensing Systems 3272H

Especially designed for high flow/high differential dispensing systems. Can also be used for filling, liquid withdrawal, and vapor equalizing in container or line applications.



3272H

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Wrench Hex Flats	Effective Length (Approx.)	Liquid (GPM Propane)	Liquid (LPM Propane)
3272H	3/4"	3/4"	1 3/8"	1 3/8"	29	109.8

Excess Flow Valves for Container Service

A7537 Series, A7539 Series, A8523 and A8525

Designed for mounting in threaded full or half couplings in container installations. They may be used for filling, withdrawal or vapor equalizing applications. The exceptionally low pressure drop makes them ideal for pump suction lines. If a riser pipe to the vapor space is used with these valves, the minimum inside diameter of the riser pipe must be at least two times the valve thread size in order not to restrict flow to the side inlet ports.



A7537N4

Ordering Information

Part Number	For Use With This Type Coupling	A Inlet Connection M. NPT	B Outlet Connection NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*			
						Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
								25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
A8523	Half	¾"	¾" Male	1½"	1¾"	15	56.8	5,170	8,800
A8525	Half	1¼"	1¼" Male	1¾"	2½"	35	132.5	12,540	21,560
A7537L4	Half	2"	2" Male and 1¼" Female	2⅝"	2½"	75	283.9	13,000	25,600
A7537L4F	Full					125	473.2	25,000	42,500
A7537N4	Half								
A7537N4F	Full								
A7537P4	Half					150	567.8	30,500	52,000
A7537P4F	Full								
A7539R6	Half	3"	3" Male and 2" Female	3¾"	3⅝"	150	567.8	32,100	55,500
A7539R6F	Full					200	757.1	39,400	68,300
A7539T6	Half								
A7539T6F	Full								
A7539V6	Half					250	946.4	51,100	88,700
A7539V6F	Full								

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

F

Excess Flow Valves for Vapor or Liquid

A2137 Series and 2139 Series

Designed especially for filling, withdrawing or vapor equalizing in half and full coupling installations. Ideal for container service where welded-in dip pipes are not provided. For vapor use, mount in the bottom opening with a threaded dip pipe. For liquid use, mount in the top opening with a threaded dip pipe. These may also be installed in pipe lines provided the connection is made to the male inlet thread and not the female dip pipe connection.



A2137

Ordering Information

Part Number	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flows***			
					Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
							25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
A2137	2"	2" Male and 1¼" Female	2⅞"	1⅞"	50	189.3	10,000	17,000
A2137A					70	264.98	14,000	25,000
2139	3"	3" Male and 2" Female	3½"	1¾"	125	473.2	26,500	46,000
2139A					160	605.7	32,700	57,200

* 1¼" F. NPT Dip Pipe Connection

** 2" F. NPT Dip Pipe Connection

*** Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valves for Flange Mounting in Container Service A3500 Series and A4500 Series

Designed for mounting in flanged tank connections with internal threads in the bottom of a container. They may be used in filling, withdrawal or vapor equalizing application. They provide high flow capacity with low pressure drop to minimize pump inlet line cavitation.



If a riser pipe to the vapor space is used with these excess flow valves, the minimum inside diameter of the riser pipe must be at least two times the valve thread size in order not to restrict flow to the side inlet ports.

Flange mounted excess flow valves are readily accessible for servicing and completely enclosed and protected in event of fire. Because there is no direct connection between external piping and the valve, stresses imposed on piping will not affect the excess flow valve.

Ordering Information

Part Number	A Inlet Connection NPT	B For Installation	C Effective Thread (Approx.)	D Threaded End To Port	Approximate Closing Flows*			
					Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
							25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
A3500L4	2"	Slotted Body	¾"	1⅝"	75	283.9	13,000	22,500
A3500N4					125	473.2	25,000	42,500
A3500P4					150	567.8	30,500	52,000
A3500R6	3"		1"	1⅞"	150	567.8	32,100	55,500
A3500T6					200	757.1	39,400	68,300
A3500V6					250	946.4	51,100	88,700
A4500Y8	4"		1⅞"	1⅝"	500	1892.7	89,000	154,000



A3500L4

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valves for Liquid or Vapor Withdrawal 2723C and A8013D Series

These valves are designed for bottom mounting in consumer storage tanks for liquid service. They may also be top mounted for vapor service. These valves are designed especially for use with RegO globe and angle valves.



A8013D



2723C

Ordering Information

Part Number	A. Inlet Connection M. NPT	B. Outlet Connection NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow**			
						Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
								25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
A8013D	1 1/4"	3/4"	1 3/4"	1 3/32"	-	39	147.6	8,700	14,700
A8013DA		1"		1 3/16"		44	166.6		
A8013DB		1 1/4"		1 1/2"		55	208.2		
2723C	1 1/4"	3/4"	1 1/16"	1 5/16"	1 15/16"	20	75.7	3,900	6,900

* 3/4" F. NPT Dip Pipe Connection

** Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

Excess Flow Valve for Pressure Gauges 2884D

Designed for container use in pressure gauge installations to minimize excess gas discharge in the event the pressure gauge is sheared. A suitable shut-off valve should be installed between this valve and the pressure gauge to allow convenient gauge replacement.



2884D

Ordering Information

Part Number	A. Inlet Connection M. NPT	B. Outlet Connection F. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
2884D	3/4"	1/4"	1 1/16"	1 1/16"	1 5/16"	N/A	60	110

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow.

Excess Flow Valve for DOT Cylinders 3199W

Designed for use on portable systems with vapor or liquid including torches, heaters, lead melting burners, tar and asphalt burners, wallpaper steamers and other applications involving portable DOT cylinders. The POL inlet attaches directly to the cylinder valve and the outlet mounts to the regulator.



3199W

Ordering Information

Part Number	A. Inlet Connection	B. Outlet Connection	C. Wrench Hex Flats	D. Effective Length (Approx.)	Approximate Closing Flow*			
					Liquid (GPM Propane)	Liquid (LPM Propane)	Vapor SCFH (Propane)	
							25 psig (1.72 barg) Inlet	100 psig (6.89 barg) Inlet
3199W	Male POL	1/4"	7/8"	2 1/16"	.95	3.596	265	500

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

NOTE: Multiply flow rate by .94 to determine liquid butane flow.

Chek-Lok® Excess Flow Valves 7590U and 7591U Series

Chek-Lok® Excess Flow Valves are designed to provide a convenient means of withdrawing liquid from stationary containers prior to moving the container. The Chek-Lok® permits one transfer shut-off valve with an adapter to be used interchangeably on a number of tanks.

The 7590U and 7591U Chek-Loks® are also designed for use on permanent installations provided the excess flow valve is sized properly for the system and piping. NOTE: In some cases, it may be necessary to use an in-line excess flow valve to protect the downstream piping. This valve is not recommended for use as a liquid source for pumps.



7590U with Cap

Ordering Information

Chek-Lok® Number	Inlet Connection	Outlet Connection	A. Body Wrench Hex Flats	B. Approximate Effective Length	C. Cap Wrench Hex Flats	Approximate Closing Flow, Liquid GPM (Propane)*	Approximate Closing Flow, Liquid LPM (Propane)*
7590U	3/4" M. NPT	1 5/8" UNF	1 3/4"	1 1/16"	1 5/16"	20	75.71
7591U	1 1/4" M. NPT		1 3/4"	1 1/8"		35	132.5

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up, and slightly less when installed with outlet down.

Note: Multiply flow rate by .94 to determine liquid butane flow.

Chek-Lok® Excess Flow Valves

Designed to provide a convenient means of withdrawing liquid from stationary containers prior to moving the container.

NFPA Pamphlet 58 standards require: 1) containers with 125 gallons water capacity, or more, have a connection for liquid evacuation which is at least 3/4" NPT, and 2) containers designed for stationary use, have no more propane than 5% of their water capacity in liquid form during transportation. These rules apply to containers manufactured after July 1, 1961.

Chek-Lok® Operation

Instructions to Open Chek-Lok®

- 1 Loosen cap to vent any accumulated LP-Gas from the Chek-Lok. After venting stops, remove the cap. If venting does not stop, retighten the cap and use other approved means to withdraw liquid from the container.

NOTE: Use a suitable size wrench when removing the cap and adapter from the Chek-Lok. Do not allow the Chek-Lok to un-thread from the tank during removal. When necessary, use a second wrench to secure the Chek-Lok in position.

- 2 Before beginning withdrawal, securely connect a RegO 7550P angle valve or suitable shut-off valve to the adapter. Fully open the shut-off valve – the valve's handwheel must be fully opened before connecting adapter to tank.
- 3 Completely thread the adapter and shut-off valve assembly onto the Chek-Lok by turning adapter's coupling nut clockwise until it is tight. Immediately close the shut-off valve. Listen for an audible click to signal that the Chek-Lok has opened and is actuated for liquid withdrawal. The flow can now be controlled by the transfer valve.
- 4 Check the coupling nut and adapter assembly for leaks using a suitable leak detection solution.

If the Chek-Lok fails to open after following this procedure, the pressure downstream of the shut-off valve should be increased to equalize pressure in the Chek-Lok. It is simple to equalize pressures using vapor from either the vapor return valve or service valve, or from a hose end valve connected to the delivery truck.

Instructions to Close Chek-Lok®

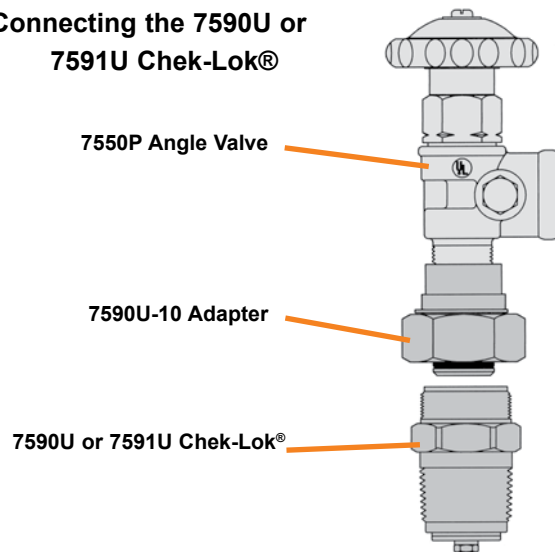
- 1 To re-lock the Chek-Lok, container pressure must be in excess of 35 psig (2.41 barg). Close shut-off valve and disconnect the hose or piping.
- 2 Open shut-off valve fully. Liquid discharging to the atmosphere should cause the excess flow feature of the Chek-Lok to close, provided tank pressure is 35 psig (2.41 barg) or more.

If, for any reason, the excess flow valve does not close, the shut-off valve must be closed immediately and must not be removed until the system can be evacuated and the unit repaired.

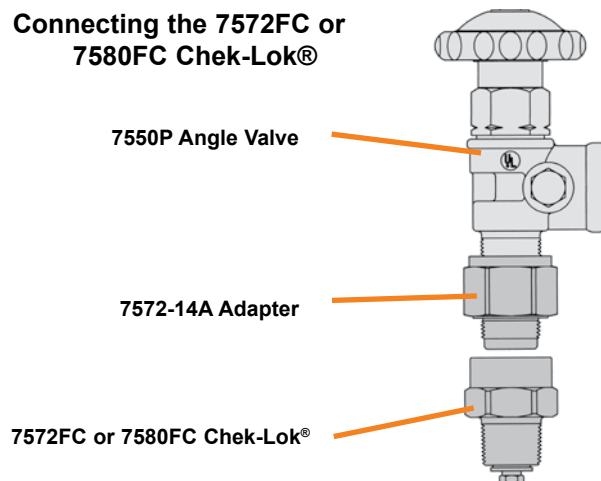
- 3 After the excess flow valve closes, remove the Adapter and Shut-Off Valve Assembly.
- 4 Clean face of Chek-Lok and install the Cap with a gasket. IMPORTANT: Only use the proper Chek-Lok Cap. Do not use a standard pipe cap.

The Chek-Lok® permits one transfer shut-off valve with an adapter to be used interchangeably on a number of tanks. With a Chek-Lok® on each tank and a high capacity RegO 7550P Series transfer valve and adapter on all your service and delivery trucks – the need for individual transfer valves is eliminated. This provides a substantial savings without sacrificing safety.

Connecting the 7590U or 7591U Chek-Lok®



Connecting the 7572FC or 7580FC Chek-Lok®

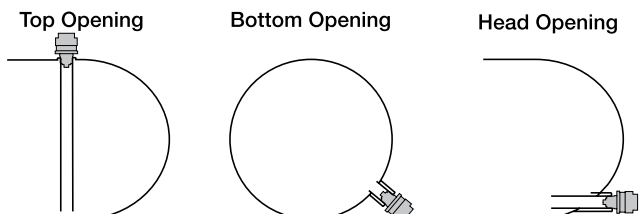


In the absence of a 7550P transfer valve, a 3/4" A7505A Globe Valve or A7506AP Angle Valve may be used. Follow the above procedures using the 7572C-15A adapter instead of the 7572C-14A. Use a RegO 7550P without an adapter in an emergency only.

CAUTION: Always wear approved protective gloves when working with the Chek-Lok®. Do not vent LP-Gas near possible source of ignition.

Chek-Lok® Mounting

Chek-Lok® Valves may be either top mounted with a dip tube or bottom mounted. For bottom mounting, it is preferable to position the coupling in the head or slightly off of the bottom. This helps prevent the accumulation of sludge, etc. around the valve which could affect the proper operation of the excess flow valve.



Chek-Lok® Liquid Evacuation Adapter for 7590U and 7591U Valves 7590U-20

Designed specifically for use with RegO 7590U and 7591U Chek-Lok® Excess Flow Valves. Adapter's operating handle opens and closes equalizing stem in the Chek-Lok® valve. Eliminates gas flow through Chek-Lok® valve when installing or removing adapter. Use of RegO adapter ensures proper connections and opening of the check mechanism.



7590U-20

Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A Wrench Hex Flats	B Approximate Length
7590U-20	1½"-12 UNF	¾"	1¾"	4¾"

7580F-20 Liquid Evacuation Adapter for older design 7572FC and 7580FC Chek-Lok® Valves

Designed specifically for use with RegO 7572FC and 7580FC Chek-Lok® Excess Flow Valves. The adapter's operating handle opens and closes the equalizing stem in these older style Check-Lok® valves. This adapter is designed to eliminate the need for gas to flow from the Chek-Lok® when the adapter is installed or removed. A shutoff valve, such as a full port ball valve must be installed at the outlet of the 7580F-20.



7580F-20

Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	Approximate Length	Wrench Hex Flats
7580F-20	¾" M.NPT	¾" F. NPT	4½"	1½"

F

Union Style Adapters for 7590U and 7591U Valves

The 7590U-10 adapter must be used to connect to the 7590U and 7591U Chek-Lok. This insures a proper connection to open the check mechanism. A built-in nylon gasket provides a gas tight seal.



7590U-10

Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Length
7590U-10	1½" UNF	¾" F. NPT	1¾"	1½"

Adapters for 7572FC and 7580FC Valves

These adapters must be used to connect to the 7572FC and 7580FC Chek Loks to open the check mechanism properly. A built in nylon gasket provides a gas tight seal.



7572C-14A
For Transfer Valves



7572C-15A
For Globe and Angle Valves

Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Effective Length
7572C-14A	¾" M. NPT	¾" F. NPT	1½"	1"
7572C-15A		¾" M. NPT		¾"

Double-Check Filler Valves

General Information

RegO Double-Check Filler Valves incorporate a resilient upper check valve, normally designated as a filler valve, and a lower check valve, commonly called a back pressure check valve. Available in a range of sizes to cover virtually all LP-Gas storage containers, these valves are UL listed and meet NFPA standards, as well as other safety requirements.

Flow of liquid into the storage container opens both check valves. When flow stops, they both are designed to close automatically to permit the operator to disconnect the hose coupling. The automatic closing action also helps prevent the discharge of container contents in the event of hose failure. The lower back pressure check affords extra protection by restricting the discharge if the upper check fails to function properly due to accidents or other causes.

The double back check construction allows emergency inspection, repair, or replacement of the upper fill assembly without removing product from the container. When the upper filler valve body is removed, the lower back check valve provides a seal, permitting only some leakage, allowing a new upper filler valve body to be installed.

Spare Gasket Ordering Information

ACME	Part Number
1¼"	A2797-20R
1¾"	A2697-20R
2¼"	A3184-8R
3¼"	A3194-8R



Double-Check Filler Valves for Large DOT and ASME Tanks

L6579 Series and L7579 Series

Designed to provide fast filling of large motor fuel and ASME domestic tanks. The 6579 Series incorporates a swing-away lower check which greatly reduces pressure drop across the valve. This lower pressure drop promotes faster filling rates and greater efficiency resulting in more profitable operations.



7579P



L7579



L6579

Ordering Information

Part Number		A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM, LPM)				
Basic	With Cap & Lanyard					5 psig (0.34 barg)	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)	75 psig (5.17 barg)
L7579	L7579C	1¼"	1¼"	1½"	1 ²⁷ / ₃₂ "	50 GPM 189.3 LPM	70 GPM 265 LPM	111 GPM 420.2 LPM	157 GPM 594.3 LPM	192 GPM 726.8 LPM
7579P*	-				2 ⁷ / ₃₂ "	37 GPM 140.1 LPM	52 GPM 196.8 LPM	82 GPM 310.4 LPM	116 GPM 439.1 LPM	142 GPM 537.5 LPM
L6579**	L6579C**				1 ²⁷ / ₃₂ "	78 GPM 295.3 LPM	110 GPM 416.4 LPM	174 GPM 658.7 LPM	246 GPM 931.2 LPM	301 GPM 1139 LPM
L6579										

* Incorporates ¾ F. NPT dip pipe connection

** Swing-away lower back check valve design for higher filling rate. NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

New Low Emission Filler Valve with Manual Shutoff Feature 7501L & 7502L

RegO Manual Double-Back Check filler valves that incorporate a resilient upper check and a **manual shutoff feature**. When filling a container from a delivery truck, this valve will allow flow into the container through the upper and lower check, when the manual lever is in the open position. When flow stops both the upper and lower checks will close; the lever is then turned to the closed position, the hose-end valve can then be removed from the filler valve.

Designed for fast filling of larger DOT cylinders and ASME domestic containers; the 7501L and 7502L feature a manual shutoff in addition to upper and lower back checks.



7502L



7501L

Ordering Information

Part Number	Container Connection	ACME Hose Connection	Propane Liquid Capacity at Various Differential Pressures	
			15 psig (1.03 barg)	50 psig (3.45 barg)
7501L	1¼" M.NPT	1¾" M.ACME	62 GPM	125 GPM
7502L			234.7 LPM	473.2 LPM

Combination Filler and Overfill Protection Device (OPD) Low Emissions SF7647V Series

This combined filler valve and overfill protection device is designed to provide fast filling and protection against overfilling of Vertical above ground small bulk type containers. The SF7647V Series offers good fill rates and an overfill prevention device that will stop* the flow of product into the container when the liquid level reaches 80-83% of its capacity.



SF7647V

Ordering Information

Part Number	Propane Liquid Capacity at 20 psig (1.38 barg) differential pressure gallons/minute	Propane Liquid Capacity at 20 psig (1.38 barg) differential pressure liters/minute	Propane Liquid Capacity at 30 psig (2.06 barg) differential pressure gallons/minute	Propane Liquid Capacity at 30 psig (2.06 barg) differential pressure liters/minute	Propane Liquid Capacity at 50 psig (3.45 barg) differential pressure gallons/minute	Propane Liquid Capacity at 50 psig (3.45 barg) differential pressure liters/minute
SF7647V11.0	19	71.92	24	90.85	50	189.3
SF7647V11.1						

Combination Low Emission Filler and Overfill Protection Device (OPD) SFL7579V Series

The SFL7579V Series filler valve is for use on ASME containers. This combined filler valve and overfill protection device is designed to provide fast filling and protection against overfilling of vertical and horizontal above ground LPG containers. This is typically installed in the top of horizontal containers.



Note:

- Must be installed in a vertical position.
- Depending on the application this valve is designed to be used in conjunction with another device such as a fixed liquid level gauge or float gauge in low emission transfer systems.



SFL7579V

Ordering Information

Part Number**	ACME Hose Connection	Tank Connection M.NPTF	Wrench Hex Flats	Length A*	Propane Liquid Capacity at Various Differential Pressures GPM, LPM			
					1 psig (0.07 barg)	25 psig (1.72 barg)	50 PSI (3.45 barg)	75 psig (5.17 barg)
SFL7579V13.8	1 1/4" Male	1 1/4"	1 1/8"	14.43"	23 GPM 87.06 LPM	49 GPM 185.5 LPM	54 GPM 204.4 LPM	66 GPM 249.8 LPM
SFL7579V13.0				13.63"				
SFL7579V12.3				12.93"				
SFL7579V11.1				11.73"				
SFL7579V10.6				11.23"				

* Distance from center thread to float at closure.

** Suffix number indicates dip tube length (Fixed liquid level gauge) different lengths available upon request.

Double Check Low Emission Filler Valves for Forklift and DOT Containers 7647 Series

Designed to provide fast filling of forklift, motor fuel, and recreational vehicle tanks.



Lanyard and Cap



7647SC



7647DC

Ordering Information

Part Number	A Hose Connection	B Tank Connection M. NPT	C Wrench Flats	D Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM, LPM)**				
					10 psig 0.69 barg	20 psig 1.38 barg	30 psig 2.07 barg	40 psig 2.76 barg	50 psig 3.45 barg
7647DC	1 1/4" ACME + F. POL	3/4"	1 1/8"	2 9/16"	14 GPM	20 GPM	24 GPM	27 GPM	50 GPM
7647SC*	1 1/4" ACME		1 1/4"	1 11/16"	53 LPM	75.71 LPM	90.85 LPM	102.2 LPM	189.3 LPM

* Large 1 3/4" hex wrench flats.

** Multiply flow rate by .94 to determine liquid butane capacity.

Double Check Filler Valves for Delivery Truck Tanks and Large Storage Containers 7579S, 6587EC and 3197C

Designed to provide fast filling of bobtails, transports and large bulk storage tanks.

The 6587EC incorporates a swing-away lower check which greatly reduces pressure drop across the valve. This lower pressure drop promotes faster filling rates and greater efficiency resulting in more profitable operations.



Ordering Information

Part Number	A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM, LPM)				
					5 psig 0.35 barg	10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg	75 psig 5.17 barg
7579S	1¾"	1½"	2"	2¼"	44 GPM 166.6 LPM	62 GPM 234.7 LPM	98 GPM 371 LPM	139 GPM 526.2 LPM	170 GPM 643.5 LPM
6587EC*	2¼"	2"	2⅞"	4¾"	92 GPM 348.3 LPM	130 GPM 492.1 LPM	206 GPM 779.8 LPM	291 GPM 1102 LPM	356 GPM 1348 LPM
3197C	3¼"	3"	4"	6½"	148 GPM 560.2 LPM	210 GPM 794.9 LPM	332 GPM 1257 LPM	470 GPM 1779 LPM	575 GPM 2177 LPM

* Swing-away lower back check valve design for higher filling rates.
NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

Single Check Filler Valves for Storage Tanks with Supplementary Back Check Valves 3174C, 3194C and 6584C

Designed for use with RegO Back Check Valves to provide fast filling of bulk storage tanks. Also may be used as a spare or replacement part.

These single check filler valves must never be installed directly into container couplings. They must be used with the appropriate back check valve to comply with NFPA Pamphlet #58.



Ordering Information

Part Number	ACME Hose Connection	Outlet Connection M. NPT	Wrench Hex Flats	Propane Liquid Capacity at Various Differential Pressures (GPM, LPM)				For Use With Back Check Valve:
				5 psig 0.35 barg	10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg	
3174C	1¾"	1¼"	1⅞"	23 GPM 87.06 LPM	33 GPM 124.9 LPM	52 GPM 196.8 LPM	74 GPM 280.1 LPM	3176
6584C*	2¼"	2"	2⅞"	156 GPM 590.5 LPM	220 GPM 832.8 LPM	348 GPM 1317 LPM	492 GPM 1862 LPM	A3186
3194C	3¼"	3"	3½"	147 GPM 556.5 LPM	208 GPM 787.4 LPM	329 GPM 1245 LPM	465 GPM 1760 LPM	A3196

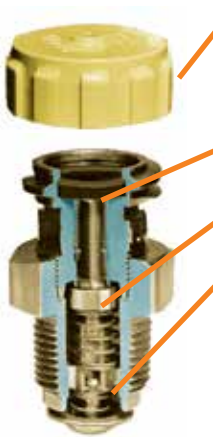
* Stem Assembly designed for higher filling rates.
NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

Vapor Equalizing Valves

General Information

RegO Vapor Equalizing Valves consist of an upper back check valve and lower excess flow valve. In the closed position, the attachment of a vapor hose coupling with its projecting nozzle, opens the back check valve to permit flow in either direction. The lower excess flow valve is designed to close automatically when flow out of the container being filled exceeds the rated capacity. The valve closes automatically when the coupling is removed. Like the double-check filler valves, the vapor equalizing valves utilize a two-piece body construction. The lower excess flow valve will permit some leakage when the upper back check valve is removed for emergency repairs or replacement.

RegO Vapor Equalizing Valves are designed for use in both ASME and DOT containers.



Seal cap made of tough, resilient molded plastic. Protects threads and internal working parts. Caps are designed to contain normal tank pressures, and must be kept on valves at all times.

Long-wearing gasket permits hand-tight connection of cap and hose coupling.

Seat disc of special synthetic composition is extra thick for longer life.

Valve guide is precision machined to ensure positive seal.

Spare Gasket Ordering Information

ACME	Part Number
1 1/4"	A2797-20R
1 3/4"	A2697-20R

Double Check Vapor Equalizing Valves for ASME and DOT Containers
7573 Series and 3183AC

Designed to facilitate loading operations by providing equalization of pressures in the supply and storage containers. The supplementary excess flow valve closes when the flow from the container being filled exceeds a predetermined rate.

The 7573 Series is designed for use in bulk delivery systems and motor fuel containers. The 3183AC is designed for use in delivery trucks and other large containers.



7573 Series

Ordering Information

Part Number		A.	B.	C.	D.	Approx. Closing Flow at 100 psig (6.89 barg) Inlet Pressure (SCFH/Propane)
Basic	W/ Chain & Cap	ACME Hose Connection	Tank Connection M. NPT	Wrench Hex Flats	Effective Length (Approx.)	
7573D	7573DC	1 1/4"	3/4"	1 3/8"	1 15/32"	4,100
-	3183AC	1 3/4"	1 1/4"	2"	2 29/32"	10,000

Single Check Vapor Equalizing Valves for ASME and DOT Containers with Supplementary Excess Flow Valves

Designed for use with RegO Excess Flow Valves to facilitate loading operations by providing equalization of pressures in the supply and storage containers. Also may be used as a spare or replacement part. These vapor equalizing valves must never be installed directly into container couplings. They must be used with the appropriate excess flow valve to comply with NFPA Pamphlet #58.



3170

Ordering Information

Part Number		A. ACME Connection	B. Tank Connection M.NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Approximate Closing Flow at 100 psig (6.89 barg) Inlet Pressure (SCFH/Propane Vapor)	For Use With Excess Flow Valve:
Basic	With Cap & Chain						
3170	-	1 1/4"	3/4"	1 1/4"	1 7/16"	7.600	3272E
-	3180C	1 3/4"	1 1/4"	1 11/16"	1 1/2"	10,000	3282A

General Information

RegO Back Pressure Check Valves are designed to allow flow in one direction only. The check, normally held in the closed position by a spring, precludes the possibility of flow out of the container. When flow starts into the container, the pressure overcomes the force of the spring to open the check. When the flow stops or reverses, the check closes.

Metal-to-metal seats will allow slight leakage after closure. These valves will restrict the escape of container contents in the event of accidental breakage of the piping or fittings.

Back Pressure Valves for Container or Line Applications

3146 Series, 3176 Series, A3186, A3187S, A3196, and A3276BC

Designed to provide protection of a container opening when desired flow is always into the vessel. May be used in line applications where flow must be limited to one direction.

When used with the appropriate single check filler valve, the combination forms a double check filler valve suitable for use in filling of bulk storage tanks.



A3198S



A3187S



3146 Series, 3176 Series, A3186, A3196



A3276BC

Ordering Information

Part Number		A Inlet Connection F. NPT	B Outlet Connection M. NPT	C Wrench Hex Flats	D Effective Length (approx.)	Propane Liquid Capacity at various differential pressures (GPM)			
Brass	Steel					5 psig 0.35 barg	10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg
3146	A3146	3/4"	3/4"	1 3/8"	1 15/16"	11 GPM 41.6 LPM	16 GPM 60.6 LPM	25 GPM 94.6 LPM	36 GPM 136.3 LPM
3146S*									
3176	A3176	1 1/4"	1 1/4"	2"	1 13/32"	28 GPM 105.99 LPM	40 GPM 151.4 LPM	63 GPM 238.5 LPM	89 GPM 336.9 LPM
	A3276BC*				2 1/8"	32 GPM 121.1 LPM	45 GPM 170.3 LPM	73 GPM 276.3 LPM	103 GPM 389.9 LPM
	A3186	2"	2"	3"	2 3/8"	124 GPM 469.4 LPM	175 GPM 662.4 LPM	276 GPM 1044.8 LPM	391 GPM 1480.1 LPM
	A3187S* **	2" M & 1 1/4" F	2" M & 1 1/4" F	2 3/8"	1 27/32"	60 GPM 227.1 LPM	110 GPM 416.4 LPM	225 GPM 851.7 LPM	350 GPM 1324.9 LPM
	A3196	3"	3"	4"	3 7/32"	297 GPM 1124.3 LPM	420 GPM 1589.9 LPM	664 GPM 2513.5 LPM	939 GPM 3554.5 LPM
	A3198S* **	3" M & 2" F	3" M & 2" F	3 1/2"	3 1/4"	210 GPM 794.9 LPM	290 GPM 1097.8 LPM	400 GPM 1514.2 LPM	

*Soft seat version.

**The 1 1/4" and 2" outlet connections are for a standpipe when installed inside of a container.

NOTE: Multiply flow rate by .94 to determine liquid butane capacity and by .90 to determine liquid anhydrous ammonia capacity.

Swing-Away Back Pressure Check Valves for Container or Line Applications 6586D and A6586D

Designed to provide protection of a container opening when desired flow is always into the vessel. May also be used in the line applications where flow must be limited to one direction.



When used with the appropriate single check filler valve, the combination forms a double check filler valve suitable for use in filling of bulk storage tanks.

The swing-away check offers more efficient flow rates than conventional designs. It swivels open vertically to reduce pressure drop across the valve and improves flow rates.



6586D

Ordering Information

Part Number		A. Inlet Connection F. NPT	B. Outlet Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM, LPM)			
Brass	Steel					5 psig 0.35 barg	10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg
6586D		2"	2"	2 ³ / ₄ "	2 ¹ / ₂ "	190 GPM	270 GPM	420 GPM	600 GPM
	A6586D			2 ⁷ / ₈ "		719.2 LPM	1022 LPM	1590 LPM	2271 LPM

NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

Back Pressure Check Valves for Flanged Installation A3400L4 and A3400L6

Designed to provide high flow capacity and allow more efficient tank filling than conventional designs. The unobstructed throat area reduces flow turbulence through the valve, thereby reducing pressure drop. Large flow channels and spacious side ports ensure ample capacity for the most demanding high capacity filling operations.



The valve is designed for installation in internally threaded flanges in container bottoms.



A3400L6

Ordering Information

Part Number	A. Flange Connection M. NPT	B. Wrench Hex Flats	C. Overall Length	D. Threaded End To Port	Propane Liquid Capacity at Various Differential Pressures (GPM, LPM)			
					5 psig 0.35 barg	10 psig 0.69 barg	25 psig 1.72 barg	50 psig 3.45 barg
A3400L4	2"	Slotted	5 ¹ / ₄ "	1 ⁵ / ₁₆ "	223 GPM 844.1 LPM	316 GPM 1196 LPM	500 GPM 1893 LPM	707 GPM 2676 LPM
A3400L6	3"		5 ⁵ / ₃₂ "	1 ⁵ / ₁₆ "	424 GPM 1605 LPM	600 GPM 2271 LPM	949 GPM 3592 LPM	1342 GPM 5080 LPM

NOTE: For installation in flange tank connections with internal threads, see the "Flanged Installation in Container" section under "Excess Flow Valves." Multiply flow rate by .94 to determine liquid butane capacity and by .90 for liquid anhydrous ammonia capacity.

Adhesive Warning Label 7572-400

The following warning information, Part Number 903-500, is included with each shipment of Excess Flow, Check, Filler and Vapor Equalizing Valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from RegO and Authorized Product Distributors.

The 7572-400 adhesive warning label is intended for application as close as possible to the Chek-Lok® once the Chek-Lok® is installed.

The basic information contained on the label is intended for the benefit of the user of the Chek-Lok® and is not intended to be an "all-inclusive" product warning.

This label is printed on a heavy duty material with pressure sensitive adhesive backing. The ultra-violet ink stands up well when exposed to the environment.

Part Number	Description
7572-400	Adhesive Warning Label

DANGER
READ THIS FIRST
WARNING

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL OR HEAR ESCAPING GAS...**EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

Make sure you are thoroughly trained before you attempt any valve installation, maintenance or repair. Improper conditions or procedures can cause accidents resulting in property damage and personal injury.

Become thoroughly familiar with NFPA Safety Pamphlet 300 "LP-Gas Regulator and Valve Inspections & Maintenance" and RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs. Follow their recommendations.

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 4.4 states: "Persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years and shall be documented."

Make sure this valve is the proper one for this installation. Avoid misusing LP-Gas equipment.

Apply thread joint compound compatible with LP-Gas on valve external threads only. Make sure compound never comes into contact with other parts of the valve.

Install valves by applying force to wrenching flats only.

Tighten pipe threads approximately 1 to 1½ turns beyond the hand-tight insertion point using a wrench which avoids damage to other valve parts.

Check for damage and proper operation after valve installation. Check that the valve is clean and free of foreign material.

Check container-valve connection with a non-corrosive leak detection solution before filling with LP-Gas.

Purge container before filling with LP-Gas (refer to the RegO LP-Gas Serviceman's Manual for recommended procedure).

Test excess flow check valve for proper operation before placing into service. See NFPA Bulletin 113 for recommended procedure.

Check outlet connection make-up for leaks with a non-corrosive leak detection solution when placing into service.

RegO Filler Valves: To prevent damage to the internal checks when it is necessary to utilize an unloading adapter, use **ONLY RegO 3113A, 3120 and 3121 Unloading Adapters with RegO Filler Valves**. Carefully follow the instructions supplied with these unloading adapters.

If container is not being placed into service at the present time, insert plug or cap onto the outlet connection.

In selecting a label for posting at the installation site, consider RegO part number 901-400 or 903-400 along with your own, NFPA's and others.

Remember to instruct the owner/user/customer in safety matters concerning LP-Gas and this equipment. See RegO Safety Warnings "LP-Gas Cylinder Valves", "LP-Gas Excess Flow Valves", and "LP-Gas Filler and Hose End Filling Valves" found in the cylinder valve, excess flow valve, and filler valve sections of the L-500 & L-102 Catalogs.

RegO requests that this information be forwarded to your customers. Additional copies are available from RegO and your authorized RegO Distributor.



Printed in USA 09A-0910-0686
Part number 903-500

Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

903-500

DANGER
WARNING

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR ESCAPING GAS...**EVACUATE AREA IMMEDIATELY!** CALL YOUR LOCAL FIRE DEPARTMENT! DO NOT ATTEMPT TO REPAIR. DO NOT STORE IN BUILDING OR ENCLOSED AREA. DO NOT USE ON HOT AIR BALLOONS OR AIRCRAFT.

CAUTION!

Use this CHEK-LOK® connection only for liquid evacuation before moving tank in accordance with NFPA Pamphlet 58, which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Read and follow RegO product instruction number 7572FC-301.

DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL.
DO NOT FILL THIS CONTAINER UNLESS THIS LABEL IS READABLE.

ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM

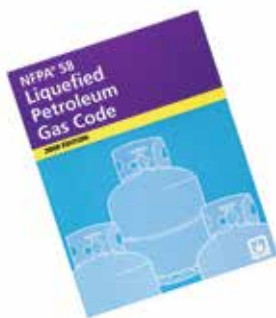


Printed in U.S.A. 05-0114-0386
Part Number 7572-400

Elon, N.C. 27244 U.S.A. Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

7572-400

Warnings



Purpose

In its continuing quest for safety, RegO publishes a series of bulletins explaining the hazards associated with the use, misuse, and aging of LP-Gas valves and regulators. It is hoped that these factual bulletins will make clear to LP-Gas dealer managers and service personnel, that the utmost care and attention must be used in the installation, inspection, and maintenance of these products, or problems could occur which would result in injuries and property damage.

The National Fire Protection Association NFPA 58 Liquefied Petroleum Gas Code - 2017 Edition states in Section 4.4 Qualification of Personnel; "Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures... Refresher training shall be provided at least every 3 years, initial and subsequent training shall be documented". These "RegO Safety Warnings" may be useful in training new employees and reminding older employees of hazards that can occur. It is recommended that all employees complete the Propane Education Research Council's Certified Employee Training Program.'

Nature of Warnings

It is recognized that warnings should be as brief as possible, but the factors involved in internal valve and excess flow valve failures to perform are not simple. They need to be fully understood. If there is a simple warning, it would be:

Make sure that the internal valve's excess flow feature really closes when the flow exceeds rated closing flow, and that the valve will shut-off.

This bulletin is not intended to be an exhaustive treatment of internal valves, and certainly does not cover all safety practices that should be followed in installation, operation and maintenance of LP-Gas systems, which include internal valves.

Internal valves must be closed on Cargo Vehicles when traveling on public roads and highways. The valve should only be open when pumping. Per MC 330 or 331, internal valves must also be equipped with remote closure system when used on transports or bobtails.

There are two types of internal valves being used on storage tanks, transports and bobtails — spring loaded internal valves and differential pressure internal valves. They both provide positive shut-off when product is not being withdrawn and may include excess flow protection for the system during transfer operations.

Spring Loaded Internal Valves

Spring loaded internal valves are manually opened by levers, by means of fuse linked cable mechanisms or pneumatic or hydraulic actuators. They incorporate an excess flow feature that will close the valve when the flow through the valve exceeds its rate of flow. These valves should never be locked open by means of wires, chains, pegs or other devices.

Testing

Testing should be completed on a periodic basis.

1. To check operation of a spring loaded valve, activate the remote control to close the valve while unit is pumping. If the meter indicator flow continues, the valve should be repaired immediately.

2. Testing excess flow feature.

The National Propane Gas Association Safety Bulletin #113-78 states: "In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating."

This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained.

The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that the excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

A test involving venting gas to the atmosphere is hazardous and may be impractical, or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valves condition, and the flow rate sizing for those test conditions.

3. Tight Shut-Off — A test should be made to ensure the internal valve will give a gas tight seal when the valve is in the closed position. This will require removal of all product downstream from the internal valve, to ensure the valve will give 100% seal when in the closed position. If the internal valve does not give 100% seal the valve should be repaired immediately.

Pressure Differential Internal Valves (Flomatics®)

Pressure differential valves (Flomatics®) open by pump pressure and close when the pump stops. These valves must never be locked open by means of wires, chains, pegs or other devices.

Testing

Testing should be completed on a periodic basis.

1. To check operation of a differential pressure internal valve activate the remote control shut-off valve while the unit is pumping. If the meter indicates that flow continues the valve should be repaired immediately.

2. Since the differential pressure internal valve requires at least 18 psi (1.24 barg) to open and 8 psig (0.55 barg) over container pressure to keep open, a test may be performed to check for closure. With the PTO disengaged, connect delivery hose to a container with very low pressure. Then with hose end valve open, engage PTO. The internal valve should remain closed, no flow should be detected through the meter. If flow continues through the meter the valve should be repaired immediately.

3. Tight Shut-Off — A test should be made to ensure the internal valve will give a gas tight seal when the valve is in the closed position. First ensure the pump prime valve is closed by turning clockwise until it seats. Then with the valve closed (PTO disengaged) the product downstream from the internal valve will have to be safely removed. If the internal valve does not give 100% seal, the valve should be repaired immediately.

General Warning

All RegO Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber.

The environment and conditions of use will determine the safe service life of these products. Periodic testing at least once a year when tank pressures are low and maintenance, as required, are essential.

Because RegO products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because an excess flow valve is used beyond its safe service life. Life of an excess flow valve is determined by the environment in which it "lives". The LP-Gas dealer knows better than anyone what this environment is.

NOTE: There is a developing trend in state legislation and in proposed national legislation to make the owners of products responsible for replacing products before they reach the end of their safe useful life. LP-Gas dealers should be aware of legislation which could effect them.



Manual Internal Valves

A3200 Series

General Information

Manual Internal Valves are designed for a variety of uses in LP-Gas and anhydrous ammonia service. In addition, accessories allow most of them to be actuated manually, by cable or with air.

Installation, usage and maintenance of this product must be in compliance with all RegO instructions, as well as requirements and provisions of NFPA # 58, DOT, ANSI, and all applicable federal, state, provincial, and local standards, codes, regulations and laws.

How The Valves Work

Refer to the drawings. View "A" shows the valve held closed without leakage by tank pressure and the valve's closing spring. Actuation of the operating handle alone does not open the valve, it only allows pressure to equalize between the inlet and outlet of the valve by rapid bleeding of the product downstream. This equalized pressure then allows the valve to open via the internal spring.

The valve opens by moving the handle to mid-point, see view "B". This position allows the actuator to put the equalizing portion of the valve stem in the pilot opening, allowing more product to bleed downstream than if the handle was fully open.

In a few seconds, the tank and downstream pressure will be nearly equal. The excess flow spring will push the main poppet to the open position, see view "C", the handle should then be moved to the fully open position.

If at first, the handle is quickly moved to the fully opened position, the pilot valve allows a small amount of bleed downstream, but much less than during rapid bleed (view "B"). This results in a longer pressure equalizing time before the main valve can open.

NOTE: The main poppet will not open until outlet pressure approximates tank pressure!

Once the main poppet is open, flow greater than the excess flow rating, or a sufficient surge in flow, forces the main poppet closed against the excess flow spring, as seen in view "D". The pilot valve in this position is open and allows a small amount of bleed downstream, but much less than during rapid bleed (view "B").

When the operating handle is moved to the closed position, the valve closes and a leak-tight seal is re-established as seen in view "A".

NOTE: To provide excess flow protection, the flow rating of the pump, piping, valves, fittings, and hose on the inlet and outlet sides of the valve must be greater than the flow rating of the valve. Any restrictions that reduce the flow to less than the excess flow valve rating will result in the excess flow valve not operating when required.

Valve Operation and Precautions

1. Valve must be opened before starting pump, and before opening valve on pump outlet.
2. Leave pumping system "wet" to avoid drying of seals and to reduce time involved in opening valve. Drain piping only when required by codes or safe operating practices.
3. When piping is dry or at lower pressure than the tank, open valve half-way for a few seconds to allow line pressure to equalize before fully opening the valve handle. The main poppet may not open immediately if the handle is placed in the open position too quickly.
4. Flow surges may close the built-in excess flow valve and should be avoided. If the valve slams shut, immediately stop the pump, close the nearest downstream valve, and move handle to midpoint position to equalize pressure until valve reopens with a click, then restart pump and open downstream valve slowly.

These valves must remain in the closed position except during product transfer. A line break downstream of the pump may fail to actuate the excess flow valve as the pump may limit flow. If break occurs in the system, or the excess flow closes, immediately shut down the system.

Inspection and maintenance on a periodic basis is essential. Installation and maintenance must be performed only by qualified personnel.

Be sure all instructions are read and understood before installation and operation of these valves.

5. Always keep valve closed except during product transfer.

6. Completely open all valves during pumping. Partially closed or throttle type valves may prevent excess flow valve from closing when required, even in a properly designed piping system.

7. All personnel must be aware of remote closure locations and their operation in case of emergency. They must also be aware of the equalizing opening through which bleeding can occur after the excess flow valve closes. If this bleed is not stopped by closing a downstream valve, a hazard may occur.

8. Never, under any circumstances, permanently wire open the operating handle of the internal valve.

Cable Control System

The cable control system employed must meet the requirements and be in accordance with the provisions of NFPA #58, DOT, ANSI, and all applicable federal, state, provincial and local codes.

Troubleshooting

- 1. Internal Valve Will Not Open.** Causes may be excess leakage downstream, pump engaged too quickly, excessive wear of valve, or ice freezing of poppet.

When there is excessive volume downstream, a greater amount of time is required to equalize tank and downstream pressure.

To determine if the pilot seat is opening, install a pressure gauge downstream of valve outlet, open any hand valves between valve and pressure gauge, and open valve. Pilot seat is not opening if pressure does not build up to tank pressure. Perform this test with pump off. A broken internal part may cause pilot seat not to open.

If operating handle rotates past the full open position, there is internal malfunctioning, and the valve must be disassembled and repaired.

- 2. Premature Valve Closure.**

First, check to see that operating lever is properly connected and fully opens valve. Premature closure may also be a result of engaging pump too quickly, sudden line surges, an underrated excess flow spring or an obstructed inlet port.

- 3. Valve Will Not Close.**

Usually a result of faulty or sticking actuator. First, check the actuator to see that it works freely by disconnecting it from valve handle and cycling it several times. Also, operate valve handle manually. If it sticks in the open position, replace the packing and bushings. This should free the operating mechanism providing the valve has no internal damage.

- 4. Low Flow Capacity**

Downstream piping may be too small and/or long, screen or strainer may be plugged, possible restriction downstream, or a bypass valve stuck in the open position are causes of low flow. Also, the bypass valve may be set too low and prematurely opening. Check for high differential pressure across the bypass valve. If bypass valve is open, the differential across the valve should not exceed 5 to 6 psig (0.35 to 0.41 barg).

Maintenance

Potential problems may be eliminated with preventive internal valve maintenance. Perform the following steps once a month:

1. Check to see that the operating lever moves freely and smoothly. There should be no leakage around the lower stem or seal housing. Leakage requires replacement of the seal housing packing. A sticking lever indicates trapped foreign material or mechanism wear.

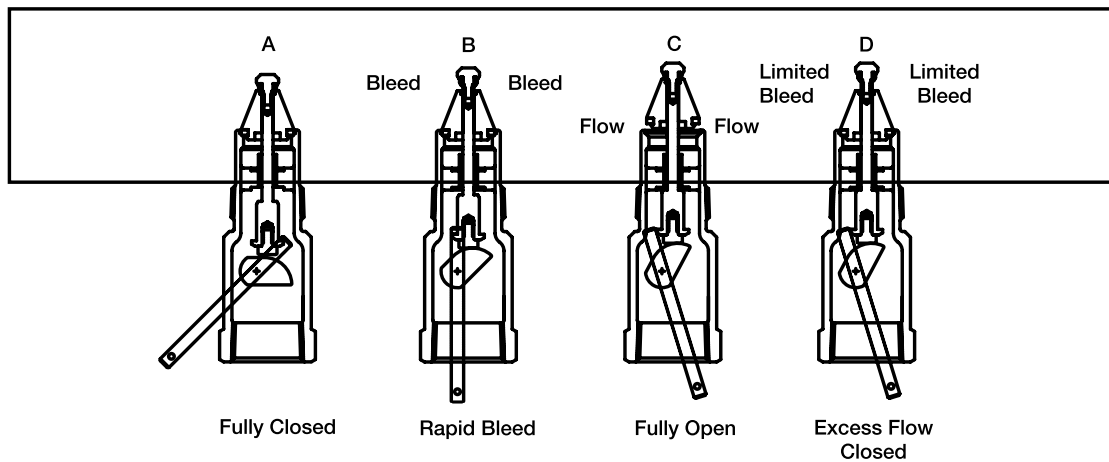
2. Check both seat discs for tight closure. Close valve and exhaust downstream pressure. Be sure piping is warmed to an ambient temperature. Close the first downstream valve and note pressure buildup between the closed valves with a pressure gauge. If leakage occurs, replace both seat discs.

3. Inspect, clean and oil all operating controls. Check controls to see that they open fully, but do not overtravel the valve operating lever. See that they work freely to close the valve. Worn parts should be replaced.

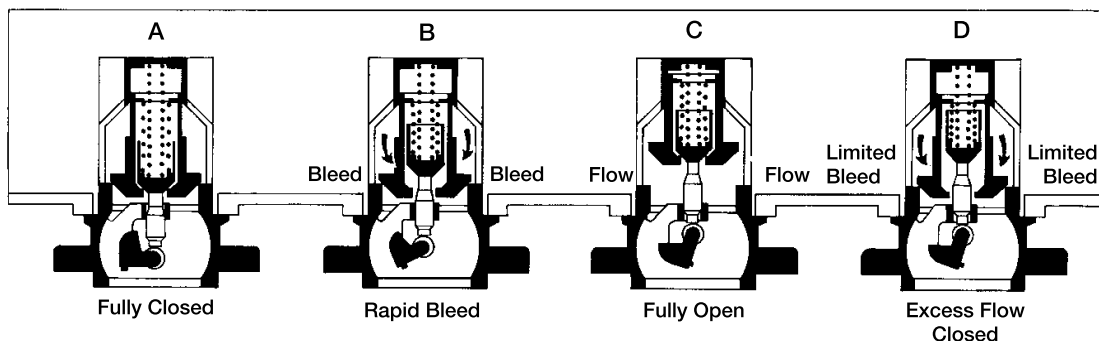
4. Remove valve if the tank is to be steam cleaned. Heat may damage the valve's seals.

5. Valve is not designed for water service. After tank is hydrostatically tested, immediately remove all water and allow tank to thoroughly dry out before installing valve.

A3209D Series, 1¼" Straight
A3209DT Series, 1¼" Straight
A3211D Series 1½" Straight
A3212R Series, 2" Straight
A3212R T Series 2" Tee Body
A3213D Series, 3" Straight
A3213DT Series 3" Tee Body



A3219FA Series, 4" Flanged

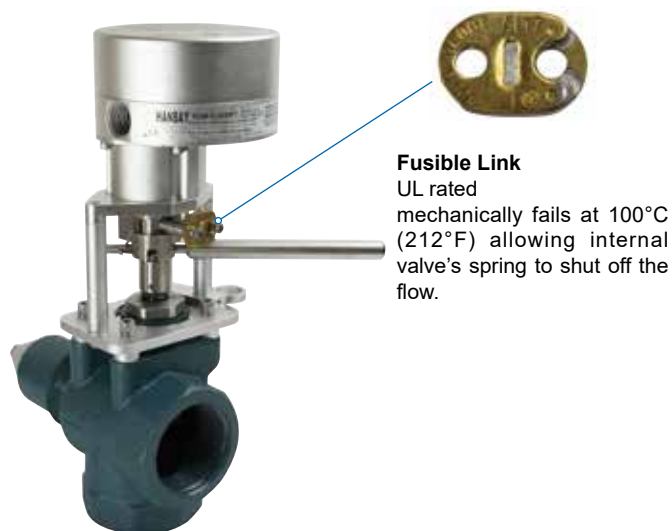


Electric Actuators

Electric Actuators are a simple, safe and reliable solution with accurate and smooth motion control. There is no need for a compressed air source and no concern of moisture freezing shutting a system down. Remote emergency-shut-down locations can be easily installed and easily maintained. The electric actuators come installed on the valve and are tested for proper operation at the factory. All electric actuators are rated CSA UL Class 1 Div 1 Explosion proof enclosures.

Electric actuators are available to retrofit existing RegO valves and are easy to install. Positional indication and operation, can be remotely to a truck cab or control panel (or PLC) to indicate valve position. Manual override handle also indicates position and can be used for Lock-Out. An internal heater is installed to ensure reliability. A thermal fuse is incorporated to ensure no over temp.

Safety Features



Fusible Link
UL rated
mechanically fails at 100°C (212°F) allowing internal valve's spring to shut off the flow.

Electronic Thermal Cut-Off

Internal component cuts power line at 89°C (208°F). Actuator closes when power is lost.

General Specifications

Model	Torque Range (in-lbs)	Speed Range (time to open)
RDM	44 .. 95	2 sec .. 10 sec

- Enclosure: NEMA 6 / IP67 IP67 / 40°C (104°F)
- Enclosure: Class 1, Div 1 Groups D, C, D /T6
- Temperature Range: -40°C/F .. 70°C (185°F) Internal heater standard
- Finish: Anodized white, Stainless
- Stall Protection: By current sense and motion detection
- Feedback: Limit switches
- Life Expectance: 250,000 cycles or equivalent under specified conditions
- Motor: BLDC brushless DC motor
- Voltages: 12/24 VDC
- Positioning precision: +/- 3 deg
- Range Setting: Set according to valve
- Speed setting: Set according to valve
- End of travel detection: By current sense and motion detection
- Power setting: Set according to valve
- Motor control: Internal micro controller
- Mechanical shock: 1 m drop test no damage to function Random SAE J1211, Chassis, Exterior
- Mechanical vibration: Random SAE J1211, Chassis, Exterior
- Housing: All housing parts anodized aluminum
- Bearings: Oiled for life porous bronze bearings
- External Fasteners: Stainless Steel
- Manual Override: Mounted Directly on the valve stem
- Control: 12/24 VDC TTL
- Limit Switches: Switches are triggered at fully closed, and fully open position. (independent I/O)

1¼" Threaded Internal Valve with Electric Actuator for Small Capacity Pumping Systems and Bobtail Vapor Equalization A3209E Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on small capacity pumping systems, NH₃ nurse tanks and in-line installations. It may also be installed in the vapor equalizing opening on bobtail delivery trucks. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications. The valve may be actuated manually by hand or cable.



A3209E

Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Voltages	Closing Flow (GPM, LPM)				LP-Gas Vapor Capacity** (SCFH/Propane)	
				LP-Gas (GPM)	LP-Gas (LPM)	NH ₃ (GPM)	NH ₃ (LPM)	25 psig (1.72 barg)	100 psig (6.89 barg)
EA3209D050	1¼"	1¼"	12/24 VDC	50	189.3	45	170.3	13,300	22,900
EA3209D080	1¼"	1¼"		80	302.8	72	272.5	15,700	26,700
EA3209DT050*	1¼"	1¼"		50	189.3	45	170.3	13,300	22,900
EA3209DT080*	1¼"	1¼"		80	302.8	72	272.5	15,700	26,700

* T-Body Design

**Data for full flow in half coupling.

Straight Through 1½" Internal Valve with Electric Actuator EA3211D Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on pumping systems, and in-line installations. Installation is quick and easy and it fits in both full and half couplings, as well as, in-line applications.



EA3211D Series

Ordering Information

Part Number	Inlet M.NPT	Outlet F.NPT	Voltages	Closing Flow GPM, LPM				LP-Gas Vapor Capacity (SCFH/Propane)	
				Half Coupling		Full Coupling		25 psig Inlet (1.72 barg)	100 psig Inlet (6.89 barg)
				LP-Gas	NH ₃	LP-Gas	NH ₃		
EA3211D080	1½"	1½"	12/24 VDC	80 GPM 302.8 LPM	72 GPM 272.5 LPM	63 GPM 238.5 LPM	67 GPM 253.6 LPM	15,700	26,700
EA3211D110	1½"	1½"		110 GPM 416.4 LPM	99 GPM 374.8 LPM	84 GPM 317.97 LPM	76 GPM 287.7 LPM	N/A	N/A

Threaded Internal Valves with Electric Actuator For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks EA3212 Series

Designed primarily for use with LP-Gas and anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations.



EA3212R Series

Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Voltages	Closing Flow (GPM, LPM) Half Coupling		Closing Flow (GPM) Full Coupling		LP-Gas Vapor Capacity (SCFH/Propane)	
				LP-Gas	NH3	LP-Gas	NH3	25 psig (1.72 barg)	100 psig (6.89 barg)
EA3212R105	2"	2"	12/24 VDC	105 GPM	95 GPM	65 GPM	59 GPM	42,975	73,048
EA3212RT105		2" T-body		397.5 LPM	359.6 LPM	246.1 LPM	223.3 LPM		
EA3212R175		2"		175 GPM	158 GPM	100 GPM	90 GPM	48,169	81,876
EA3212RT175		2" T-body		662.4 LPM	598.1 LPM	378.5 LPM	340.7 LPM		
EA3212R250		2"		250 GPM	225 GPM	130 GPM	117 GPM	57,067	97,001
EA3212RT250		2" T-body		946.4 LPM	851.7 LPM	492.1 LPM	442.9 LPM		

Threaded Internal Valves with Electric Actuator For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks EA3213D Series

Designed primarily for use with LP-Gas and anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations.



Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connections F. NPT	Voltages	Closing Flow Half Coupling (GPM, LPM)		Closing Flow Full Coupling (GPM)		LP-Gas Vapor Capacity** (SCFH/Propane)	
				LPG	NH3	LPG	NH3	25 psig Inlet 1.72 barg	100 psig Inlet 6.89 barg
EA3213D150	3"	3"	12/24 VDC	150 GPM/567.8 LPM	135 GPM/511 LPM	125 GPM/473.2 LPM	113 GPM/427.8 LPM	26,900	45,900
EA3213D200				200 GPM/757.1 LPM	180 GPM/681.4 LPM	160 GPM/605.7 LPM	144 GPM/545.1 LPM	32,300	55,100
EA3213D300				300 GPM/1135.6 LPM	270 GPM/1022.1 LPM	250 GPM/946.4 LPM	225 GPM/851.7 LPM	50,500	86,500
EA3213D400				400 GPM/1514.2 LPM	360 GPM/1362.7 LPM	325 GPM/1230.3 LPM	293 GPM/1109.1 LPM	71,400	121,300
EA3213DT150*				150 GPM/567.8 LPM	135 GPM/511 LPM	125 GPM/473.2 LPM	113 GPM/427.8 LPM	26,900	45,900
EA3213DT200*				200 GPM/ 757.1 LPM	180 GPM/681.4 LPM	160 GPM/605.7 LPM	144 GPM/545.1 LPM	32,300	55,100
EA3213DT300*				300 GPM/1135.6 LPM	250 GPM/946.4 LPM	250 GPM/946.4 LPM	225 GPM/851.7 LPM	50,500	86,500
EA3213DT400*				400 GPM/ 1514.2 LPM	325 GPM/1230.3 LPM	325 GPM/1230.3 LPM	293 GPM/1109.1 LPM	71,400	121,300

* T-body design

1¼" Threaded Internal Valve for Small Capacity Pumping Systems and Bobtail Vapor Equalization A3209D & A3209DT Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on small capacity pumping systems, NH₃ nurse tanks and in-line installations. It may also be installed in the vapor equalizing opening on bobtail delivery trucks. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications. The valve may be actuated manually by hand or cable.



A3209PA



A3209DT



A3209D



A3209PAF



A3209TL

Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow (GPM, LPM)				LP-Gas Vapor Capacity** (SCFH/Propane)		Accessories	
			LP-Gas GPM	LP-Gas LPM	NH ₃ GPM	NH ₃ LPM	25 psig (1.72 barg)	100 psig (6.89 barg)	Thermal Latch	Pneumatic Actuators
A3209D050	1¼"	1¼"	50	189.3	45	170.3	13,300	22,900	A3209TL	A3209PA A3209PAF
A3209D080	1¼"	1¼"	80	302.8	72	1787	15,700	26,700		
A3209DT050*	1¼"	1¼"	50	189.3	45	170.3	13,300	22,900		
A3209DT080*	1¼"	1¼"	80	302.8	72	1787	15,700	26,700		

* T-Body Design

Straight Through 1½" Internal Valve A3211D Series

Designed primarily for use with LP-Gas and anhydrous ammonia as a main valve on pumping systems, and in-line installations. Installation is quick and easy and it fits in both full and half couplings, as well as, in-line applications. The valve may be opened manually by hand or pneumatic actuator.



A3211D

Ordering Information

Part Number	Inlet M.NPT	Outlet F.NPT	Closing Flow GPM, LPM				LP-Gas Vapor Capacity (SCFH/Propane)		Accessories	
			Half Coupling		Full Coupling		25 psig Inlet (1.72 barg)	100 psig Inlet (6.89 barg)	Thermal Latch	Pneumatic Actuator
			LP-Gas	NH ₃	LP-Gas	NH ₃				
A3211D080	1½"	1½"	80 GPM 302.8 LPM	72 GPM 272.5 LPM	63 GPM 238.5 LPM	67 GPM 253.6 LPM	15,700	26,700	A3209TL	A3209PAF
A3211D110	1½"	1½"	110 GPM 416.4 LPM	99 GPM 374.8 LPM	84 GPM 317.97 LPM	76 GPM 287.7 LPM	N/A	N/A		

Threaded Internal Valves For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks A3212 Series

Designed primarily for use with LP-Gas and anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations. The valve may be operated manually by cable or pneumatically.



A3212R Series

Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow (GPM, LPM) Half Coupling		Closing Flow (GPM, LPM) Full Coupling		A	B	C	Accessories		
			LP-Gas	NH3	LP-Gas	NH3				Thermal Latch	Pneumatic Actuator	Rotary Actuator
A3212R 105	2"	2"	105 GPM	95 GPM	65 GPM	59 GPM	1 9/16"	4 11/16"	3 45/64"	A3213TL	*A3213PA	A3212RA
A3212R T105		2" T-body	397.5 LPM	359.6 LPM	246.1 LPM	223.3 LPM		4 15/16"				
A3212R 175		2"	175 GPM	158 GPM	100 GPM	90 GPM		4 11/16"				
A3212R T175		2" T-body	662.4 LPM	598.1 LPM	378.5 LPM	340.7 LPM		4 15/16"				
A3212R 250		2"	250 GPM	225 GPM	130 GPM	117 GPM		4 11/16"				
A3212R T250		2" T-body	946.4 LPM	851.7 LPM	492.1 LPM	442.9 LPM		4 15/16"				

* For the old A3212A Series please use the A3212PA Pneumatic Actuator

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Threaded Internal Valves For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks A3213D Series

Designed primarily for use with LP-Gas and anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations. The valve may be operated manually by cable or pneumatically.



A3213RA



A3213D Series



A3213TL



A3213PA

Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connections F. NPT	Closing Flow Half Coupling (GPM, LPM)				Closing Flow Full Coupling (GPM, LPM)				Vapor Closing Flow (SCFH)		Accessories		
			LPG (GPM)	LPG (LPM)	NH3 (GPM)	NH3 (LPM)	LPG (GPM)	LPG (LPM)	NH3 (GPM)	NH3 (LPM)	25 psig Inlet (1.72 barg)	100 psig Inlet (6.89 barg)	Pneumatic Actuator	Rotary Actuator	Thermal Latch
A3213D150	3"	3"	150	567.8	135	511	125	473.2	113	427.8	26,900	45,900	A3213PA	A3213RA	A3213TL
A3213D200			200	757.1	180	681.4	160	605.7	144	545.1	32,300	55,100			
A3213D300			300	1136	270	1022	250	946.4	225	851.7	50,500	86,500			
A3213D400			400	1514	360	1363	325	1230	293	1109	71,400	121,300			
A3213DT150*			150	567.8	135	511	125	473.2	113	427.8	26,900	45,900			
A3213DT200*			200	757.1	180	681.4	160	605.7	144	545.1	32,300	55,100			
A3213DT300*			300	1136	250	1022	250	946.4	225	851.7	50,500	86,500			
A3213DT400*			400	1514	325	1363	325	1230	293	1109	71,400	121,300			

* T-body design

Remote Cable Controls for Internal Valves 3200C and 3200L

The 3200C Remote Cable Kit is designed especially for use with the 3200L Remote Operating Lever to operate internal valves from a remote location.

The internal valve is opened by pulling back the remote operation lever and closed by returning the lever to its original position. A remote release is provided to close the internal valve from a different remote location.



3200L

Ordering Information

Part Number	Description	Contents
3200C	Remote Cable Kit	100 Foot Cable, 6 Cable Clamps, Quick Link, Sign, Fuse Link, Steel Nut and Bolt
3200L	Operating Lever	Lever Assembly

3" Flanged Internal Valves for Bobtail Delivery Trucks, Transports and Large Stationary Storage Containers A3217A & A3217DA

Designed primarily for LP-Gas and anhydrous ammonia filling and/or withdrawal on MC331 bobtail delivery trucks, transports and stationary storage tanks with flanged pumps or piping. Installation is quick and easy, and the valve may be operated manually by cable or pneumatically. Lever available on right or left side to allow for installation without the use of an extra pulley.



A3217AR

A3217ARPA and A3217ALPA Pneumatic Actuators

These Pneumatic Actuators are designed specifically for use with the A3217 Series 3" Internal Valves. The diaphragm design provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen.

Ordering Information

Part Number		Operating Lever Position	Inlet Connection	Outlet Connection	Closing Flow GPM, LPM				Accessories	
					LP-Gas GPM	Lp-Gas LPM	NH3 GPM	NH3 LPM	Pneumatic Actuator	
									Right Operation	Left Operation
Single Flange										
A3217AR160	A3217AL160	Right or Left	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	160	605.7	145	548.9	A3217ARPA A3217RA	A3217ALPA A3217LA
A3217AR210	A3217AL210				210	794.9	190	719.2		
A3217AR260	A3217AL260				260	984.2	236	893.4		
A3217AR410	A3217AL410				410	1552	372	1408		
A3217AR510	A3217AL510				510	1931	459	1738		
Double Flange										
A3217DAR160	A3217DAL160	Right or Left	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	160	605.7	145	548.9	A3217ARPA A3217RA	A3217ALPA A3217LA
A3217DAR210	A3217DAL210				210	794.9	190	719.2		
A3217DAR260	A3217DAL260				260	984.2	236	893.4		
A3217DAR410	A3217DAL410				410	1552	372	1408		
A3217DAR510	A3217DAL510				510	1931	459	1738		

* Valve supplied with 16 nuts and 8 studs for mounting.

**Modified bore=4 1/2" diameter with 5 1/2" diameter raised face.

4" Flanged Internal Valve for Transports and Large Stationary Storage Tanks A3219 Series

Designed primarily for LP-Gas and anhydrous ammonia service on MC331 transport pressure vessels and large stationary storage tanks. Installation is quick and easy, and it fits in most existing tank flanges. The valve may be actuated manually or pneumatically.

Use of the A3219RT Remote Thermal Release with this valve is suggested to provide a remote means of mechanical closure along with thermal protection, as required by DOT.



A3219FA



A3219FPA

A3219FPA Pneumatic Actuator

The A3219FPA Pneumatic Actuator is designed especially for use with the A3219FA Series Flanged Internal Valves. The diaphragm type A3219FPA provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen, on LP-Gas and NH3 transport trailers and stationary tanks.



A3219RA

Ordering Information

Part Number*	Inlet Connection	Outlet Connection	Closing Flow GPM, LPM***				Accessories	
			LP-Gas GPM	LP-Gas LPM	NH3 GPM	NH3 LPM	Pneumatic Actuator	Remote Thermal Release
A3219FA400L	4" 300# ANSI RF Modified Flange**	4" 300# ANSI RF Flange	400	1514	360	1363	A3219FPA A3219RA	A3219RT (2)
A3219FA600L			600	2271	540	2044		
A3219FA600W			400	1514	360	1363	-	A3219W

* Valve supplied with 16 nuts and 8 studs for mounting.

** Modified bore = 5 7/8" diameter with 7" diameter raised face.

*** Other closing flows available

Remote Thermal Release for DOT MC331 Pressure Vessel A3219RT

Designed especially for use with Internal Valves installed in DOT MC331 pressure vessels. The A3219RT provides a remote means of mechanical closure along with thermal protection, as required by DOT MC331.

The A3219RT is connected by cable to the internal valve(s) on the vessel. In the event of extreme heat (over 212° F.), the fuse link will melt, causing the spring to contract and pull the cable. When properly installed the cable will trip the internal valve release lever(s) allowing the connected handle(s) to move to the closed position.



A3219RT

Ordering Information

Part Number	For Use With	Release Temperature	Spring Load		Minimum Number Required By MC331
			Fully Extended	After 4" Travel	
A3219RT	Internal Valves	212° F.	≈100 lbs.	≈50 lbs.	2

Flomatic® Internal Valves for Bobtail Delivery Trucks, Transports and Large Stationary Storage Tanks A7883FK

Designed primarily for LP-Gas and anhydrous ammonia liquid withdrawal on MC331 bobtail delivery trucks, transports and large stationary storage containers with flanged connections. The valve is fully automatic, opening and closing as the pump is turned on or off.



A7883FK

Ordering Information

Part Number	Inlet Connection ANSI Flange	Outlet Connection ANSI Flange	Strainer Width	Base Width	Overall Height (Approx.)	Height from Indicator to Base	Accessories (included with Flomatic®)	
							Filter	3-Way Valve
A7883FK*	3"-300#**	3"-300#	4¾"	8¼"	10½"	4 ¹³ / ₁₆ "	A7884-201	A7853A

*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.

**With 4¹/₁₆" diameter bore.

¼" Three-Way Quick-Acting Valve A7853A



A7853A ¼" Three-Way Quick-Acting Valve

Ordering Information

Part Number	Flange Type	A	B	C	D	Accessories	
						Pneumatic Actuator	3-Way Valve
A7853A*	T-1 Steel Carbon Steel	4 ¹³ / ₁₆ "	5¾"	6 ⁵ / ₈ "	8¼"	A7853PAF	A7853PA

*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.

**With 4¹/₁₆" diameter bore.

Electrically Actuated 3 way valve EA7853A

The EA7853A 3-way quick acting valve controls the fluid exchange between three separate transfer lines. For better control, the 3-way valve is paired with an electric actuator which provides a safe, easy way to open and close the valve from a remote location.



EA7853A

Ordering Information

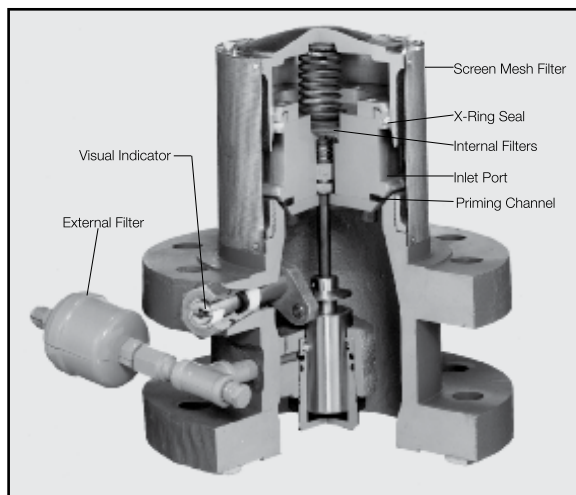
Part Number	Flange Type	Voltages
EA7853A	T-1 Steel Carbon Steel	12/24 VDC

*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.

**With 4¹/₁₆" diameter bore.

***With 5¹/₁₆" diameter bore.

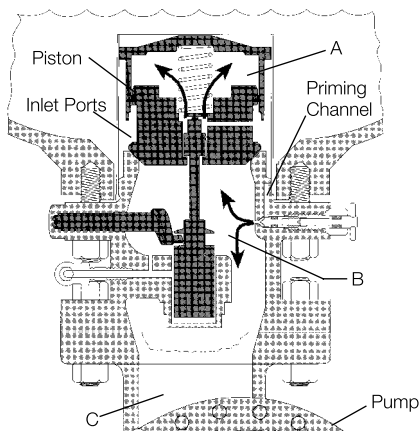
Flomatic® Internal Valve Operation



1. Normally Closed

When the valve is closed, liquid flows into the INLET PORTS, through a channel in the PISTON, and into area A. It also flows down through the PRIMING CHANNEL in the valve body, into area B beneath the valve seat, and into area C to prime the PUMP.

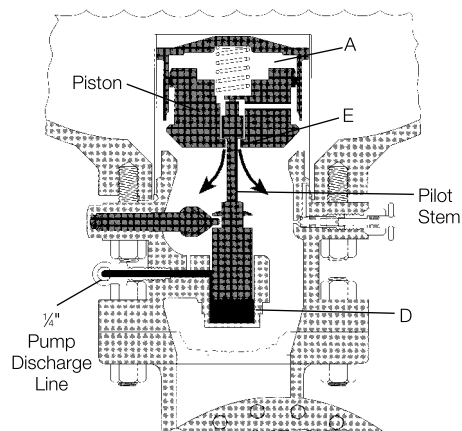
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2. Pump On – Valve Opening

When the pump is started, differential pressure transmits through the 1/4" piping into chamber D. lifting the PILOT STEM. This opens the seat between the stem and piston at E. Pump suction then evacuates the tank pressure in area A, which becomes equal to the pump suction pressure.

2



General Information

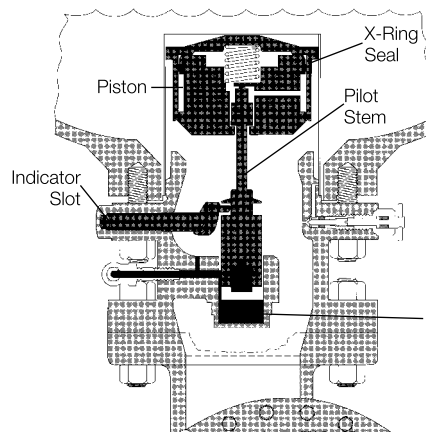
RegO piston type Flomatic Internal Valves are normally closed and use pressure differential to provide completely automatic service. Mounted directly between the tank body and pump, the Flomatic® uses the pressure differential developed by the pump to open the valve and it closes automatically when the differential no longer exists.

This means the RegO Flomatic opens when the pump is on and closes when the pump is shut off – fully automatic.

3. Pump On – Valve Open

The force below the pilot stem forces the piston up to open the valve; rotating the INDICATOR SLOT to its vertical (valve open) position. Pump differential pressure in area D holds the PILOT STEM and PISTON open. Approximately 20 psig (1.38 barg) pump differential pressure is required to open the valve; approximately 8 psig (0.55 barg) differential pressure will hold the valve open.

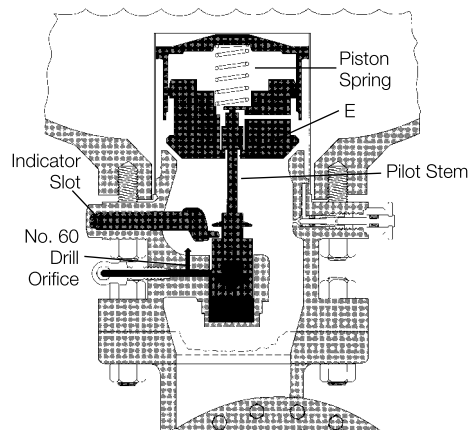
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4. Pump Off – Valve Closes

With the pump shut off, the pressure in area D which holds the valve open, bleeds out through the #60 DRILL ORIFICE. This loss of pressure permits the SPRING to push the PILOT STEM down to reseat at point E. Since pressures are equal above and below the PISTON, with no sustaining pressure in area D, the SPRING forces the valve closed. The INDICATOR SLOT rotates to the horizontal (valve closed) position.

4



On-The-Job Service Guide for the Flomatic® Valve

Introduction

Efficient, profitable transport and delivery truck operations depend on keeping the equipment working safely and efficiently under changing conditions. It is important to know how to eliminate expensive delays by handling unloading problems as they arise.

The purpose of this technical guide is to provide basic information on the Flomatic® valve, along with simple, appropriate steps to follow in the event things go wrong.

The Flomatic® valve is mounted on the bottom of your transport or delivery truck tank, with the pump mounted immediately downstream. When the pump starts to push the liquid down the piping, the Flomatic® Valve opens automatically, allowing you to unload the tank, and closes when the pump stops pushing. It takes at least 20 pounds per square inch (1.38 barg) of "push" at the pump to open the valve.

Your flanged Flomatic® valve has an indicating shaft on it that shows whether it's open or closed (Figure 1). If the indicating shaft is horizontal, the valve is closed. If it's vertical, the valve is open.

A threaded type, diaphragm-operated Flomatic® valve has an indicating shaft on the bottom, covered by a clear plastic hood. The indicating shaft projects down when the valve is closed and is concealed when the valve is open (Figure 2).

Important Facts About Pressure

When handling propane or anhydrous ammonia, storage and transport tank pressures vary from about 20 pounds per square inch (1.38 barg) or less when it's cold to 200 pounds per square inch (13.79 barg) or more in hot weather (Figure 3). If you're hauling butane, tank pressures will be 50 pounds per square inch (3.45 barg) or less.

The transport or delivery truck tank pressure may be higher than the storage tank pressure when you are ready to unload (Figure 4). This is because your rig may have been freshly loaded at the terminal or bulk plant without a vapor equalizing line and hasn't had time to get back to normal. Also, the storage tank pressure tends to drop when a lot of LP-Gas is being used.

Troubleshooting on the Job

O.K. So you follow your procedures, hook up your hoses, open the required valves and start your pump. The indicating shaft on the Flomatic® valve moves to the open position and the liquid goes in to storage. Great! You're happy and so is the boss, and so are we.

But, let's say you do these things, start the pump and the liquid doesn't move. Now, how do you find out what is wrong?

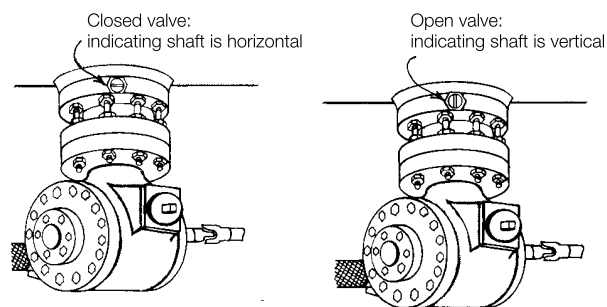


Figure 1. Flanged Flomatic Valve

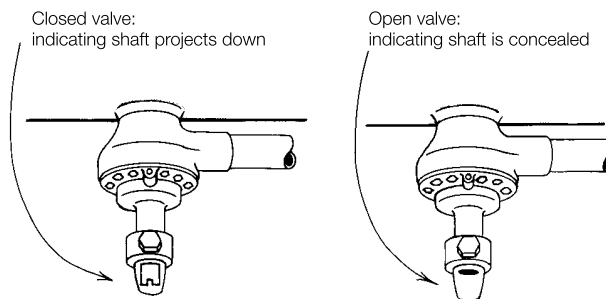


Figure 2. Threaded, Diaphragm-operated Flomatic Valve

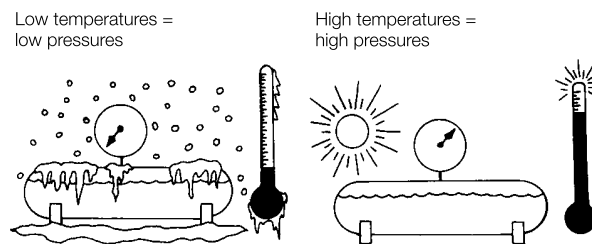


Figure 3. Weather Conditions Affect Pressure

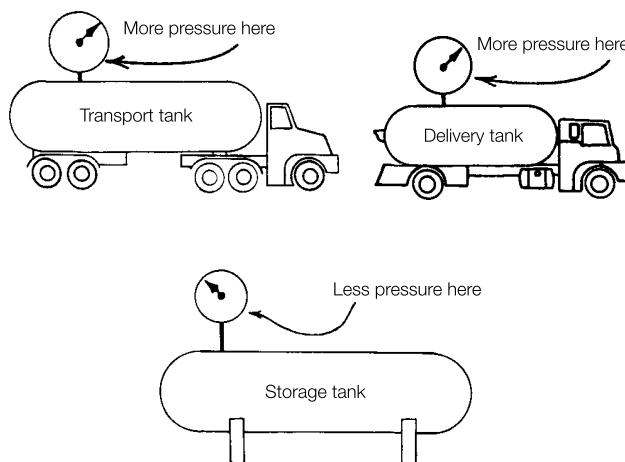


Figure 4. Unloading Conditions Affect Pressure

On-The-Job Service Guide for the Flomatic® Valve

Step 1

Immediately shut down the pump so you don't cause possible damage to the seals or valves. Next:

1. Check all manual valves in the system to make certain they are open or closed as required for proper operation.
2. Check the liquid level in the transport or delivery tank. If the level is low, it may slow the transfer rate.
3. Check to ensure that the pump rotates normally when power is applied. If not, inspect and repair as needed the power takeoff, universal joints, drive shaft and clutch, etc.
4. Make sure the lever is straight out on the ¼" operating valve in the line between the pump discharge line and the Flomatic® valve (Figure 5). If it isn't, the Flomatic® valve will remain closed.
5. Make certain the priming valve on the side of the Flomatic® valve is open (Figure 6).

6. Ice in the system may prevent proper operation, as will a collapsed or kinked sensing line or a clogged sensing line filter. If you found the trouble within STEP 1, just start the pump and continue unloading. If not, proceed accordingly.

a. New Models with T-handle: To adjust to the proper position, push in the end of the valve stem and tighten the needle valve clockwise until it seats. Then, turn counterclockwise 1½ turns.

b. Old Models with Plug: To adjust to the proper position, carefully remove the plug. A small amount of liquid LP-Gas may be discharged when plug is loosened. Insert a small screwdriver and tighten the needle valve clockwise until it seats. Then turn it counterclockwise 1 turn only. **CAUTION: Do not open needle valve more than 1 turn as it might blow out!**

c. Threaded Models with Internal Priming Channel. The internal priming channel normally self-actuates. To be sure the system is primed, remove the plastic hood and push the travel indicator up about ¼" and hold for at least 15 seconds.

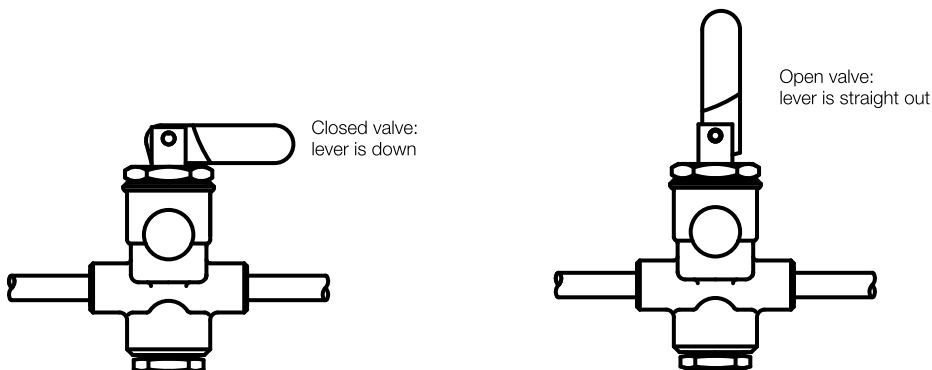


Figure 5. Operating Lever Positions

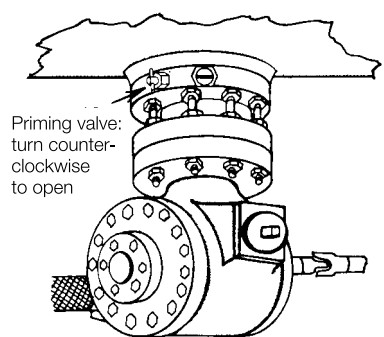


Figure 6. Priming Procedures

For Transport Trailer Trucks Only (Figure 7a)

1. Check the difference between the pressure in your transport and the storage tank. If there's 15 or 20 pounds per square inch more pressure in the transport tank than in the storage tank, chances are the Flomatic® valve won't open. This is because the pump can't develop enough "push."

If you have a good bypass valve on your rig to send the extra liquid back into the tank, you can merely close the liquid shut-off valve in the discharge line and restart your pump (Figure 8a). Now, the Flomatic® indicating shaft should move to the open position (see Figures 1 and 2).

2. Slowly open the liquid shut-off valve in the discharge line and the liquid will start to move out of the transport. If the Flomatic® valve indicating shaft starts to move toward the closed position once you've opened this liquid shut-off valve all the way, throttle the valve for a while until the transport tank pressure drops to where the Flomatic® valve indicating shaft will stay open. Then, open the liquid shut-off valve all the way until you finish unloading.

Step 2

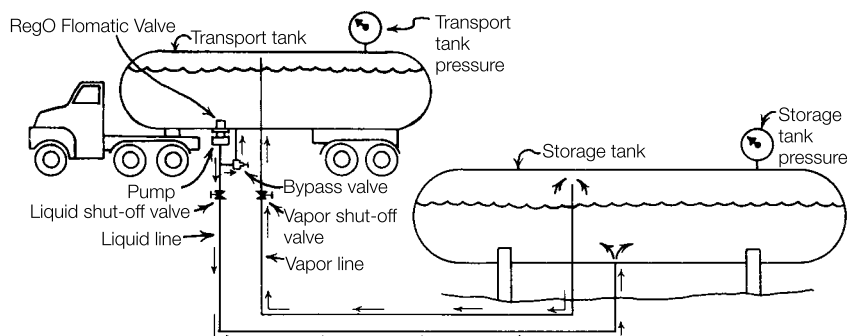


Figure 7a. Unloading Diagram of Transport Trailer Truck

The liquid flows out of the transport tank through the Flomatic® valve, into the pump and through the delivery hose to the storage tank. The vapor line allows vapor to flow from storage back to the transport so that the storage tank pressure won't build up too much and make the pump work harder than necessary.

On-The-Job Service Guide for the Flomatic® Valve

3. If your pump system doesn't have a bypass valve, the liquid shut-off valve in the discharge line should be left partially open when you restart the pump. Just be sure that the pump is pushing at least 20 pounds per square inch, so the Flomatic® valve can open.

Don't worry about how much it may slow up your loading speed when you pinch down the liquid shut-off valve to get the Flomatic® valve open. Your pump is running at constant RPM and will move liquid at almost the same rate, even when pushing harder. (It's a lot like using engine braking on a downhill grade, except, in this case, the pump keeps the liquid moving at a constant flow rate.)

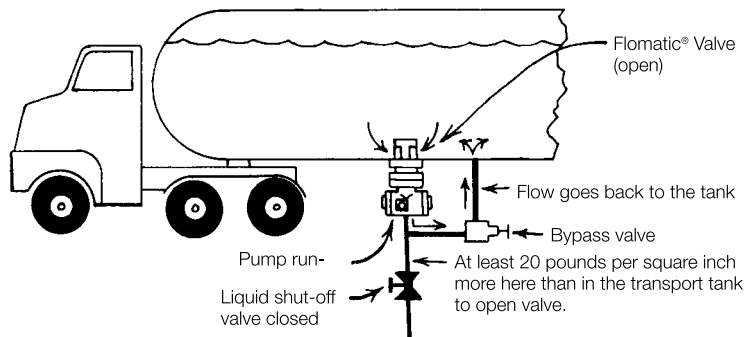


Figure 8a. Unloading Diagram of Transport Trailer Truck with Back-to-tank Bypass Valve
You must have a separate back-to-tank bypass valve if the pump is to be run with the liquid shut-off valve closed.

For Delivery Trucks Only (Figure 7b)

1. Check the pump bypass piping. If your truck is equipped with a manual bypass valve, close it and try the pump again. (Figure 8b). If the Flomatic® valve indicating shaft moves to the open position, the problem is that the pump can't develop 20 pounds per square inch or more to "push" open the Flomatic® valve with the bypass valve open. You can prevent this in the future by not opening the manual bypass valve too wide.

2. If the delivery truck is not equipped with a manual bypass valve, merely start the pump. Slowly close the shut-off valve between the back-to-tank bypass valve and tank. If the Flomatic® valve indicating shaft moves to the open position as you close the valve, the back-to-tank bypass valve may be stuck open, adjusted too low, or the spring may be broken. **CAUTION: Don't close the shut-off valve all the way, because excessive pressures and pump damage may occur.**

3. If the Flomatic® valve indicating shaft remains in the closed position, the problem is either in the pump or the Flomatic® valve.

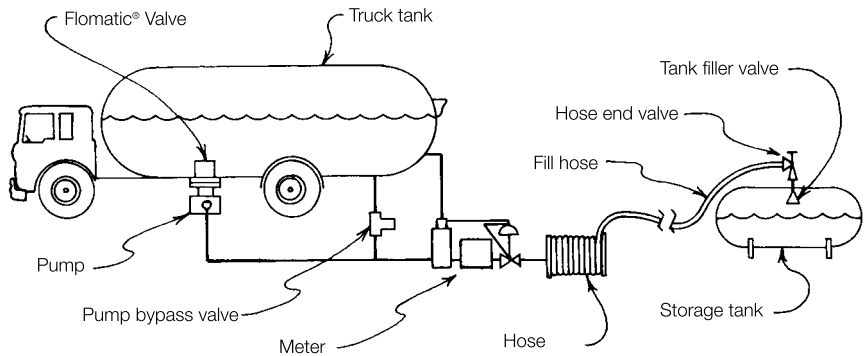


Figure 7b. Unloading Diagram of Delivery Truck

The liquid flows out of the truck tank, through the Flomatic® valve and into the pump, where it is then pushed through the meter and delivery hose into the storage tank. The liquid normally enters the vapor space of the storage tank to minimize pressure buildup, so a vapor equalizing line is usually not needed. The back-to-tank bypass valve opens to divert excess pump capacity back to the truck tank, preventing the pump from creating too much pressure.

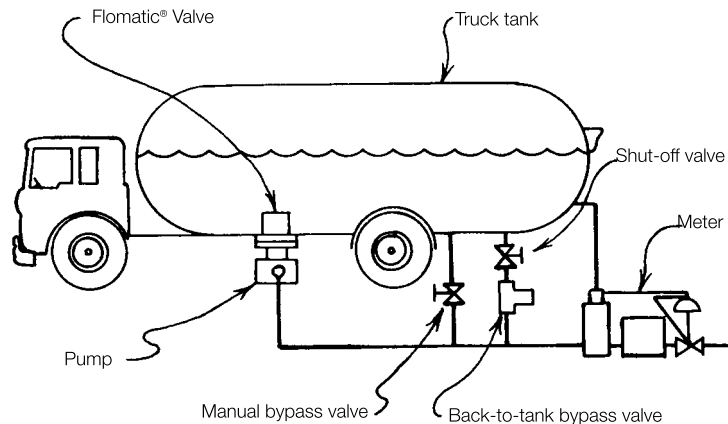


Figure 8b. Unloading Diagram of Delivery Truck with Manual Bypass Valve

USE EXTREME CARE AT ALL TIMES WHEN WORKING AROUND YOUR VEHICLE!
Watch out for drive shafts and moving parts. It is common knowledge that serious injury can result if any part of one's body or clothing is caught in moving machinery.

If you manually open the Flomatic® valve, you are responsible for safely unloading the liquid and closing the valve when you're through. If this procedure is being followed, under no circumstances must the valve be left unattended. The valve must never be permanently held in the open position.

If you are not able to cause the Flomatic® valve indicating shaft to move to the open position after completing the preceding steps, a complete detailed diagnosis will have to be made.

In the meantime, you can actuate the flanged Flomatic® valve by using a special wrench and attempt to unload manually (Figure 9).

If you still can't unload by following the preceding steps, it is suggested that you unload by an alternate method, such as through the valve normally used for liquid filling.

In any event, if you haven't solved the problem and the unit still doesn't operate properly, immediately take it out of service, have a complete analysis made and repair as needed.

Be sure to obtain and keep available for quick referral the Manufacturers' Operation and Service Manuals for the valves, pump, meter and all operating equipment in the system.

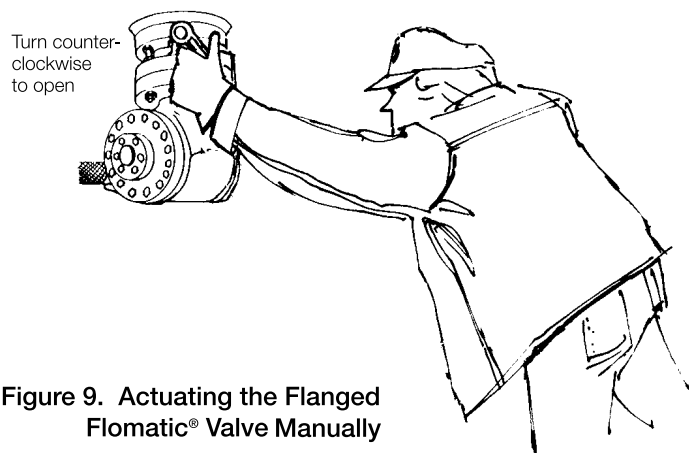


Figure 9. Actuating the Flanged Flomatic® Valve Manually

Pumping System Troubleshooting Guide

Introduction

Most LP-Gas and anhydrous ammonia systems use pumps to move liquid from one location to another. Unloading transport trailer tanks into plant storage, loading delivery trucks, filling bulk tanks, engine fuel tanks, portable cylinders, etc. and pressurizing LP-Gas vaporizers are only a few of many such applications. A well-designed and properly installed pumping system will perform well for some time, but eventually problems occur requiring attention.

Finding out what is wrong, and getting it working again, can be a time-consuming and confusing experience, unless one knows clearly how to proceed.

The purpose for this technical guide is to provide simple, step-by-step guidelines for correcting LP-Gas and anhydrous ammonia pumping difficulties.

The procedure includes a preliminary checklist to help find out if the difficulty can be corrected without taking anything apart. Then, it shows how to zero in on more serious problems by using a few pressure gauges to pinpoint the cause.

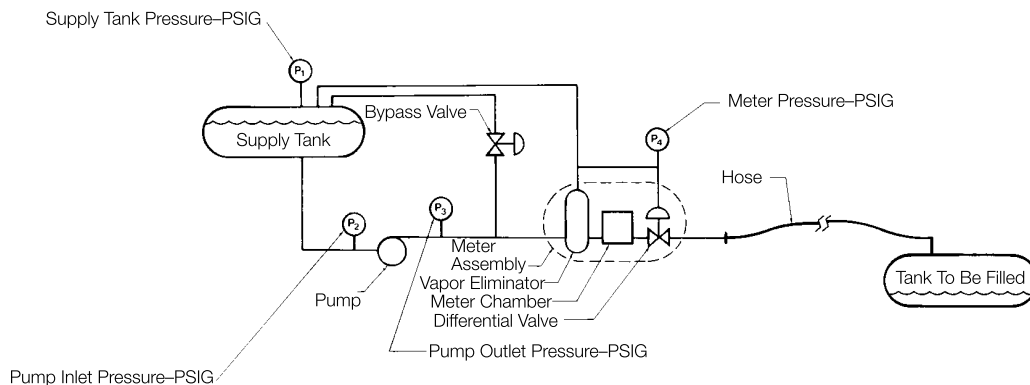
It is recommended that the pumping system be equipped for easy pressure gauge installation before trouble occurs. Small manual shutoff valves can be installed at proper locations, with plugs inserted in the outlets.

This would allow pressure gauges to be put in easily without removing the LP-Gas or anhydrous ammonia from the system at the time trouble occurs, saving a lot of time and unnecessary expense. Pressure gauges should be installed temporarily at the time the system is first installed, and pressure readings recorded while the system is working properly. Then, in many cases, merely comparing pressures with original readings may tell what the trouble is.

NOTE: The figure below shows where pressure gauges should be installed. Pressure gauge readings from the original tests should be recorded for each gauge.

It is recommended that the pressure gauges not be used continuously, because vibrations and the ravages of weather cause their damage or ruin. Therefore, as soon as the initial tests are complete, it is best to (1) close the shutoff valves, (2) remove the gauges, (3) plug the valves and (4) keep the gauges in a safe place, ready for troubleshooting when really needed. It is easier to diagnose a problem if the original test results are available, but don't panic if they aren't. You can still solve the problem without this information, but it requires more time and effort.

Pump System Schematic



A



Tank Pressure doesn't change



Pump Inlet Pressure decreases



Pump Outlet Pressure doesn't change

The trouble is most likely somewhere in the inlet line. It could be:

1. The pump may be running at a speed too low to develop proper differential pressure.
2. An inlet strainer is clogged.
3. A valve is partially closed somewhere in the inlet line.
4. Ice has formed either in the bottom of the supply tank or somewhere in the inlet line. This is common particularly when the tank has been hydrostatically tested or purged with steam, and not completely drained and dehydrated.
5. If a Flomatic® valve is used, it may not be opening for a number of reasons.
 - a. Pressure in the tank to be filled may be considerably less than that in the supply tank, making it impossible for the pump to develop sufficient differential pressure to open the valve (Simply throttle a manual valve on the discharge line to cause the pump

to develop enough differential pressure to open the Flomatic® valve. As the pressure in the tank to be filled goes up, it will be possible to re-open the valve in the discharge line.)

- b. The pump by-pass valve may be blocked open or have broken or damaged parts, preventing the pump from developing sufficient differential pressure to open the Flomatic® valve. (Pump outlet pressure must rise at least 21 PSI to open the Flomatic® Valve.)
- c. The Flomatic® strainer, filter, three-way valve or other element in the actuating line is clogged, or the actuating line is kinked.
- d. The Flomatic® valve internal parts may be damaged or worn. (Refer to Installation Manual #A7884F-301 for flanged valves or #L-451 for diaphragm-type threaded valves for repair instructions.)
6. If an internal valve is used, the main valve may not be opening due to insufficient equalization time, broken or damaged valve parts, valve lever in closed position or insufficient excess flow sizing.

NOTE: Meter pressure is not needed for this condition.

B



Tank Pressure doesn't change



Pump Inlet Pressure doesn't change



Pump Outlet Pressure goes up a little

The trouble is most likely related to the pump or by-pass valve. It could be:

1. The pump may have excessively worn parts.
2. The internal by-pass valve in the pump may be blocked open by foreign material, or may have broken or damaged parts.
3. The back-to-tank by-pass valve may be blocked open by foreign material, or may have broken or damaged parts.
4. The manual by-pass valve, is so-equipped, may be open.

NOTE: Meter pressure is not needed for this condition.

Pumping System Troubleshooting Guide

Be sure to obtain and keep available for quick referral the Manufacturer's Operation and Service Manuals for the valves, pump, meter and all operating equipment in the system.

To avoid delays, maintain a complete stock of recommended spare parts on hand for quick repairs.

Follow the steps as shown. Don't assume the answer is known beforehand, or skip any applicable steps. Rather, be thorough and methodical and in most instances, you will solve the problem. On the

other hand, if you have done all of this and still haven't worked out your problem, feel free to call your local distributor or RegO

direct. We will do our best to help. Perhaps, between us, we will be able to solve your problem and add something new to the procedure which could help everyone in the future.

Pumping System Troubleshooting Chart

BASIC ASSUMPTION

The pumping system did work OK, but now the transfer rate is considerably less, or the system won't pump at all.

PRELIMINARY REVIEW

1. Check the supply tank liquid level. The transfer rate could be considerably reduced if the level is low, due to vapor bubbles in the line, because of insufficient liquid head, or a vortex effect in the tank. Remember, reduction in the pumping rate from these causes will be more extreme in cold weather when tank pressures are low.
 2. Examine the pump drive to make sure the pump is rotating properly. Inspect for loose drive belts, damaged or broken flexible couplings or universal joints, broken drive keys and damaged or inoperative power take-off or pump clutch, etc.
 3. If the system is equipped with the Flomatic® Valve:
 - a. Make sure the three-way valve handle is straight out, allowing the valve to open.
 - b. Check the position indicator on the Flomatic Valve when the pump is running. If the indicator shows that the valve is open, the trouble **must** be downstream of the valve.
 4. If the system is equipped with internal valves, make sure the operating lever moves to a full open position. Repair if needed.
 5. Make sure all valves in the system are either open or closed as required for normal operation. Check each valve in sequence, starting from the supply tank, making sure that no valve element is missed.
- If the cause of the problem has not been determined during preliminary review, it will be necessary to conduct diagnostic tests, using pressure gauges at key points in the system. (See Introduction, Page 1.)

DIAGNOSTIC TESTS

Open all valves as required for proper pumping operation. Gauges should show tank pressure, pump inlet pressure, pump outlet pressure and meter pressure to be equal.

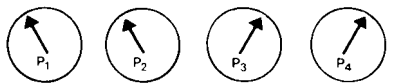
Start the pump and observe all pressure gauges. Match results with conditions A, B, C, or D. Follow the appropriate steps.

FINAL RESULTS

Make repairs or adjustments as needed, and test the system's operation. Record a new set of test pressures for future reference, and order replacements for all spare parts used.

The system is now ready to return to service.

C



Tank Pressure doesn't
Pump Inlet Pressure doesn't change
Pump Outlet Pressure rises substantially
Meter Pressure rises substantially

The trouble is most likely in the meter vapor eliminator or meter differential valve. It could be:

1. The meter's vapor eliminator may be malfunctioning. If the valve at the outlet of the vapor eliminator does not seat when the vapors have been purged, the differential valve downstream of the meter will not open. Such failure could be caused by a damaged vapor eliminator valve seat, foreign material blocking the vapor eliminator valve, a leak in the ball float, or a jammed or binding linkage between the ball and valve.
2. The diaphragm could be ruptured, or other parts could be damaged or broken in the differential valve downstream of the meter.

D



The problem is most likely somewhere downstream of the pump. Look for a closed valve, or some type of blockage in the discharge line. It could be:

1. The meter strainer may be clogged.
2. A back check valve at the inlet of the meter may be blocked, closed, or jammed.
3. The meter rotor may be jammed by foreign material, preventing it from moving properly, which would prevent or retard flow.
4. The drive key on the meter gears may be sheared. (In this case, flow would actually be moving through the meter but not registering.)
5. The differential valve downstream of the meter may be closed due to damage, foreign material or ice.
6. If screw type hose fittings are used, it is extremely important that they be installed properly. If not, it is possible that a flap of rubber may be cut from the inside diameter of the hose, acting as a back check. It can flap across the discharge line, effectively stopping the flow.
7. Check the hose nozzle valve, if so equipped. In some brands, a bent handle or other defect may prevent the inner valve from opening sufficiently to allow a proper amount of flow.
8. The problem could be in the valve assemblies in the tank to be filled.
9. Some delivery trucks are equipped with a quick-acting valve immediately upstream, of the hose reel. **Make sure** that this valve is open.
10. Some delivery trucks are equipped with excess flow valves between the meter and hose reel. Improper sizing, a weak spring, or other valve damage can cause this valve to close prematurely, effectively stopping the flow.
11. If, with a delivery truck system, the flow reduced considerably while the tank is being filled, it is possible that the back-to-tank by-pass valve is not set high enough to compensate for vapor pressure buildup in the tank being filled. This can be solved merely by adjusting the by-pass valve as a slightly higher level. **Warning:** Do not raise the back-to-tank by-pass setting high enough to cause the internal relief valve in the pump to actuate. If this should happen, it could cause excessive cavitation, loss of capacity and premature pump wear.

FINAL RESULTS

Make repairs or adjustments as needed, and test the system's operation. Record a new set of test pressures for future reference, and order replacements for all spare parts used. The system now is ready to return to service.

Extended Type Hose Couplings for Vapor and Liquid Service A7571 and A7575 Series

Designed especially for liquid filling and vapor equalization of LP-Gas and anhydrous ammonia. The limited travel of the handle on the tailpiece minimizes spin-off, encouraging cautious removal to properly bleed off trapped product to ensure closure of the filler valve and hose end valve. The ACME threads are machined on a rugged steel insert which is permanently cast in the aluminum handle, providing for durability under repeated use.



A7571 Series



A7575 Series

Ordering Information

Part Number	Type of Service	A. Hose Connection (M. NPT)	B. Coupling Connection (F. ACME)	C. Approx. Length
A7575L2*	Liquid	1/2"	1 3/4"	7"
A7575L3		3/4"		
A7575L4		1"		
A7575L5**		1 1/4"		
A7571LA	Vapor	1/2"	1 1/4"	
A7571LB		3/4"		

* Includes 7199-33 adapter, shipped loose.

** Includes A7575L5-1 adapter, shipped loose.

Short Type Hose Couplings for Vapor and Liquid Service 3171, 3175, 3181, 3185 and 3195 Series



3175 Series



A3185 Series



3171A Series



3191 Series

Ordering Information

Part Number	Material	Style	A. Hose Connection (M. NPT)	B. Coupling Connection (F. ACME)	C. Tailpiece Bore	D. Hose End To Nut	E. Overall Length
3175B	Brass	A	1/2"	1 3/4"	35/64"	1 13/16"	2 11/16"
3175			3/4"		3/4"		
3175A			1"		15/16"		
3185			1 1/4"		1 3/16"		
3195	Brass Nut & Steel Nipple	B	2"	3 1/4"	7/8"	2 1/4"	3 5/8"
A3175	Steel	A	3/4"	1 3/4"	3/4"	2"	2 7/8"
A3175A			1"		7/8"	2 1/4"	3 1/8"
A3185		B	1 1/4"	2 1/4"	1 1/4"	2 5/8"	3 3/16"
A3195			2"	3 1/4"	1 7/8"	2 1/4"	3 5/8"
3171	Brass	C	3/8"	1 1/4"	3/8"	1 17/32"	2 13/32"
3171A			1/2"		31/64"		
3181			3/4"	1 3/4"	3/4"	1 3/16"	2 11/16"
3181A			1"		3/4"	1 1/8"	2 3/4"
3191			1 1/4"		1 3/16"	2 1/8"	3 1/16"
		D		2 1/4"			

ACME Check Connectors for Lift Trucks 7141F and 7141M

These brass connectors are especially designed to join the carburetor fuel line to the service valve on lift truck cylinders. Sturdy, long lasting ACME threads allow quick, hand-tight assembly that provides for quick and simple cylinder replacement. Back checks automatically close in each connector when disconnected.

The 7141M couples directly to the service valve. An integral O-ring is designed to seal before the internal check opens, aiding in product loss prevention. A gasket at the ACME thread is a secondary seal when the connectors are tightened together. The connector fits RegO lift truck cylinder filling adapters for fast, convenient filling.

The 7141F accepts fuel line adapter and couples directly to the 7141M. The O-ring seal in the 7141M is designed to seal before the internal check opens to allow product to pass through the connection. The knurled coupling eases threading and the ACME threads provide rapid effortless make-up, even against LP-Gas pressure.

NOTE: Refer to the "Cylinder and Service Valves" section of the L-500 catalog for additional information.



7141M



7141F

Ordering Information

Part Number	Application	A. Inlet	B. Outlet	Protective Cap*	
				Rubber	Brass
7141M	Service Valve	3/8" F. NPT	1 1/4" M. ACME	7141M-40	7141FP
7141F	Fuel Line	1 1/4" F. ACME	1/4" F. NPT	-	-

* Recommended to minimize foreign material entering valves which could result in leakage.

Unloading Adapters for Container Evacuation 3119A, 3120 and 3121

Designed to provide an efficient means of evacuating an LP-Gas container for relocation or repair. They thread directly onto the 1 3/4" ACME male hose connection of RegO Filler Valves used on RegO Double Check Filler Valves and Multivalves®.

The unloading adapters can be used to withdraw liquid provided the container is equipped with a dip pipe extending from the filler valve to the bottom of the container.



3120



3121



3119A

Ordering Information

Part Number	Style	A. Filler Valve Connection	B. Hose Connection
3119A	In-Line	1 3/4" F. ACME	1 1/4" M. ACME
3120	Angle		3/4" F. NPT
3121			

Left Hand Thread ACME Connectors for Vapor Withdrawal Industrial Cylinders 7142LF and 7142LM

These brass connectors are especially designed to join the carburetor **vapor fuel** line to the service valve on industrial cylinders especially designed for and used on propane fueled lawn mowers. Sturdy long lasting ACME **left hand** threads provides for quick hand tight assembly that provides for quick and simple cylinder replacement.



7142LM



7142LF



Ordering Information

Part Number	Application	Inlet	Outlet	Protective Cap
7142LM	Vapor Service Valve	3/8" F.NPT	1 1/4" M.ACME –left hand	7141M-40
7142LF	Vapor Fuel Line	1 1/4" F.ACME –left hand	1/4" F.NPT	-

Filler Hose Adapters 3179B, 7577V and 7576

These adapters are designed with minimal flow restriction and recommended for use on the outlet of the LP-Gas delivery truck filler hose. If the controlled bleed off of the connection indicates the filler valve on the tank being filled has failed to close, the hose adapter should be left in place on the filler valve and disconnection should be made at the regular filler hose coupling. (Repair of the filler valve must be made as soon as possible). An integral check valve in these adapters helps prevent further loss of product. The standard filler valve cap should be attached to these adapters when left on the container.



3179A



3179B



7576



7577V

Ordering Information

Part Number	Built-in Vent Valve	A Filler Valve Connection	B Hose Connection
7577V	Yes	1¾" F. ACME	1¾" M. ACME
3179A	No		
3179B			
7576	Yes		

POL Plugs

Highly recommended for installation in LP-Gas cylinder valve POL outlets whenever the service line is disconnected or when the cylinder is being transported.

When properly installed, the POL plug is designed to prevent contamination of the valve outlet and guards against product leakage if the cylinder valve is accidentally opened.



N970P



10538P

(Has hole for attaching wire to prevent loss of plug)

Ordering Information

Part Number	Material	Connection
N970P	Cyclac	M. POL (CGA 510)
10538P	Brass	
3705RC		

3 1/4" M.ACME X 2" M.NPT Adapter with Vent Valve & Integral Screen 5769HVB

Designed to prevent debris from impeding the action of valves and components of LPG piping systems at bulk plants and industrial plants.



5769HVB

Ordering Information

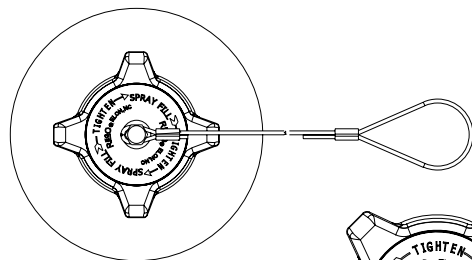
Part Number	Style	Gasket Qty	Vent Valve	Hex Size	Thread	"A" Length
5769H	1	1	-	3 1/4"	2" M.NPT	2.875
5769K	1	1		3 1/2"	3" M.NPT	3.625
5769M	2	2		3 1/4"	3 1/4" ACME	2.750
5769HVB	1	1	3165CBT		2" M.NPT	3.150
5769VSS	1	1	TSS3169			3.150

Caps and Reducers

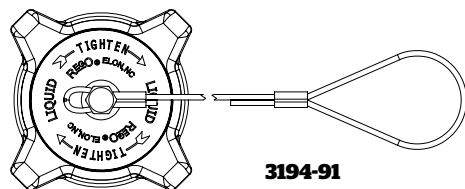
Ordering Information

Cap With Chain & Ring		Cap Only Part Number	Material	Thread Connection
Part Number	Ring Fits Pipe Size Up To:			
3144-91	¾"	3144-9P	ABS	1¼" F. ACME
3174-91		3174-9P		1¾" F. ACME
3174-93			A8016-9P	
A8016-93				
1708C	¾"	-	Brass	F. POL (CGA 510)
7141FP	-			1¼" F. ACME
3175P	1¼"			1¾" F. ACME
A3175P			Steel	2¼" F. ACME
3184-90			Brass	3¼" F. ACME
3194-90				
-			-	5776*
A3184-90			-	3¼" F. ACME
A3194-90			Steel	
-			A5776*	
907FP		1"	Brass	1 ¹⁵ / ₁₆ " F. ACME
3194-90G	-	3¼" ACME		
3194-90GS	Adjustable Cable			
3194-91L				
3194-91S				
3194-91V				
A3194-91L				Steel
A3194-91S				
A3194-91V				
5778	3¼ F. ACME			Brass

* Reduces to 1 1/4" M. ACME

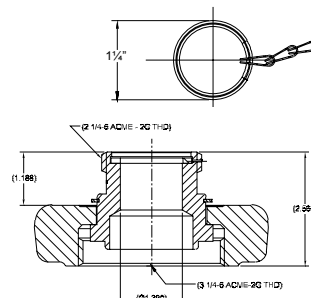


3194-90GS

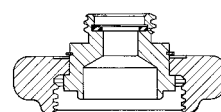


3194-91

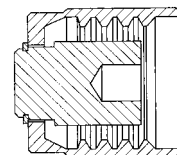
L=Liquid (Red)
S=Spray Fill (Yellow)
V=Vapor (Yellow)



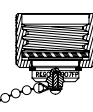
5778



A5776
Reducer Coupling

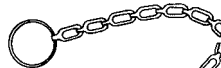


7141FP Cap Plug



907FP

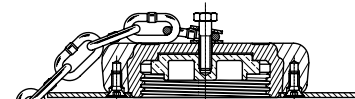
1708C POL Cap



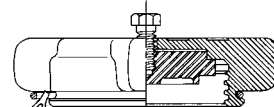
CGA 510



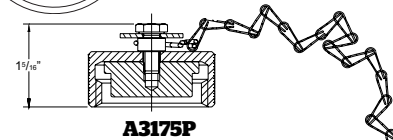
3175P Cap Plug



3194-90G
ACME Cap with Stainless
Steel Flange



3144-90
Metal Cap



A3175P

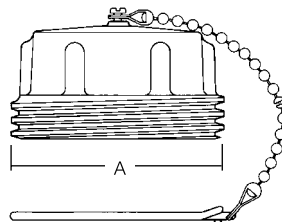
ACME Plugs

Specifically designed to withstand the everyday abuse given to hose end valves on delivery trucks and hose end couplings on risers in bulk plants, these rugged plugs protect the coupling tip as well as prevent the entrance of dirt, dust, snow and rain. They also prevent possible gas contamination from these same sources. The heavily ribbed outer surface permits hand-tight make-up.

These plugs are available in a choice of four sizes which may be used with liquid as well as vapor type couplings. As a convenience, the nylon plugs have a retaining chain and ring to prevent loss during a transfer operation.

All are suitable for LPG or anhydrous ammonia service except the brass 5765PR, which is for LP-Gas only.

Not intended for use as pressure closures.



C5763N

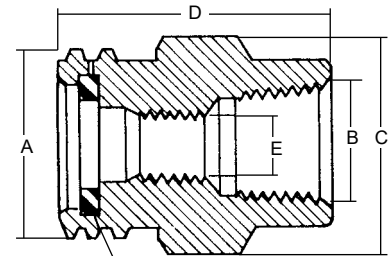
Ordering Information

Part Number	Material	A (M. ACME)	Chain & Ring Fits Pipe Size Up To:
C5763N	Nylon	1 1/4"	3/4"
C5765N		1 1/4"	1 1/4"
5765PR	Brass	1 1/4"	Not Applicable
C5767N	Nylon	2 1/4"	1 1/4"
C5769N		3 1/4"	2"

ACME Adapters

Ordering Information

Part Number	Material	A M. ACME	B FNPT	C Hex	D Overall Length	E Diameter	For Spare Gasket Order Part No.
5764A	Brass	1¾"	¼"	1¾"	1¾"	13/32"	A2697-20R
5764B			⅜"		123/32"	9/16"	
5764C			½"		1¼"	11/16"	
5764D			¾"		19/32"	29/32"	
5764E			1"		1⅞"		
5766E		2¼"	1"	2¼"	2"	13/32"	A3184-8R
5766F			1¼"		1⅝"		
5768G		3¼"	1½"	3¼"	1¾"	111/16"	A3194-8R
A5764D	Steel	1¾"	¾"	1¾"	23/16"	7/8"	A2697-20R
A5764E			1"				
A5768H		3¼"	2"	3¼"	113/16"	115/16"	A3194-8R



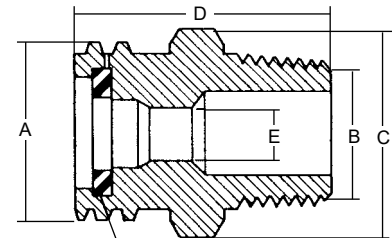
Gasket (Furnished with adapter)

ACME x Female NPT



Ordering Information

Part Number	Material	A M. ACME	B M. NPT	C Hex	D Overall Length	E Diameter	For Spare Gasket Order Part No.
5763D	Brass	1¼"	¾"	1¼"	1¾"	½"	A2797-20R
5765D		1¾"	¾"	1¾"	1 ²³ / ₃₂ "	2 ⁹ / ₃₂ "	A2697-20R
5765E			1"		2 ³ / ₃₂ "		
5765F			1¼"				
5767F		2¼"	1¼"	2¼"	2⅜"	1 ³ / ₁₆ "	A3184-8R
5767G			1½"		1⅜"		
5767H			2"	2⅜"	2 ⁷ / ₁₆ "	1 ²⁵ / ₆₄ "	
5769K		3¼"	3"	3½"	3⅝"	2⅛"	A3194-8R
A5765C	Steel	1¾"	½"	1¾"	2 ³ / ₁₆ "	1 ⁷ / ₃₂ "	A2697-20R
A5765D			¾"			1 ¹ / ₁₆ "	
A5765E			1"			5 ⁷ / ₆₄ "	
A5765F			1¼"				
A5767F		2¼"	1¼"	2¼"	2⅜"	1¼"	A3184-8R
A5769H		3¼"	2"	3¼"	2⅞"	1 ¹⁵ / ₁₆ "	A3194-8R
A5769K			3"	4"	3 ¹³ / ₁₆ "		

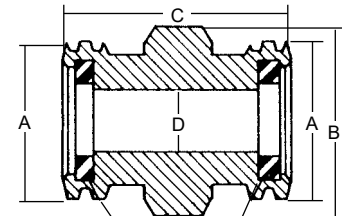


Gasket (Furnished with adapter)

ACME x Male NPT

Ordering Information

Part Number	Material	A M. ACME	B Hex	C Overall Length	D Diameter	For Spare Gasket Order Part No.
5765M	Brass	1 3/4"	1 1/4"	2"	29/32"	A2697-20R
5767M		2 1/4"	2 1/4"	2 7/16"	1"	A3184-8R
5769M		3 1/4"	3 1/4"	2 3/4"	1 25/16"	A3194-8R



Gasket (Furnished with adapter)

ACME x ACME

Ordering Information

Part Number	Material	A M. ACME	B F. NPT	C Overall Length	D Diameter	For Spare Gasket Order Part No.
A5764W	Steel	1 3/4"	3/8"	1 1/4"	1 1/4"	2697-20
5764W	Brass					

* 3/8" -16 UNC Thread.



ACME x Miscellaneous
(Recommended for securing hose-end valve when not in use).

Low Emission ACME Connector For Transports and Bobtails 6588LE & 6589LE

Designed to provide fast filling of bobtails, transports and large bulk storage tanks while providing for low emission of LPG when disconnecting.



6588 Series

Ordering Information

Part Number	ACME Connection	Outlet Connection M.NPT	Wrench Flats	Hydrostatic Relief Valve	Propane Capacity at Various Differential Pressures (GPM, LPM)					
					5 psig (0.35 barg) GPM	5 psig (0.35 barg) LPM	10 psig (0.69 barg) GPM	10 psig (0.69 barg) LPM	25 psig (1.72 barg) GPM	25 psig (1.72 barg) LPM
6588LE	3 1/4"	2"	3 1/2"	3125L	138	522.4	223	844.1	349	1321
6589LE	3 1/4"	3"		3125L						

Copper Pigtails

Straight Pigtails

Ordering Information

Connections	Approximate Length	Part Number		
		1/4" Tube		3/8" Tube
		3/8" Hex Short Nipple	1 1/4" Hex Long Nipple	3/8" Hex Short Nipple
M.POL x M.POL	5"	-	-	913PS05
	12"	912PS12	-	913PS12
	20"	912PS20	912PA20	913PS20
	30"	912PS30	-	913PS30
	36"	912PS36	912PA36	913PS36
	48"	912PS48	912PA48	913PS48
1/4" Inverted Flare x M.POL	12"	912FS12	-	-
	20"	912FS20	912FA20	-
	30"	912FS30	-	-
	36"	912FS36	-	-
1/4" M.NPT x M.POL	5"	-	-	913JS05
	12"	912JS12	-	913JS12
	20"	912JS20	912JA20	913JS20
	36"	912JS36	-	-
1/2" M.NPT x M.POL	12"	-	-	913LS12
1/2" M.NPT x 3/8" M.NPT	12"	-	-	913KL12



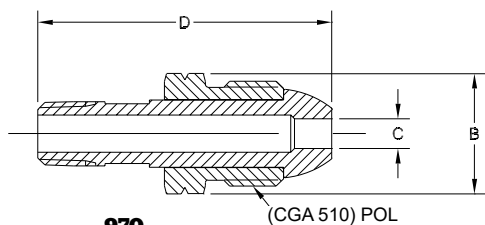
912JS12

Bent Pigtails

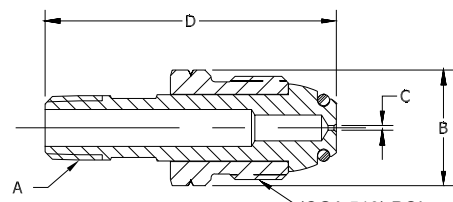
Ordering Information

Connections	Approximate Length	Part Number	Type/Degree of Bend
		⅜" Tube	
		⅝" Hex Short Nipple	
¼" M. NPT x M. POL	5"	913JS05A	90°
M. POL x M. POL		913PS05A	
	12"	913PS12G	270° Right Hand
		913PS12H	270° Left Hand
		913PS12S	360°

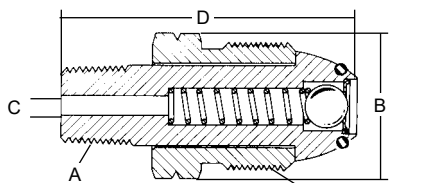
Male POL Swivel Adapters



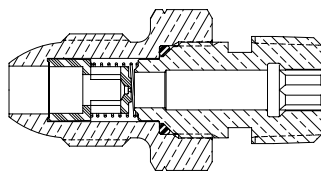
970
Hard Nose POL



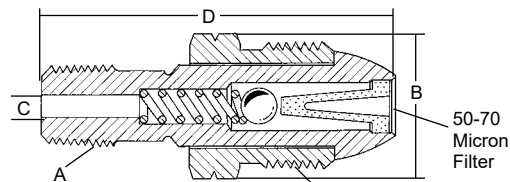
970S
Soft Nose POL w/60 DMS Orifice



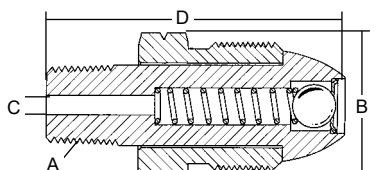
970AXS
Soft Nose POL w/Excess Flow



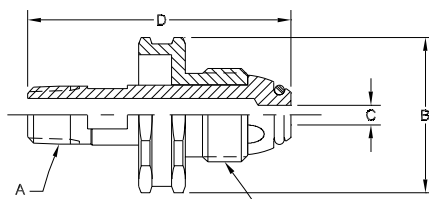
3188 Series



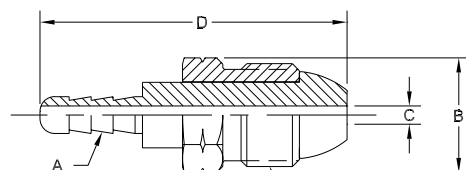
3199W
Heavy Duty Hard Nose POL w/Excess Flow



970AX
Hard Nose POL w/Excess Flow



970AW
970HT
Soft Nose POL w/Handwheel



970JR
Hard Nose POL w/Hose Barb Connection

Ordering Information

Part Number	Material	A Outlet Thread	B Hex	C Drill	D Overall Length	Vapor at 100 PSIG Inlet (SCFH)	Liquid (GPM)
970	Brass	1/4" M. NPT	3/8"	1/4"	2 15/32"	-	-
970S				.040" orifice			
970AS				0.188" orifice			
970AX			1 3/8"	1/8"	2 15/32"	404	1.10
970AXS				5/32"			
970WXS				3/16"			
3199W		1/4" Hose Barb	3/8"	5/32"	2 7/16"	450	0.95
970AW				3/16"	2 15/32"	-	-
970HT				.040" orifice			
970JR				5/32"	2 5/8"	350	.95
3188A		1/2" M. NPT	1 1/8"	5/32"	2 1/2"	700	1.9
3188B						1180	2.9
3188C							

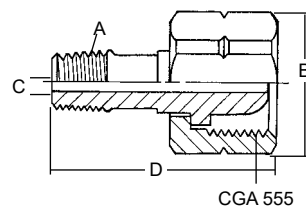
Note: All nipples incorporate wrench hex section.

H

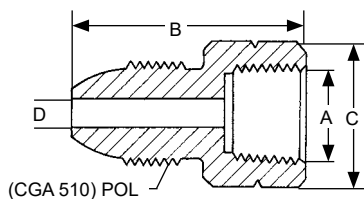
CGA 555 Swivel Adapters

Ordering Information

Part Number	Material	A Outlet Thread	B Hex	C Drill	D Overall Length
12982	Brass	1/4" M. NPT	1 1/8"	3/16"	1 7/8"



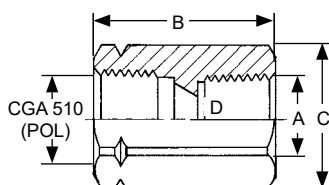
POL Adapters



Male POL x Female NPT

Ordering Information

Part Number	Material	A M. ACME	B	C Hex	D Diameter
2906A	Brass	1/4"	1 1/2"	7/8"	9/32"
2906G		1/2"	2"	1 1/8"	

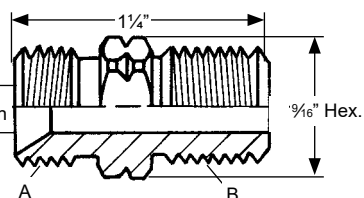


Female POL x Female NPT and Female POL

Ordering Information

Part Number	Material	A	B	C Hex	D Diameter
5760A	Brass	1/4" F.NPT	1 5/8"	1 1/8"	1 3/32"
5760B		3/8" F.NPT			1 3/32"
5760C		1/2" F.NPT			7/16"
5760D		3/4" F.NPT	1 7/8"	1 3/8"	1 3/32"
5760S		POL (CGA 510)	2 1/8"	1 1/8"	1 3/32"

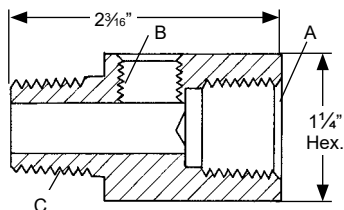
Hose Adapter
For use with fuel gases (LP-Gas, Acetylene).



Ordering Information

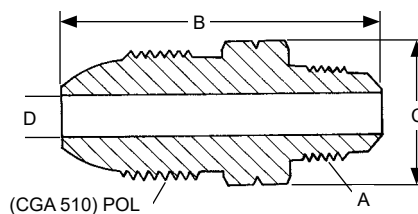
Part Number	Material	A	B
1300	Brass	7/16-18UNF (L.H.)	1/4" M. NPT

Pressure Gauge Adapter



Ordering Information

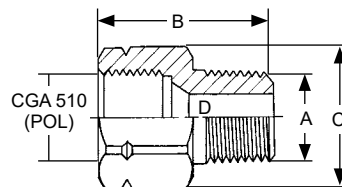
Part Number	Material	A	B	C
1494-1	Brass	1/2" F. NPT	1/4" F. NPT	1/2" M. NPT



Male POL x Male NPT and SAE Flare

Ordering Information

Part Number	Material	A	B	C Hex	D Diameter
2906D	Brass	3/8" M. NPT	2 5/64"	7/8"	1 1/32"
2906F		3/8" SAE Flare	2 3/32"		9/32"
2906E		1/2" SAE Flare	2 9/32"		



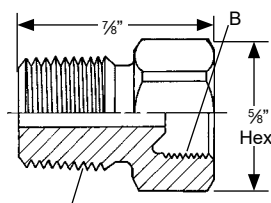
Female POL x Male NPT

Ordering Information

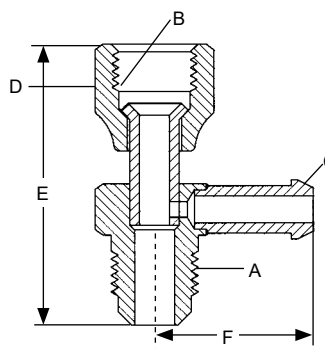
Part Number	Material	A	B	C Hex	D Diameter
5761A	Brass	1/4" M.NPT	1 5/8"	1 1/8"	3/16"
5761B		3/8" M.NPT			13/32"
5761C		1/2" M.NPT			7/16"
5761D		3/4" M.NPT			7/16"

Ordering Information

Part Number	Material	A	B
15774-1	Brass	1/4" M. NPT	1/4" Female Inverted Flare



Female Inverted Flare x Male NPT



Ordering Information

Part Number	Material	A	B	C	D	E	F
1328	Brass	3/8" SAE Male Flare	3/8" SAE Female Flare	3/8"	1 3/16"	2"	1 1/8"
1331		1/2" SAE Male Flare	1/2" SAE Female Flare		1"	2 1/8"	1 1/4"
1332		5/8" SAE Male Flare	5/8" SAE Female Flare		1 1/8"	2 1/2"	

1" Rotogages® for Large Mobile and Stationary Containers

A9090 Series

Rotogages® are designed to provide an accurate determination of LP-Gas or anhydrous ammonia container contents. They mount in a standard 1" NPT coupling on large mobile or stationary containers.

To operate the Rotogages®, the vent valve is opened and the dip tube rotated slowly from the container vapor space to the liquid space. The difference in appearance of the discharge indicates when the liquid level is reached. Dial readings then indicate the percentage of product in the container.

Tubes for use with A9090 Series Rotogages
Cut to length required.

Service	Part Number
Up to 48"	A9091-M24.0
Up to 72"	A9091-M36.0
Up to 96"	A9091-M48.0
Up to 120"	A9091-M60.0
Up to 144"	A9091-M72.0

Rotogage® Dials

Ordering Information

Part Number	Service	Container Size
A9091-18L	LP-Gas	All Sizes
A9091-18LX*	LP-Gas	Over 1200 U.S. gallons
A9091-18N	NH ₃	All Sizes

* Dial permits higher filling level, per NFPA 58,



A9091-18LX



Rotogage® Assembly

1" Rotogages® for Large Mobile and Stationary Containers

For Small Mobile or Stationary Containers
A9091R and A9092R Series



Ordering Information

Part Number		For Container Inside Diameter			
					
		Ellipsoidal Heads		Hemispherical Heads	
For Mobile or Stationary Containers	For Stationary Containers Only	Side Mounted	End Mounted	Side Mounted	End Mounted
A9091R	-	30" - 45"	30" - 75"	30" - 45"	30" - 45"
A9092R	-	46" - 61"	76" - 108"	46" - 61"	46" - 61"
A9093TS*	A9093RS	62" - 79"	109" - 147"	62" - 79"	62" - 79"
A9094TS*	A9094RS	80" - 99"	-	80" - 99"	80" - 99"
A9095TS*	A9095RS	100" - 147"	-	100" - 147"	100" - 147"

* Supported Design

NOTE: The dip tube must be cut to the required length($\frac{1}{2}$ " of container inside diameter minus $5\frac{3}{4}$ ").

3/4" Rotogages® for Small Stationary and Mobile LP-Gas Containers 2070 Series

Rotogages® are designed to provide accurate determination of LP-Gas container contents. They may be end or side mounted in a standard 3/4" NPT coupling on stationary or mobile containers. To guarantee accurate measurement, they should not be used on stationary containers that exceed 60" I.D. or on mobile containers, subject to vibration, with an I.D. of more than 24".



2070 Series

Ordering Information

Part Number		For Containers with Inside Diameter	Tank Connection	Valve Seat Orifice
Rotogage®	Dip Tube			
2070C0	2071-L25.7	Up to 40"	3/4 M. NPT	No. 54 Drill Size
	2071-L39.7	Up to 60"		

NOTE: The dip tube must be cut to the required length (1/2 of container inside diameter minus 1/2"), when mounted on center line of tank.

Pull-Away Valves for Transfer Operations A2141 Series

Designed especially to provide pull-away protection for LP-Gas and anhydrous ammonia transfer operations including transport and delivery truck loading and unloading, engine fuel container filling and miscellaneous cylinder filling operations. When properly fastened to the inlet end of the discharge hose, the valve is designed to stop gas escape from both upstream and downstream lines in the event of a pull-away. An excessive tension pull causes the valve to automatically separate, closing two internal back pressure checks. Only a few cubic centimeters of gas escape at the instant of separation.

It is recommended that a convenient means be provided to safely remove the pressure from the line upstream of each coupling half to enable reassembly of the valve. To reassemble, simply push the male half firmly into the female half until the retaining balls slip into the retaining groove. Check for leaks after reassembly.

NOTE: It is recommended that pull-away valves be maintained and safety tested periodically to confirm that they will separate properly in the event of a pull-away. Lubrication every six months is essential to the pull-away's operation. Dry nitrogen or other inert gas is suggested as a source of pressure for pull-away tests.

If the A2141 pull-away valve is going to be stored for a period of time, A2141 Series such as in seasonal applications, it is recommended that it be sprayed with a good grade of rust-preventive machine oil, and covered to protect it from moisture.



A2141A6



A2141A10

Ordering Information

Part Number	Inlet/Outlet Connections NPT F.	Disconnect Force Approx-lbs	Reconnect Force Approx-lbs	Length Of Valve	LP-Gas Liquid Flow Capacity at Various Differential Pressures (GPM, LPM)*			
					5 psig (0.35 barg)	10 psig (0.69 barg)	25 psig (1.72 barg)	50 psig (3.45 barg)
A2141A6	3/4"	130	80	3 7/8"	11 GPM (41.64 LPM)	16 GPM (60.57 LPM)	25 GPM (94.64 LPM)	36 GPM (136.3 LPM)
A2141A6L**								
A2141A8	1"	75	50	4 9/16"	21 GPM (79.49 LPM)	30 GPM (113.6 LPM)	47 GPM (177.9 LPM)	67 GPM (254.6 LPM)
A2141A8L**								
A2141A10	1 1/4"	160	25	5 5/8"	52 GPM (196.8 LPM)	75 GPM (283.9 LPM)	120 GPM (454.2 LPM)	170 GPM (643.5 LPM)
A2141A16	2"	300	50	14 5/16"	250 GPM (946.4 LPM)	350 GPM (1325 LPM)	550 GPM (2082 LPM)	750 GPM (2839 LPM)

* To Determine NH₃ liquid flow capacity, multiply by .90.

LP-Gas Emergency Shut-Off Valves (ESV's)

Why and how they should be used for Bobtail Filling and Transport Unloading.

General Information

The primary purpose of Emergency Shut-Off Valves in bobtail filling and transport unloading is to allow quick shut-off of liquid and vapor flow in the event there is an accidental pull-away of a truck or a hose rupture, both of which could cause a fire.

A system using Emergency Shut-Off Valves will not prevent some spillage of liquid and vapor, but the total system should be constructed so this spillage will be kept to a minimum.

This can be accomplished either by making possible, quick action by the driver or plant personnel in closing the valves by manual remote or pneumatic remote actuation; or in case of a pull-away, by automatic closing of the liquid valve by means of a cable connected to the liquid hose.

By minimizing the presence of liquid and vapor, the chance of a fire or explosion will be reduced. In case of a fire, thermal links at the valves or at other appropriate locations could close the valves and prevent further release of liquid and vapor.

The valve closing systems will be discussed later in this section. The user should decide which system is most appropriate, depending on the piping configuration and the general layout of the filling/unloading area.

ESV Application for Bobtail Loading and Transport Unloading

A very important function of the typical LP-Gas storage plant is to transfer LP-Gas into bobtails for delivery to customers. How efficiently and rapidly these bobtails can be filled often determines the number of customers that can be served each day, as well as how many bobtails are required to satisfactorily serve all customers. Therefore, the selection of an ESV for the bobtail liquid loading line should be done with care so as to maximize efficiency in filling and have year-round dependability.

The RegO 2" (A6016) and 3" (A6024) liquid ESVs have a full open port so that the restrictions of flow would be no more than you would expect through an equivalent length of schedule 80 pipe. To improve the overall efficiency of the system, the valves were designed as an operating valve so it could replace an existing globe or angle valve already installed at the end of the fixed piping. Thus, installing a RegO ESV could actually result in a more efficient pumping operation than the existing system.

Equally important in the consideration of an ESV is its performance in an emergency, especially bobtail pull-aways. Therefore, when selecting the proper ESV for bobtail filling, also consider the dependability of performance, and simplicity of operation and maintenance.

The RegO ESVs clearly indicate to the operator its open or closed position. It allows full manual control by the operator and provides means for remote operation in emergencies from either in front of the valve or in the rear.

No complicated systems of pulleys and cables are necessary since direct, straight pulls will close the valve. Means are even provided to secure a length of cable to the transfer hose so as to produce an automatic closing in the event the driver pulls away without disconnecting the hose.

NFPA Provisions (2014)

The pertinent provisions of NFPA Pamphlet 58, as they apply to Emergency Shut-Off Valves and how they are to be installed are below (for complete information refer to NFPA 58):.

Section 5.12.2.3 requires that emergency shutoff valves be approved and incorporate all the following means of closing: (1) Automatic shutoff through thermal (fire) actuation, (2) Manual shutoff from a remote location, (3) Manual shutoff at the installed location.

Section 5.12.2.4 states where fusible elements are used; the melting point cannot exceed 250°F (121°C).

This provision sets for the basic criteria for the emergency shutoff valve, a key valve in the protection of many liquid transfer operations. Actuating means for remote control may be electrical, mechanical or pneumatic.

Many systems use a pneumatic system where the tubing itself acts as a fusible element releasing the pressure holding the valve open. With respect to the feature of manual shutoff at the installed location, it is recommended that this valve be operated occasionally. Also, the system should be tested periodically to determine that it will function properly.

Section 6.12.1 covers new and existing installations, stationary container storage systems with an aggregate water capacity of more than 4000 gal (15.1m³) utilizing a liquid transfer line that is 1½ in. (39 mm) or larger and pressure equalizing lines 1¼ in (32 mm) or larger, must be equipped with emergency shutoff valves.

Section 6.12.2 describes where an emergency shutoff valve must be installed in the transfer lines of the fixed piping transfer system within 20 ft (6m) of lineal pipe from the nearest end of the hose or swivel-type piping connections.

Section 6.12.5 covers installations where there are two or more liquid or vapor lines with hoses or swivel-type piping connected of the sizes designated in 6.12.1, an emergency shutoff valve or a backflow check valve, where allowed, must be installed in each leg of the piping.

Section 6.12.6 states the requirements for thermal protection; emergency shutoff valves must be installed so that the temperature-sensitive element in the valve, or a supplemental temperature-sensitive element that operates at a maximum temperature or 250°F (121°C) that is connected to actuate the valve. It also states maximum distance this can be which is not more than 5ft (1.5m) from the nearest end of the hose or swivel-type piping connected to the line in which the valve is installed.

Section 6.12.7 requires that the temperature-sensitive elements of emergency shutoff valves cannot be painted, or can they have any ornamental finishes applied after manufacture.

Section 6.12.8 emergency shutoff valves or backflow check valves must be installed in the fixed piping in manner to protect them so that any breaks resulting from a pull will occur on the hose or swivel-type piping side of the connection; allowing the valves and piping on the plant side of the connection to remain intact.

Section 6.12.9 emergency shutoff valves that are required to be installed in accordance with 6.12.2, that a means must be incorporated to actuate the emergency shutoff valves in the event of a break of the fixed piping resulting from pulling of the hose.

Section 6.12.10 states that all emergency shutoff valves required by the code be annually tested for the functions required in 5.12.2.3 (2) Manual shutoff from a remote location, (3) Manual shutoff at the installed location; the results of the test are documented.

Section 6.12.12 requires that new and existing emergency shutoff valves shall comply with 6.12.12.1 through 6.12.12.3 below.

Section 6.12.12.1 requires that the emergency shutoff valve shall have at least one clearly identified and accessible manually operated remote shutoff device.

Section 6.12.12.2 states that the remote shutoff device for an emergency shutoff valve must be located not less than 25ft (7.6m) or more than 100 ft. (30 m) in the path away from the emergency shutoff valve.

Section 6.12.12.3 describes the requirements when an emergency shutoff valve is used in place of an internal valve in compliance with 5.7.4.2(D) (2) the remote shutoff device have to be installed in accordance with 6.11.4 and 6.11.5.

The provisions above and others covered in NFPA 58 can assist in determining how bobtail filling and transport unloading stations are to be configured. The diagrams shown here offer general information, they should not be used as an installation guide.

LP-Gas Emergency Shut-Off Valves (ESV's)

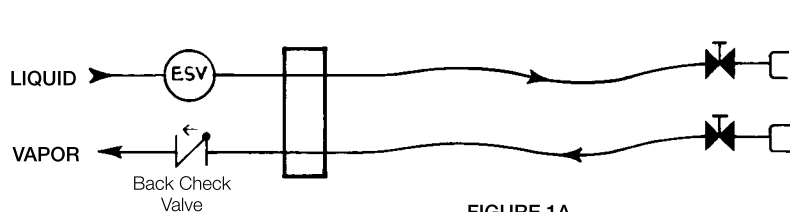


FIGURE 1A
Bobtail Filling Only

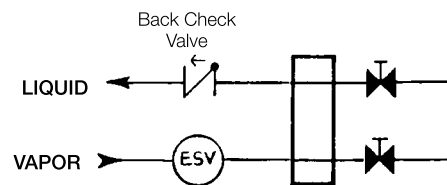


FIGURE 1B
Transport Unloading Only

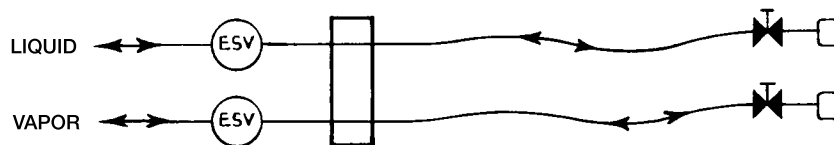


FIGURE 1C
Combined Bobtail Filling
and Transport Unloading

Installation Compliance with NFPA Requirements

A valve that is approved as an ESV may be installed in the fixed piping up to a distance of 20 feet (along the pipe) from the point where the transfer hose is attached to the fixed piping.

However, when the ESV is located more than five feet from the end of the fixed piping, an additional fusible element must be installed within five feet of the point of attachment of the hose, and be connected to the ESV valve in such a manner that it will cause the ESV to close in the event of a fire.

The ideal location of the ESV is as close to the end of the fixed piping as possible. This position eliminates the need for an additional fusible element and cable, and it may also permit the elimination of a restrictive valve already installed at the end of the fixed piping.

To this point, our comments have been principally concerned with ESV protection of the liquid line at bulk plants because this is the area of greatest potential danger in the event of a pull-away or hose rupture.

However, regulations also require an ESV in the vapor transfer line when the vapor hose is 1¼" or larger. A helpful rule of thumb in determining whether or not an ESV control valve is required in your

vapor system is this: If the vapor flow is out of the storage tank, an ESV is required. ESV systems are designed to protect the storage tank contents against uncontrolled release.

Therefore, a bobtail loading system could use a 1¼" or larger back pressure check valve in the vapor system since the flow of vapor is always from the bobtail being filled back to the storage tank. To improve transfer rates, the use of the RegO 6586D back check valve at this location would provide protection at minimum pressure drop.

If the bobtail vapor line is also used when unloading transports, then the RegO A6010 ESV should be used. The A6010 provides thermal protection, manual closing and a remote emergency closing system similar to the RegO 2" liquid ESV, A6016.

Remote Control Systems

Usually in transfer loading operations, the valve handles and cables are located in close proximity to the area of greatest potential danger during an emergency. Therefore, each bobtail filling system or transport unloading system should have installed in it at least one readily accessible, alternate remote operating device.

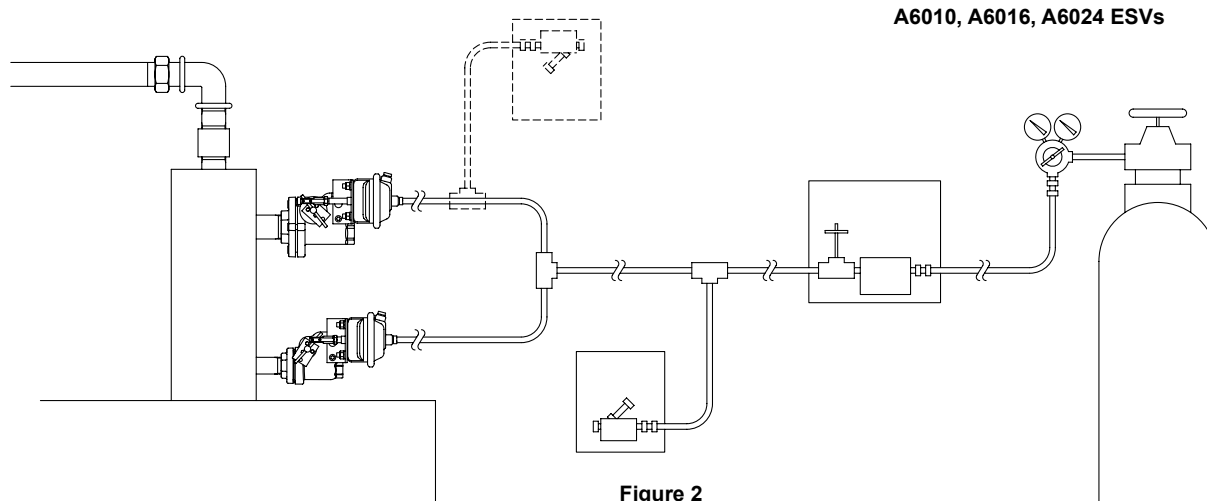


Figure 2
RegO ESV's with Remote Pneumatic
and Transfer Hose Cable Release
Systems Typical Installation

1¼", 2" & 3" Swing-Check ESV for Bulk Plants A6010, A6016 and A6024 Series

Designed for installation in liquid or vapor transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.



A6010



A6016



A6024



6016-60C



6016RA



6016-60D

Ordering Information

Part Number	Seat	Inlet and Outlet Connections	Liquid Flow Capacity at 10 psig (0.69 barg) Drop (GPM)	Liquid Flow Capacity at 10 psig (0.69 barg) Drop (GPM)	Accessories		
					Remote Close Pneumatic	Remote Open/Close Pneumatic	Remote Open/Close Rotary
VA6010	Viton	1¼" F. NPT	259 (LP-Gas)	980.4 (LP-Gas)	6016--60D	6016-60C	6016RA
A6010	Buna-N		233 (NH ₃)	844.1 (NH ₃)			
VA6016	Viton	2" F.NPT	711 (LP-Gas)	2691 (LP-Gas)			
A6016	Buna-N		640 (NH ₃)	2423 (NH ₃)			
VA6024	Viton	3" F.NPT	1325 (LP-Gas)	5016 (LP-Gas)			
A6024	Buna-N		1173 (NH ₃)	4440 (NH ₃)			

Flanged Swing-Check ESVs for Bulk Plants FA6010, FA6016 and FA6024

Designed for installation in liquid transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.



FA6010



FA6016



FA6024

Ordering Information

Part Number	Seat	Inlet and Outlet Connections	Liquid Flow Capacity at 10 psig (0.69 barg) Drop (GPM)	Liquid Flow Capacity at 10 psig (0.69 barg) Drop (LPM)	Accessories		
					Remote Close Pneumatic	Remote Open/Close Pneumatic	Remote Open/Close Rotary
FVA6010	Viton	1¼" - 300# ANSI RF Flange	233 (NH3)	882 (NH3)	FA6016-60D	*	6016RA
FA6010	Buna-N	1¼" - 300# ANSI RF Flange	259 (LP-Gas)	980.4 (LP-Gas)			
FVA6016	Viton	2" - 300# ANSI RF Flange	640 (NH3)	2422.7 (NH3)			
FA6016	Buna-N	2" - 300# ANSI RF Flange	711 (LP-Gas)	2691.4 (LP-Gas)			
FVA6024	Viton	3" - 300# ANSI RF Flange	1173 (NH3)	4440.3 (NH3)		6016-60C	
FA6024	Buna-N	3" - 300# ANSI RF Flange	1325 (LP-Gas)	5015.7 (LP-Gas)			

* Not Available

Swing-Check ESVs for Bulk Plants with Electric Actuator EA6010, EA6016 and EA6024

Designed for installation in liquid transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.



EA6010



EA6016



EA6024

Ordering Information

Part Number	Seat*	Inlet and Outlet Connections	Voltages	Liquid Flow Capacity at 10 psig (0.69 barg) Drop (GPM, LPM)	
				LP-Gas	NH ₃
EA6010	Buna-N	1¼" F.NPT	12/24 VDC	259 GPM 980.4 LPM	233 GPM 882 LPM
EA6016		2" F.NPT		711 GPM 2691.4 LPM	640 GPM 2422.7 LPM
EA6024		3" F.NPT		1325 GPM 5015.7 LPM	1173 GPM 4440.3 LPM

* Viton seat available on request.

Flanged ESVs for Bulk Plants with Electric Actuator EFA6010, EFA6016 and EFA6024

Designed for installation in liquid transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.



EFA6010



EFA6016



EFA6024

Ordering Information

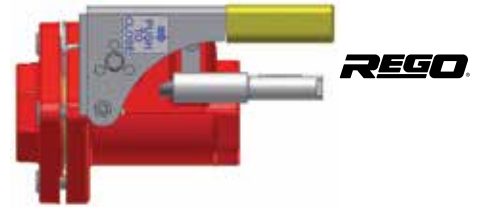
Part Number	Seat*	Inlet and Outlet Connections	Voltages	Liquid Flow Capacity at 10 psig (0.69 barg) Drop (GPM, LPM)	
				LP-Gas	NH ₃
EFA6010	Buna-N	1¼" - 300# ANSI RF Flange	12/24 VDC	259 GPM 980.4 LPM	233 GPM 882 LPM
EFA6016		2" - 300# ANSI RF Flange		711 GPM 2691.4 LPM	640 GPM 2422.7 LPM
EFA6024		3" - 300# ANSI RF Flange		1325 GPM 5015.7 LPM	1173 GPM 4440.3 LPM

* Viton seat available on request.

ESV Pneumatic Controls

RegO Emergency Shut-Off Valves modified for remote pneumatic shutdown operation retain all the operating features of the standard valves.

Once equipped with pneumatic cylinders and then pressurized, the pneumatic cylinder piston rod disengages from a striker plate, allowing the ESV to be manually opened and the striker plate to act as a latch and hold the valve open. Release of the control system pressure for any reason closes the ESV for fail-safe operation.



A6016 with 6016-60D Remote Close Actuator

6016PN-50 Pneumatic Remote Control Kit

Control kit with components for connecting and charging the pneumatic controls from a source of compressed gas (air or nitrogen) to a RegO liquid or vapor ESV. Includes charging valves with low pressure indicator, operating valves, 100 feet of 1/4" plastic tubing and tube fittings.

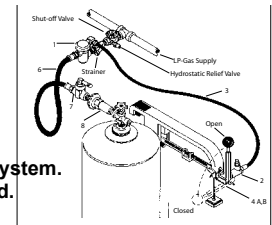


Ordering Information

Part Number	Description
6016-60D	Cylinder assembly kit to convert 6016 ESVs to pneumatic shutdown.
6016PN-50	Pneumatic remote shutdown system kit, complete with 100' of tubing, fittings, 1 charging valve assembly and 1 remote shutdown valve assembly
6016PN-80	Bypass kit for pneumatic actuators.
7605A-BT	100' roll of 1/4" pneumatic tubing.
7605AP-16	1/4" tubing tee, with nuts.
7605AP-15	1/8" NPT x 1/4" tubing, straight connector.
6016RM	Remote Close Cable Kit

Hydraulic Automatic Cylinder Filling System 7194MD and 7194HD

Designed to provide accurate, economical filling of LP-Gas, DOT and fork lift cylinders by weight. Filling stops automatically as the total weight of the cylinder reaches the amount pre-set on the scale. One individual can efficiently handle up to four cylinder filling operations simultaneously to maximize profits, increase efficiency and allow servicing of more customers.



Hydraulic self-contained system.
No external power required.

Ordering Information

Hydraulic System Components

Key No.	Description	Size	Part No.
Assembly for Fairbanks-Morse. Includes items 1 thru 8 below.			7194MD
Assembly for Howe. Includes items 1 thru 8			7194HD
1	Propane Control Valve	1/2" NPT Female, with 1/8" NPT Female Hydraulic Connection	7177
2	Master Cylinder, with Actuator Lever	1/8" NPT Hydraulic Connection	7188
3	Hydraulic Hose Assembly	3/16" I.D. with 1/8" NPT Male Ends, 43 1/2" Overall Length	7194-1
1-3	Valve, Cylinder and Hose Assembly for Fairbanks-Morse Scales	-	7188MS
1-3	Valve, Cylinder and Hose Assembly for Howe Scales	-	7188HS
4A	Bracket Kit for Fairbanks Morse Scales, Complete with Screws, Washers, Nuts and Instructions	-	7194M-3A
4B	Bracket Kit for Howe Scales, Complete with Screws, Washers, Nuts and Instructions	-	7194H-3
5	Can of Hydraulic Fluid, Complete with Filling Spout	1 1/2 ounce	7188-21
6	Propane Filling Hose Assembly	1/2" I.D., with 1/2" NPT Male Ends, 50 1/2" Overall Length	7193D
7	Quick-acting Shut Off Valve	1/2" NPT Inlet X 1/4" NPT Outlet	7901TB
8*	Soft Nose Cylinder Connector	1/4" NPT Male X POL Male	7193D-10L

3" Heavy Duty Swing Check with Flow Indicator A7624

This back check valve is designed to provide required back flow protection for the unloading riser in the bulk plant's transfer area. It is designed specifically for pipeline installation and is suitable for LP-Gas and anhydrous ammonia service. Product flow moves the swing check to the open position, when flow stops the spring loaded swing check closes.



A7624

Ordering Information

Part Number	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 psig (0.69 barg) Drop GPM	Liquid Capacity at 10 psig (0.69 barg) Drop LPM
A7624	LPG & NH3	3" F.NPT	1325-GPM(LPG) 1173-GPM(NH3)	5016-LPM(LPG) 4440-GPM(NH3)

2" Heavy Duty Swing Check with Flow Indicator A7616

This back check valve is designed to provide required back flow protection for the unloading riser in the bulk plant's transfer area. It is designed specifically for pipeline installation and is suitable for LP-Gas and anhydrous ammonia service. Product flow moves the swing check to the open position, when flow stops the spring loaded swing check closes.



A7616

Ordering Information

Part Number	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 psig (0.69 barg) Drop GPM	Liquid Capacity at 10 psig (0.69 barg) Drop LPM
A7616	LPG & NH3	2" F.NPT	711-GPM(LPG) 640-GPM(NH3)	2691-LPM(LPG) 2423-LPM(NH3)

Sight Flow Indicators for Bulk Plants A7794 and A7796

Designed to promote maximum pump efficiency, these indicators enable bulk plant operators to visually inspect liquid flow conditions. With glass on both sides of the indicator, flow can be observed from either side, even under some poor light conditions. The integral swing check also serves as a back-check valve to prevent reverse flow and product loss if the hose fails in a loading operation.

By installing an indicator on the upstream side of the plant pump, suction conditions can be observed and the pump speed adjusted to obtain the maximum possible flow rate without cavitation. Additionally, if an indicator is installed in the piping at the loading rack, just ahead of the loading hose, the operator can maintain a constant check on pump conditions.

Both installations are designed to allow for observation to provide maximum pump efficiency and ensure safe plant pump operation.

In compressor operations a sight flow indicator installed in the liquid line will give a visual indication when the tank car or transport is emptied. Compressor operation can then be immediately reversed to start recovery of the vapor.



A7794

Ordering Information

Part Number	A Inlet/Outlet Connections	B Length
A7794	2" F. NPT	5 3/4"
A7796	3" F. NPT	7 3/4"

Hose End Adapters for DOT Cylinder Filling 7193D-10 and 7193U-10

Designed to provide quick and easy filling of DOT cylinders with POL or Type I connections. This adapter may be used with hydraulic and electric automatic systems or with manual systems in conjunction with a RegO 7901TB Quick Acting Shut-Off Valve.

These filling connectors have an extended connection on the handwheel, which makes it possible to connect the loading hose to valves on cylinders with fixed collars. The handwheel is well outside the collar for easy operation.



7193D-10

7193U-10

Ordering Information

Part Number	Applications	Inlet Connection	Outlet Connection	Materials
7193D-10	Filling of DOT Cylinders with POL Connections	1/4" M. NPT	M. POL (CGA 510)	Brass & Stainless Steel
7193U-10	Filling of DOT Cylinders with Type I Connections		Type 1 Connection (1 ⁵ / ₁₆ " F. ACME)	Brass

Connector for DOT Cylinder Filling Adapter 7193T-10

The 7193T-10 Connector is designed for use on the 7193D-10 Filling Adapters. Connector allows quick connection to the Type I 1⁵/₁₆" M. ACME threads for operators that fill both POL and Type I valves.



7193T-10

Ordering Information

Part Number	Applications	Inlet Connection	Outlet Connection	Materials
7193T-10	Converts 7193D-10 Adapters from POL to a Type 1 Connection	F. POL CGA 510	Type 1 Connection (1 ⁵ / ₁₆ " F. ACME)	Brass

New Patented Low Emission Hose End Safety Adapter 7193D-10L

Low Emission Adapter (1.18 cc at disconnect) designed to provide quick and easy filling of DOT cylinders with POL connections with minimal release of product on disconnect. This adapter may be used with dispensing systems in conjunction with RegO 7901T Series Quick Acting Shut-Off Valve. Balanced, light weight design for filling into 20 # - 200 # cylinders.



7193D-10L Series

Ordering Information

Part Number	Application	Inlet Connection	Outlet Connection	Materials
7193D-10L	Filling of DOT cylinders with POL Connections	1/4" M. NPT	M. POL (CGA 510)	Brass & Stainless Steel

New Patented Low Emission Hose End Safety Adapter 7193U-10L

Low Emission Adapter (1.18 cc at disconnect) designed to provide quick and easy filling of DOT cylinders with Type 1 connections with minimal release of product on disconnect. This adapter may be used for dispensing systems in conjunction with RegO 7901T Series Quick Acting Shut-Off Valve. Balanced, light weight design for filling into 20 # - 200 # Cylinders



7193U-10L Series

Ordering Information

Part Number	Application	Inlet Connection	Outlet Connection	Materials
7193U-10L	Filling of DOT cylinders with Type 1 Connections	1/4" M. NPT	Type 1 Connection (1 ⁵ / ₁₆ " F. ACME)	Brass

Hose End Adapter for Lift Truck Cylinder Filling 7193L-10A

The 7193L-10A is designed to provide quick and easy attachment of the filling hose to DOT cylinders equipped with RegO 7141M check connectors.



The 1½" ACME outlet threads facilitate rapid make-up. When connected, back-checks in the adapter and check connector automatically open. Low pressure drop between the two ensures high filling rates. An integral check closes when disconnected, eliminating the need to close any valves manually to disconnect the charging hose.



7193L-10A

Because a leak-tight seal is formed before the integral check opens or closes, product loss is kept to an absolute minimum when connecting or disconnecting the loading hose.

Ordering Information

Part Number	Application	Inlet Connection	Outlet Connection	Body Material	Accessories
					Adapter
7193L-10A	Filling of Fork Lift Cylinders*	¼" M. NPT	1½" F. ACME	Brass	5760A

*The 7193L-10A is intended to be permanently attached to the filling hose.

A 5760A adapter enables the 7193L-10A to be attached to the POL connection on the 7193D-10 at regular cylinder filling stations to allow for occasional filling of fork lift cylinders.

Lever Operated Hose End Adapter for Fork Lift Cylinder Filling 7193K-10B

Designed to drastically reduce labor and time when continuously filling large numbers of lift truck cylinders equipped with RegO 7141M check connectors.



Rapid make-up is accomplished by simply slipping the adapter yoke behind the hex wrenching section of the 7141M connector and depressing the lever. When the cylinder is filled, the adapter is easily disengaged by releasing the operating lever. When connected, back checks in the adapter and connector automatically open. An integral check closes when disconnected, eliminating the need to close any valves manually on the filling manifold to disconnect the charging hose. The shut-off valve on the container must be closed after filling.



7193K-10B

Because a leak-tight seal is formed before the checks close, product loss is kept to an absolute minimum when connecting or disconnecting the loading hose.

The 7193K-10B is intended to be permanently attached to the filling hose.

Ordering Information

Part Number	Application	Inlet Connection	Outlet Connection	Materials
7193K-10B	Lever Operated for Quick Filling of Fork Lift Cylinders	¼" F. NPT	Quick Disconnect Yoke*	Brass and Steel

* For use with RegO 7141M check connector.

Combination Valve for Bulk Storage Containers A2805C

Designed for installation on bulk storage containers, this valve combines a pressure gauge mounting and provision for a fixed tube liquid level gauge.

The shut-off valve prevents the pressure gauge from being subjected to constant pressure, thereby prolonging its life and accuracy. The valve may be closed, and the vent valve opened to vent pressure from the gauge to permit replacement.

For fixed liquid level gauging, the valve can be mounted at the maximum permitted filling level. When equipped with a dip tube threaded $\frac{1}{8}$ " M.NPT, it can be installed at any convenient level.



A2805C

Ordering Information

Part Number	Container Connection	Service Connection	Liquid Level Vent
A2805C	$\frac{3}{4}$ " M. NPT	$\frac{1}{4}$ " F. NPT for Gauge Mounting	Tee Handle

*Has $\frac{1}{8}$ " F. NPT opening for installing separate dip tube.

Gritrol Fuel Line Filters 12802

Designed especially for use in liquid motor fuel lines to trap foreign material which otherwise may damage precision components in the LP-Gas carburetion system. These filters incorporate an integral sintered metal filter element in a straight through design.



12802

Ordering Information

Part Number	Inlet Connection	Outlet Connection
12802	$\frac{1}{4}$ " F. NPT	$\frac{1}{4}$ " M. NPT

Vent Valves 3165C, 3165D, 3165S and TSS3169

Especially designed to bleed off liquid or vapor pressures trapped in transfer lines. When installed in the downstream boss of RegO globe and angle valves used at the end of a liquid transfer hose, the bleeder valve allows for the controlled venting of the product and indicates to the operator that the valves are closed and he can disconnect the coupling. They may also be used as a fixed liquid level gauge where the dip tube is part of the container.

The 3165C, 3165S and TSS3169 incorporates a No 54 drill size orifice. The 3165D incorporates a No 72 drill size orifice.

An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.



3165C



3165S



TSS3169

Ordering Information

Part Number	Service	Connection	Actuation	Accessories
				Warning Plate Kit
3165C	LP-Gas Only	$\frac{1}{4}$ " M. NPT	Ribbed	2550-40P
3165D			Slotted	
3165S			Tee Handle	
TSS3169	LP-Gas & NH ₃			

Fixed Liquid Level Gauges 3165 Series and TA3169F

Especially designed to provide a visible warning when containers are filled to the maximum permitted filling level. At the start of the filling operation, with the vent stem opened, the valve discharges vapor. When the maximum permitted filling level is reached, the valve discharges liquid. The 3165CF*, 3165CF12.0, 3165SF12.0 and TA3169F12.0 incorporate a No 54 drill orifice; the 3165DF* and 3165DF12.0 incorporate a No 72 drill orifice. They all are normally furnished with a 12" 3/16" OD dip tube.

An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.



3165CF12.0
3165DF12.0



TA3169F12.0

Ordering Information

Part Number	Service	Connection	Actuation	Dip Tube Length	Accessories
					Warning Plate Kit
3165CF*	LP-Gas Only	¼" M. NPT	Ribbed	*	2550-40P
3165DF*					
3165CF12.0			Slotted	12"	
3165DF12.0					
3165SF12.0	LP-Gas & NH3		Tee Handle		
TA3169F12.0					

Spanner Wrench for ACME Connectors 3195-50

This aluminum spanner wrench is especially designed for use with 2 1/4" and 3 1/4" ACME couplings, adapters and caps.



3195-50

Ordering Information

Part Number	For Use With ACME Connector Size
3195-50	2 1/4" & 3 1/4"

Pressure Gauges

Especially designed in a variety of sizes and construction for the LP-Gas and anhydrous ammonia industry.



612-PG



5575

Ordering Information

Part Number	Service	Case Material	Maximum Pressure (psig)	Maximum Pressure (barg)	Inlet Connection M.NPT	Case Size	Increment Divisions
2434A-2*	LP-Gas Only	Steel	35" w.c. (87.09 MBar) and 20 oz. (Dual)	35" w.c. (87.09 MBar) and 20 oz. (Dual)	1/4"	2 1/2"	1" w.c. (2.48 MBar) and 1 oz.
2434-2**							
3226A-3		Brass	30 psig	2.07 barg		2"	1/2 PSI
2411							
5575		Steel	60 psig	4.14 barg			1 PSI
5547							
5576		Brass	100 psig	6.89 barg		2"	2 PSI
1286		Steel					
948		Brass					
948B			300 psig	20.68 barg		2"	5 PSI
A8060	NH ₃ and LP-Gas	Steel	60 psig	4.14 barg	1/8"	2 1/2"	5 lb.
A8150			150 psig	10.34 barg			
A8400			400 psig	27.58 barg			
612-PG	LP-Gas Only		0-300 PSI	0-20.68 barg	1/8"	1 1/2"	30 PSI
612-G2						2"	5 PSI

* 1/4" Hose Connection
** 1/4" M. NPT Connection

Needle Valves 1224, 1316 and 1318

These valves are high quality, “true” throttling valves. Unlike most so-called needle valves, both the body seat and stem are tapered to provide fine, precise control over a wide range of adjustment without stem galling.

The 1224 may be used as a small, inexpensive shut-off valve between a pressure gauge and bulk storage container to allow for convenient gauge replacement.

The 1316 and 1318 provide taper pipe thread by left hand hose connection threads and are useful in a wide range of torch and fuel burner applications where an accurate throttling action is required.



1224

Ordering Information

Part Number	A. Inlet Connection	B. Outlet Connection	C. Height	D. Length
1224WA	1/4" M. NPT	1/4" M. NPT	1 9/16"	1 3/4"
1316WA	9/16" - 18 L.H.	1/8" M. NPT		
1318WA		1/4" M. NPT		

J

Cross Reference by Part Number

302.....	21	970AXS.....	110	3144-9P.....	107	5766E.....	108	7556R12.0.....	40
302V.....	21	970HT.....	23	3144-91.....	107	5766F.....	108	7560-55.....	53
302V9.....	21	970HT.....	110	3146.....	82	5767F.....	108	7560-56.....	53
302V9LS.....	21	970JR.....	110	3146S.....	82	5767G.....	108	7572-400.....	84
597FA.....	21	970S.....	23	3165C.....	122	5767H.....	108	7572C-14A.....	76
597FB.....	21	970S.....	110	3165CF.....	123	5767M.....	108	7572C-15A.....	76
597FC.....	21	970WXS.....	23	3165CF12.0.....	123	5768G.....	108	7573D.....	81
597FD.....	21	1212 KIT.....	24	3165D.....	122	5769H.....	106	7573DC.....	81
612-G2.....	123	1224WA.....	124	3165DF.....	123	5769HVB.....	106	7574.....	71
612-PG.....	123	1286.....	123	3165DF12.0.....	123	5769K.....	106	7574L.....	71
901-400.....	34	1300.....	111	3165S.....	122	5769K.....	108	7576.....	106
901C1.....	31	1316WA.....	124	3165SF12.0.....	123	5769M.....	106	7577V.....	106
901C3.....	32	1318WA.....	124	3170.....	82	5769M.....	108	7579P.....	77
901C5.....	32	1328.....	24	3171.....	104	5769VSS.....	106	7579S.....	80
903-400.....	34	1328.....	111	3171A.....	104	5776.....	107	7580F-20.....	76
903-500.....	34	1331.....	24	3174-9P.....	107	5778.....	107	7583G.....	48
907FP.....	107	1331.....	111	3174-91.....	107	5807.....	20	7590U.....	74
912FA20.....	23	1332.....	24	3174-93.....	107	5808.....	20	7590U-10.....	76
912FA20.....	109	1332.....	111	3174C.....	80	5820.....	20	7590U-20.....	76
912FS12.....	23	1350E.....	24	3175.....	104	5828.....	20	7591U.....	74
912FS12.....	109	1350R.....	24	3175A.....	104	5832.....	20	7605A-BT.....	118
912FS20.....	23	1450E.....	24	3175B.....	104	6016-60D.....	118	7605AP-15.....	118
912FS20.....	109	1450R.....	24	3175P.....	107	6016PN-50.....	118	7605AP-16.....	118
912FS30.....	23	1494-1.....	111	3176.....	82	6016PN-80.....	118	6016RM.....	118
912FS30.....	109	1519A2.....	70	3179A.....	106	6532A12.0.....	39	7647DC.....	79
912FS36.....	23	1519A3.....	70	3179B.....	106	6532A12.0/6532R12.0.....	39	7647SC.....	79
912FS36.....	109	1519A4.....	70	3180C.....	82	6532R12.0.....	39	7704LP.....	60
912JA20.....	109	1519B4.....	70	3181.....	104	6533A10.5.....	39	7704P.....	60
912JS12.....	23	1519C2.....	70	3181A.....	104	6533A10.5/6533R10.5.....	39	7705P.....	60
912JS12.....	109	1519C4.....	70	3183AC.....	81	6533A11.7.....	39	7706P.....	60
912JS20.....	23	1584VH.....	22	3184-90.....	107	6533A11.7/6533R11.7.....	39	7901T.....	57
912JS20.....	109	1584VL.....	22	3185.....	104	6533R10.5.....	39	7901TA.....	57
912JS36.....	23	1584VN.....	22	3188A.....	110	6533R11.7.....	39	7901TB.....	57
912JS36.....	109	1586VH.....	22	3188B.....	110	6542A12.0.....	39	7901TB.....	118
912PA20.....	23	1586VL.....	22	3188C.....	110	6542A12.0/6542R12.0.....	39	7901TC.....	57
912PA20.....	109	1586VN.....	22	3191.....	104	6542R12.0.....	39	7901TLA.....	57
912PA36.....	23	1588VH.....	22	3194-90.....	107	6543A11.1.....	39	7901TLB.....	57
912PA36.....	109	1588VL.....	22	3194-90G.....	107	6543A11.1/6543R11.1.....	39	7901TLC.....	57
912PA48.....	23	1588VN.....	22	3194-90GS.....	107	6543A11.7.....	39	8117.....	63
912PA48.....	109	1708C.....	107	3194-91L.....	107	6543A11.7/6543R11.7.....	39	8118P.....	63
912PS12.....	23	2070C0.....	113	3194-91S.....	107	6543R11.1.....	39	8532AG.....	52
912PS12.....	109	2071-L25.7.....	113	3194-91V.....	107	6543R11.7.....	39	8533AG.....	52
912PS20.....	23	2071-L39.7.....	113	3194C.....	80	6555R10.6.....	38	8542AG.....	52
912PS20.....	109	2139.....	72	3195.....	104	6555R11.6.....	38	8542G.....	52
912PS30.....	23	2139A.....	72	3195-50.....	123	6555R12.0.....	38	8543G.....	49
912PS30.....	109	2302-31.....	24	3197C.....	80	6584C.....	80	8543T.....	49
912PS36.....	23	2411.....	123	3199W.....	23	6586D.....	83	8544A375T.....	49
912PS36.....	109	2434-2.....	123	3199W.....	74	6587EC.....	80	8544G.....	49
912PS48.....	23	2434A.....	24	3199W.....	110	6588LE.....	109	8544K.....	49
912PS48.....	109	2434A-2.....	123	3200C.....	94	6589LE.....	109	8544T.....	49
913JS05.....	23	2503-19.....	24	3200L.....	94	7053T.....	57	8545AK.....	49
913JS05.....	23	2503-22.....	24	3226A-3.....	123	7141F.....	105	8546G.....	49
913JS05.....	109	2723C.....	73	3272E.....	71	7141FP.....	107	8546T.....	49
913JS05A.....	23	2884D.....	74	3272F.....	71	7141M.....	105	8555D10.6.....	38
913JS05A.....	109	2906A.....	111	3272G.....	71	7142LF.....	105	8555D11.6.....	38
913JS12.....	109	2906D.....	111	3272H.....	71	7142LM.....	105	8555DL11.6.....	38
913JS20.....	109	2906E.....	111	3282A.....	71	7177.....	118	8555DL11.6.....	38
913KL12.....	23	2906F.....	111	3282B.....	71	7188.....	118	8555R10.6.....	38
913KL12.....	109	2906G.....	111	3282C.....	71	7188-21.....	118	8555R11.6.....	38
913LS12.....	23	2962.....	25	3292A.....	71	7188HS.....	118	8556.....	32
913LS12.....	109	3119A.....	105	3292B.....	71	7188MS.....	118	8593AL16.0.....	37
913PS05.....	109	3120.....	105	3705RC.....	106	7193D.....	118	8593AL16.0.....	37
913PS05A.....	23	3121.....	105	5547.....	123	7193D-10.....	120	8684G.....	48
913PS05A.....	109	3125L.....	51	5575.....	123	7193D-10L.....	118	8685G.....	48
913PS12.....	23	3127G.....	51	5576.....	123	7193D-10L.....	120	9101C1.....	31
913PS12.....	109	3127G.....	51	5726B34.....	21	7193K-10B.....	121	9101D11.1.....	31
913PS12G.....	23	3127H.....	51	5727B34.....	21	7193L-10A.....	121	9101D11.7.....	31
913PS12G.....	109	3127J.....	51	5754B4.....	21	7193T-10.....	120	9101H3.....	32
913PS12H.....	23	3127K.....	51	5755B4.....	21	7193U-10.....	120	9101H5.....	32
913PS12H.....	109	3127K.....	51	5760A.....	111	7193U-10L.....	120	9101H6.....	32
913PS12S.....	23	3127L.....	51	5760B.....	111	7194-1.....	118	9101P5.....	33
913PS12S.....	109	3127P.....	51	5760C.....	111	7194H-3.....	118	9101P5H.....	33
913PS20.....	23	3127U.....	51	5760D.....	111	7194HD.....	118	9101P6.....	33
913PS20.....	109	3129G.....	51	5760S.....	111	7194M-3A.....	118	9101P6H.....	33
913PS30.....	23	3129G.....	51	5761A.....	111	7194MD.....	118	9101R1.....	31
913PS30.....	109	3129H.....	51	5761B.....	111	7501L.....	78	9101R11.1.....	31
913PS36.....	23	3129J.....	51	5761C.....	111	7502L.....	78	9101R11.7.....	31
913PS36.....	109	3129K.....	51	5761D.....	111	7525B4.....	19	9101Y5H.....	32
913PS48.....	23	3129K.....	51	5763D.....	108	7525B4.....	19	9102D11.1.....	31
913PS48.....	109	3129L.....	51	5764A.....	108	7525B34.....	19	9102R11.7.....	31
948.....	123	3129P.....	51	5764B.....	108	7525B34.....	19	9103D10.6.....	30
948B.....	123	3129U.....	51	5764C.....	108	7534B.....	50	9103D11.6.....	30
970.....	23	3131G.....	50	5764D.....	108	7534G.....	50	9103T9F.....	30
970.....	110	3132G.....	50	5764E.....	108	7550P.....	61	9104PPA.....	33
970AW.....	23	3133G.....	50	5764W.....	108	7550PX.....	61	9104PT10.1.....	33
970AW.....	110	3135G.....	50	5765D.....	108	7551P.....	61	9104PT10.7.....	33
970AWXS.....	110	3135MG.....	52	5765E.....	108	7554LAV.....	57	9106CO.....	30
970AX.....	23	3139-18.....	23	5765F.....	108	7554LV.....	57	9107K8A.....	31
970AX.....	110	3139-26.....	23	5765M.....	108	7554SAV.....	57	10538P.....	106
970AXS.....	23	3139-38.....	23	5765PR.....	107	7554SV.....	57	12472.....	71

Cross Reference by Part Number

12802.....	122	A3219FA400L.....	95	A8012D.....	62	FA6016.....	116	LV5503G4.....	18
12982.....	110	A3219FA400W.....	95	A8013D.....	73	FA6024.....	116	LV5503H414.....	18
15774-1.....	111	A3219FA600L.....	95	A8013DA.....	73	FVA6010.....	116	LV5503H614.....	18
A1519A2.....	70	A3219FA600W.....	95	A8013DB.....	73	FVA6016.....	116	LV5503H620.....	18
A1519A4.....	70	A3219RT.....	95	A8016-9P.....	107	FVA6024.....	116	LV5503H620V.....	18
A1519A6.....	70	A3272G.....	71	A8016-93.....	107	G8475RL.....	37	LV5503H640.....	18
A1519B4.....	70	A3276BC.....	82	A8016DBC.....	62	G8475RL.....	37	LV5503H640V.....	18
A2137.....	72	A3282C.....	71	A8016DP.....	62	G8475RLW.....	37	LV5503H814.....	18
A2137A.....	72	A3292A.....	71	A8017DH.....	63	G8475RLW.....	37	LV5503H820.....	18
A2141A6.....	113	A3292B.....	71	A8017DLP.....	63	HA7513AP.....	59	LV5503H840.....	18
A2141A6L.....	113	A3292C.....	71	A8017DP.....	63	HA7514AP.....	59	LV5503Y6.....	18
A2141A8.....	113	A3400L4.....	83	A8018DP.....	63	HA7517AP.....	59	LV5503Y8.....	18
A2141A8L.....	113	A3400L6.....	83	A8020D.....	63	HA7518AP.....	59	M3131G.....	37
A2141A10.....	113	A3500L4.....	73	A8060.....	123	L6579.....	77	MV3132G.....	37
A2141A16.....	113	A3500N4.....	73	A8150.....	123	L6579.....	77	MV3132G.....	50
A2697-20R.....	77	A3500P4.....	73	A8400.....	123	L6579C.....	77	N970P.....	106
A2697-20R.....	81	A3500R6.....	73	A8434G.....	48	L7579.....	77	PG8475RL.....	37
A2797-20R.....	77	A3500T6.....	73	A8434N.....	48	L7579C.....	77	PT6542A12.0.....	39
A2797-20R.....	81	A3500V6.....	73	A8436G.....	48	LV404B4.....	19	PT6542A12.0/6542R12.0.....	39
A2805C.....	122	A4500Y8.....	73	A8436N.....	48	LV404B4V9.....	19	PT6542R12.0.....	39
A3146.....	82	A5764D.....	108	A8523.....	72	LV404B9.....	19	PT6543A11.1.....	39
A3149G.....	50	A5764E.....	108	A8525.....	72	LV404B9V9.....	19	PT6543A11.1/6543R11.1.....	39
A3149L055.....	50	A5764W.....	108	A8563AG.....	53	LV404B34.....	19	PT6543A11.7.....	39
A3149L200.....	50	A5765C.....	108	A8563G.....	53	LV404B34V9.....	19	PT6543A11.7/6543R11.7.....	39
A3149MG.....	50	A5765D.....	108	A8564AG.....	53	LV404B39.....	19	PT6543R11.1.....	39
A3175.....	104	A5765E.....	108	A8564G.....	53	LV404B39V9.....	19	PT6543R11.7.....	39
A3175A.....	104	A5765F.....	108	A8573AG.....	53	LV404B46.....	19	PT7556R12.0.....	40
A3175P.....	107	A5767F.....	108	A8573G.....	53	LV404B46V9.....	19	PT9102R1.....	31
A3176.....	82	A5768H.....	108	A8574AG.....	53	LV404B96.....	19	PT9102R11.1.....	31
A3184-8R.....	77	A5769H.....	108	A8574G.....	53	LV404B96V9.....	19	PT9102R11.7.....	31
A3184-90.....	107	A5769K.....	108	A9091-18L.....	112	LV404Y9.....	20	SF7647V11.0.....	78
A3185.....	104	A5776.....	107	A9091-18LX.....	112	LV404Y39.....	20	SF7647V11.1.....	78
A3186.....	82	A6010.....	116	A9091-18N.....	112	LV960-48.....	24	SFL7579V10.6.....	79
A3187S.....		A6016.....	116	A9091-M24.0.....	112	LV960-72.....	24	SFL7579V11.1.....	79
A3194-8R.....	77	A6024.....	116	A9091-M36.0.....	112	LV960-120.....	24	SFL7579V12.3.....	79
A3194-90.....	107	A6586D.....	83	A9091-M48.0.....	112	LV3403B4.....	17	SFL7579V13.0.....	79
A3194-91L.....	107	A7505AP.....	59	A9091-M60.0.....	112	LV3403B4V0.....	17	SFL7579V13.8.....	79
A3194-91S.....	107	A7506AP.....	59	A9091-M72.0.....	112	LV3403B4V3.....	17	SS8001G.....	51
A3194-91V.....	107	A7507AP.....	59	A9091R.....	112	LV3403B4V9.....	17	SS8001J.....	51
A3195.....	104	A7508AP.....	59	A9092R.....	112	LV3403B44R.....	17	SS8001L.....	51
A3196.....	82	A7509BP.....	59	A9093RS.....	112	LV3403B46R.....	17	SS8001U.....	51
A3198S.....		A7510BP.....	59	A9093TS.....	112	LV3403TR.....	15	SS8002G.....	51
A3209D050.....	92	A7511AP.....	59	A9094RS.....	112	LV3403TRV9.....	15	SS8002J.....	51
A3209D080.....	92	A7511FP.....	59	A9094TS.....	112	LV4403-400.....	25	SS8002L.....	51
A3209DT050.....	92	A7512AP.....	59	A9095RS.....	112	LV4403B1D.....	16	SS8002U.....	51
A3209DT080.....	92	A7513AP.....	59	A9095TS.....	112	LV4403B3D.....	16	SS8021G.....	51
A3211D080.....	92	A7513FP.....	59	AA1584VH.....	22	LV4403B3RD.....	16	SS8021J.....	51
A3211D110.....	92	A7514AP.....	59	AA1584VL.....	22	LV4403B4.....	15	SS8021L.....	51
A3212R 105.....	93	A7514FP.....	59	AA1584VW.....	22	LV4403B4D.....	16	SS8021U.....	51
A3212R 175.....	93	A7517AP.....	59	AA1586VH.....	22	LV4403B5D.....	16	SS8022G.....	51
A3212R 250.....	93	A7517FP.....	59	AA1586VL.....	22	LV4403B16D.....	16	SS8022J.....	51
A3212R T105.....	93	A7518AP.....	59	AA1586VW.....	22	LV4403B16RABD.....	16	SS8022L.....	51
A3212R T175.....	93	A7518FP.....	59	AA3126L030.....	50	LV4403B16RAD.....	16	SS8022P.....	51
A3212R T250.....	93	A7537L4.....	72	AA3126L250.....	50	LV4403B16RD.....	16	SS8022U.....	51
A3213D150.....	93	A7537L4F.....	72	AA3126L312.....	50	LV4403B36D.....	16	T3132G.....	50
A3213D200.....	93	A7537N4.....	72	AA3130UA250.....	50	LV4403B36RABD.....	16	TA3169F12.0.....	123
A3213D300.....	93	A7537N4F.....	72	AA3130UA265.....	50	LV4403B36RAD.....	16	TA7034LP.....	59
A3213D400.....	93	A7537P4.....	72	AA3135MA250.....	52	LV4403B46.....	15	TA7034P.....	59
A3213DT150.....	93	A7537P4F.....	72	AA3135MA265.....	52	LV4403B46D.....	16	TA7505AP.....	59
A3213DT200.....	93	A7539R6.....	72	AA3135MUA250.....	52	LV4403B46R.....	15	TA7506AP.....	59
A3213DT300.....	93	A7539R6F.....	72	AA3135MUA265.....	52	LV4403B46RD.....	16	TA7507AP.....	59
A3213DT400.....	93	A7539T6.....	72	AA3135UA250.....	50	LV4403B56D.....	16	TA7509BP.....	59
A3217AL160.....	94	A7539T6F.....	72	AA3135UA265.....	50	LV4403B56RABD.....	16	TA7510BP.....	59
A3217AL210.....	94	A7539V6.....	72	AA8532MA250.....	52	LV4403B56RAD.....	16	TA7511AP.....	59
A3217AL260.....	94	A7539V6F.....	72	AA8532MA265.....	52	LV4403B56RD.....	16	TA7511FP.....	59
A3217AL410.....	94	A7550P.....	61	AA8533MA250.....	52	LV4403B66.....	15	TA7512AP.....	59
A3217AL510.....	94	A7550PX.....	61	AA8533MA265.....	52	LV4403B66D.....	16	TA7513AP.....	59
A3217ALPA.....	94	A7551P.....	61	AA8542UA250.....	52	LV4403B66R.....	15	TA7513FP.....	59
A3217ALPA.....	94	A7571LA.....	104	AA8542UA265.....	52	LV4403B66RA.....	17	TA7514FP.....	59
A3217AR160.....	94	A7571LB.....	104	C5763N.....	107	LV4403B66RAB.....	17	TA7517AP.....	59
A3217AR210.....	94	A7575L2.....	104	C5765N.....	107	LV4403B66RABD.....	16	TA7517FP.....	59
A3217AR260.....	94	A7575L3.....	104	C5767N.....	107	LV4403B66RAD.....	16	TSS3169.....	122
A3217AR410.....	94	A7575L4.....	104	C5769N.....	107	LV4403B66RD.....	16	VA6010.....	116
A3217AR510.....	94	A7575L5.....	104	D912J12.....	23	LV4403H222.....	16	VA6016.....	116
A3217ARPA.....	94	A7616.....	119	D912J20.....	23	LV4403H414.....	16	VA6024.....	116
A3217ARPA.....	94	A7624.....	119	D912J30.....	23	LV4403H420.....	16	VA8436G.....	48
A3217DAL160.....	94	A7704LP.....	60	D912P12.....	23	LV4403H4614.....	16	VA8436N.....	48
A3217DAL210.....	94	A7704P.....	60	D912P20.....	23	LV4403H4620.....	16	W3132G.....	50
A3217DAL260.....	94	A7705P.....	60	D912P30.....	23	LV4403H6614.....	16	X1584VL.....	22
A3217DAL410.....	94	A7706P.....	60	D913J12.....	23	LV4403SR4.....	15	X1584VN.....	22
A3217DAL510.....	94	A7707L.....	56	D913J20.....	23	LV4403SR9.....	15	X1586VL.....	22
A3217DAR160.....	94	A7708L.....	56	D913J20.....	23	LV4403SR96.....	15	X1586VN.....	22
A3217DAR210.....	94	A7793A.....	56	D913P12.....	23	LV4403TR4.....	15	X1588VL.....	22
A3217DAR260.....	94	A7794.....	119	D913P20.....	23	LV4403TR9.....	15	X1588VN.....	22
A3217DAR410.....	94	A7796.....	119	D913P30.....	23	LV4403TR96.....	15		
A3217DAR510.....	94	A7797A.....	56	EA3209D050.....	90	LV4403Y4.....	18		
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