

# **REGGO**<sup>®</sup>

*LP-Gas & Anhydrous Ammonia Equipment*

**Regulators and Accessories**

**Cylinder and Service Valves**

**Multivalve<sup>®</sup> Assemblies**

**Pressure Relief Valves and Relief Valve Manifolds**

**Globe and Angle Valves**

**Excess Flow, Check, Filler and Vapor Equalizing Valves**

**Internal Valves and Accessories**

**Adapters, Connectors and Fittings**

**Miscellaneous Equipment (Including Rotogages and ESVs)**



## Foreword

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This catalog describes a complete line of equipment available from REGO® for use with LP-Gas and anhydrous ammonia (NH<sub>3</sub>). 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 NH<sub>3</sub> 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 NH<sub>3</sub> service only.
  - c. All other products are suitable for use with LP-Gas service.
  - d. “SS” prefix—Hydrostatic relief valve with this prefix are suitable for NH<sub>3</sub> 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 NH<sub>3</sub>. If you have a need for use of another application, contact REGO®, 100 RegO Drive, Elon, NC 27244, (336) 449-7707 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.

### 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.

### 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.

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### 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.

## 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 — 1 <sup>st</sup> week
B — 2 <sup>nd</sup> week
C — 3 <sup>rd</sup> week
D — 4 <sup>th</sup> week
E — 5 <sup>th</sup> 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:** 6A92 = First week of June, 1992

## 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 LPGas 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 delivery pressure regulator and a line pressure regulator downstream to reduce 2 PSIG to appliance pressure

**Green** — High pressure pounds to pounds anhydrous ammonia regulator.



## Limited Warranty and Limitation Of Liability

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### 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 continuously 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

#### 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.

# RegO<sup>®</sup> Regulator Dependability

When RegO<sup>®</sup> 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 60 years.

RegO<sup>®</sup> Products are manufactured from the finest materials, and assembled and tested using procedures second to none.

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

RegO<sup>®</sup> LP-Gas Regulators are UL listed and comply with applicable code requirements.

RegO<sup>®</sup> Products offer a complete line of LP-Gas Regulators with capacities for almost every application.

# RegO<sup>®</sup> Regulator Selection

In order to properly size the RegO<sup>®</sup> 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
	935,000	LV4403B 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
	800,000	LV404Y9
Automatic Changeover	200,000	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

Temperature		Approx. Pressure (PSIG)		Temperature		Approx. Pressure (PSIG)	
°F	°C	Propane	Butane	°F	°C	Propane	Butane
-40	-40	3.6		40	4	72	3.0
-30	-34	8		50	10	86	6.9
-20	-29	13.5		60	16	102	12
-10	-23	23.3		70	21	127	17
0	-18	28		80	27	140	23
10	-12	37		90	32	165	29
20	-7	47		100	38	196	36
30	-1	58		110	43	220	45

stage regulator.

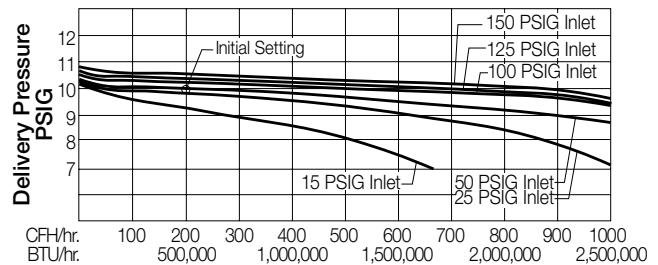
## Example for a First Stage Regulator

1. Assume a load of 500,000 BTU's per hour.
2. Assume a minimum delivery pressure of 9.5 PSIG.
3. Assume a minimum tank pressure of 15 PSIG.
4. For these conditions, refer to chart for the LV4403TR Series, First

Stage Regulator, shown below.

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. Since the delivery pressure will be 9.7 PSIG at the maximum load conditions and lowest anticipated tank pressure, the regulator will be sized properly for the demand.

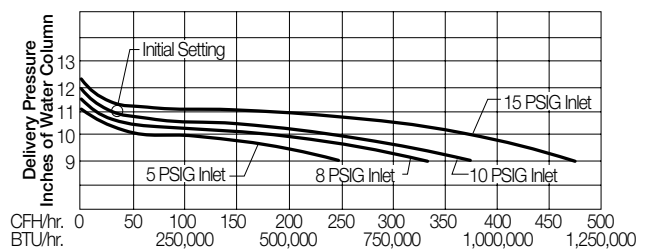
LV4403TR Series First Stage Regulator



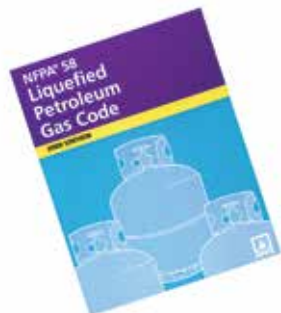
## Example for a Second Stage Regulator

1. Assume load of 250,000 BTU's per hour.
2. Assume a minimum delivery pressure of 10" w.c.
3. Assume a minimum inlet pressure of 10 PSIG.
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. Since the delivery pressure will be 10.6" w.c. 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 Pamphlet #58 - 2004 Edition, "Liquefied Petroleum Gas Code" states in Section 4.4 that, "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. The 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 be furnished with a copy of NPGA Safety Pamphlet 306, "LP-Gas Regulator and Valve Inspection and Maintenance."

## 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.**

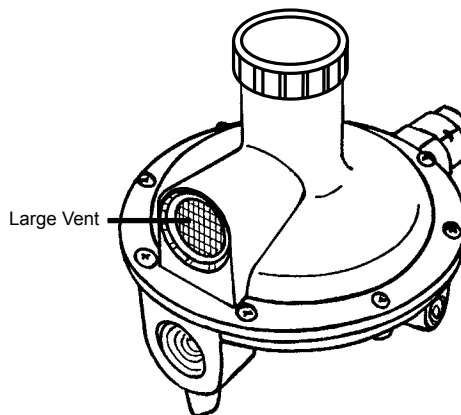
### The Causes of High Pressure Gas in a System are:

#### 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.**

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 assure 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. 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:

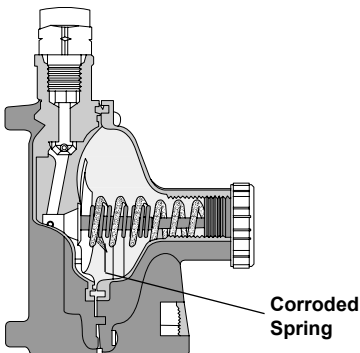
Adjusting springs and relief valve springs can rapidly corrode if exposed to salt air or industrial pollution. Even moisture condensation on these springs can cause them to rust and fail.

**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.

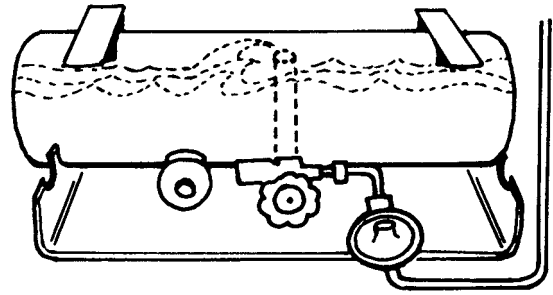
A casual inspection for corrosion can be made by examining the surface and looking into the bonnet after the bonnet cap has been removed. This sometimes will alert the inspector to corrosive conditions. Certainly the regulator should be examined in more detail by a qualified and trained technician. For single stage, second stage and twin stage regulators remove the bonnet cap and examine the inside of the bonnet with a strong flashlight. For first stage regulators that have a bonnet cap, shut down the system, remove the bonnet cap and spring and examine the inside of the bonnet with a strong flashlight. After the inspection, the regulator must be adjusted to the proper pressure.

**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



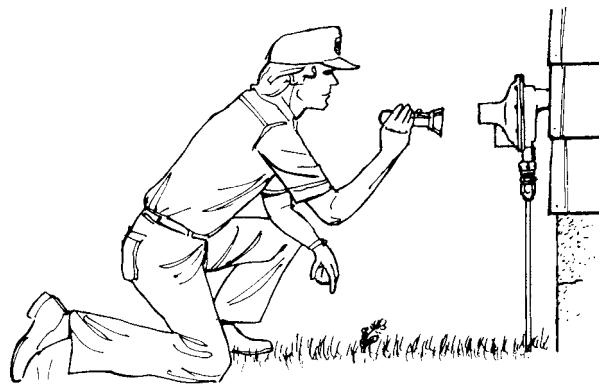
pressure downstream of the regulator. It could also occur on stationary installations if the regulator is installed below the shut-off valve and the container is over-filled.

**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.

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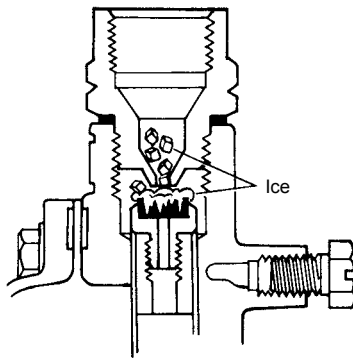
2. Bad piping connections at the regulator inlet and outlet. This can occur at the time of installation where connections are loose or the regulator may have been overstressed by excessive wrenching. It is important that proper wrenches, both on the piping and on the regulator inlet and outlet, be used 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.



## 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 pigtailed 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.

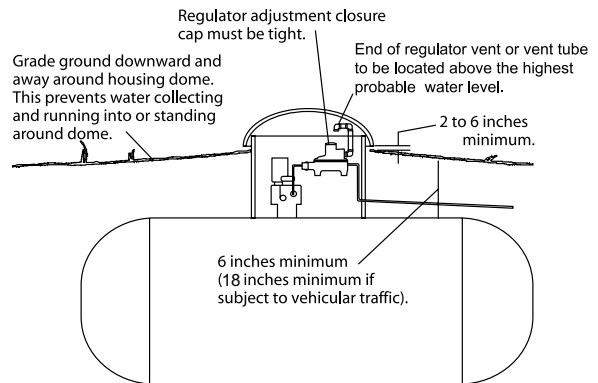
**Action Required:** All LP-Gas should be checked for moisture content prior to delivery to consumers and proper amounts of anhydrous methanol added if the gas cannot be returned to the supplier. Any container suspected of having excessive moisture should be treated with the proper amount of methanol.

## 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

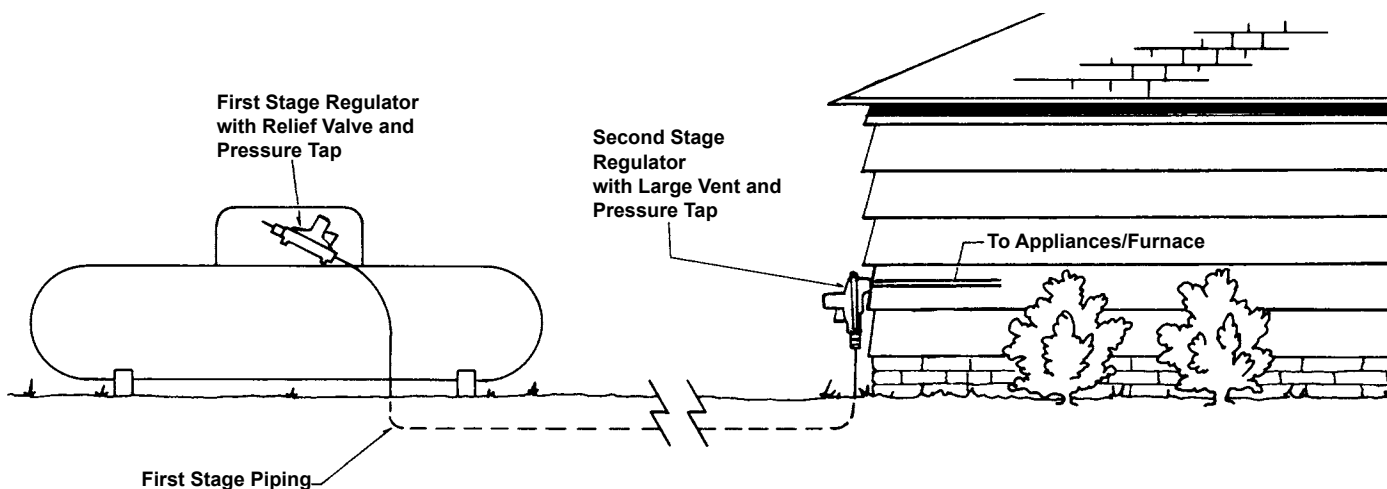
**All REGO® Products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of materials such as metal and rubber. As a general recommendation, Regulators should be replaced in accordance with all of the recommendations outlined 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 – and still deliver a steady flow of LP-Gas at 11" w.c. 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 pinpoint 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. using single-stage systems, two-stage systems keep pressure variations within 1" w.c. 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. 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. 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. 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 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

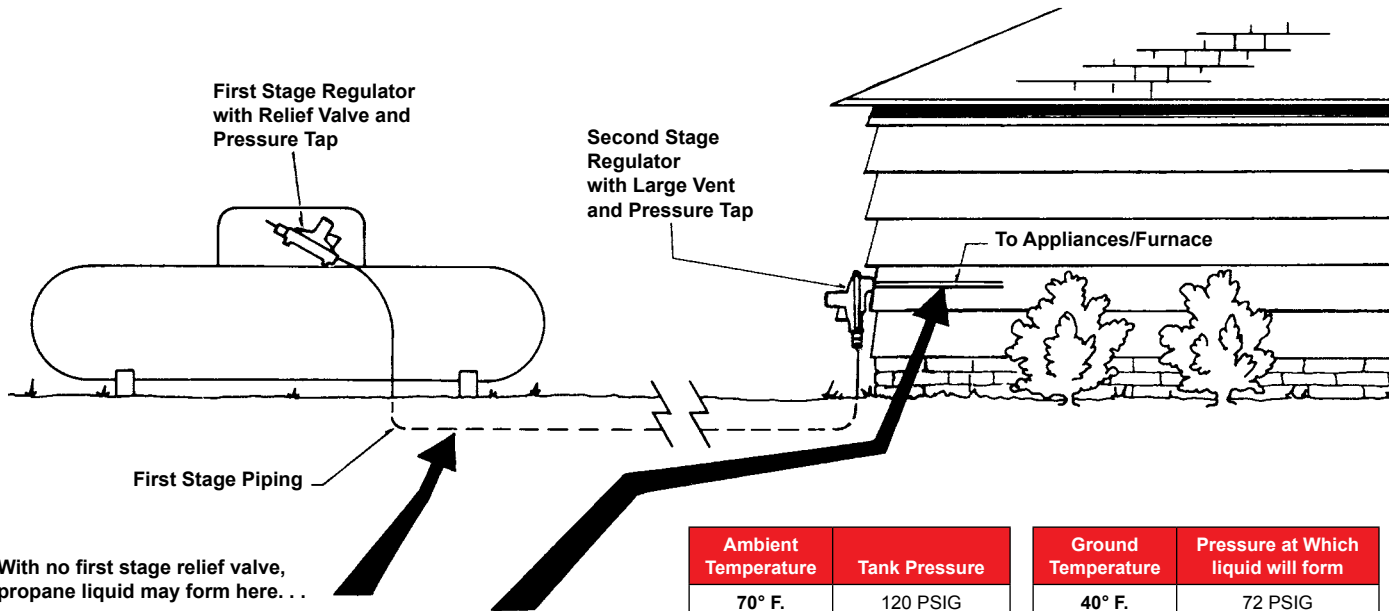
Prior to installing your two-stage system, be sure the system pipe and tubing is properly sized. Proper sizing will help ensure constant delivery pressure to the appliances during fluctuating loads at all times. Just as important, be sure the RegO® Regulators you choose are capable of handling the desired 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



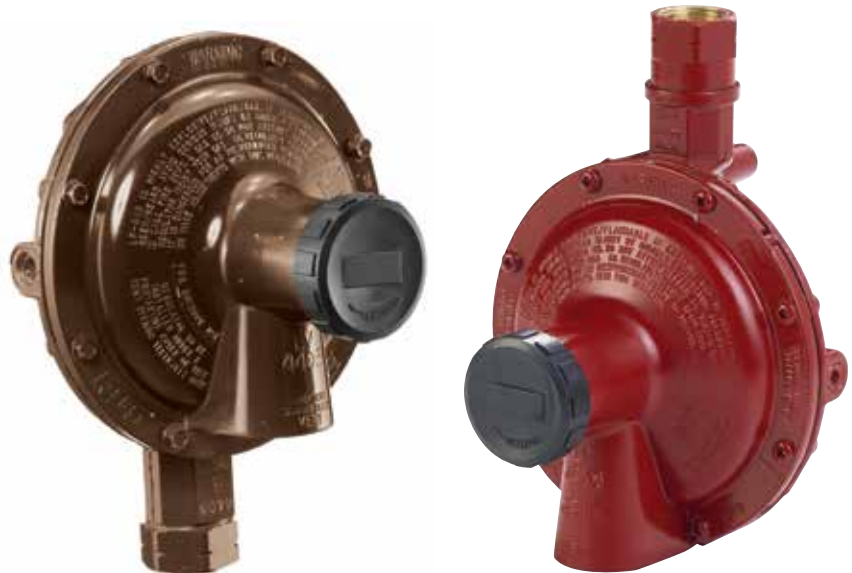
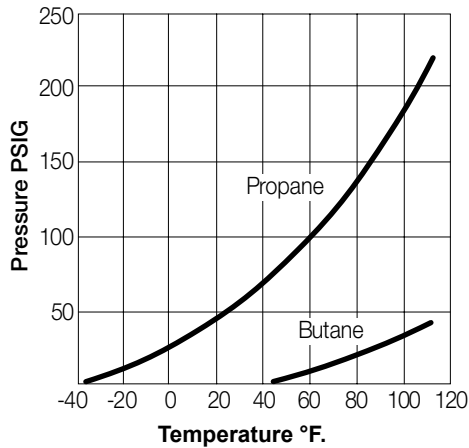
With no first stage relief valve, propane liquid may form here...

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	Ground Temperature	Pressure at Which liquid will form
70° F.	120 PSIG	40° F.	72 PSIG
80° F.	140 PSIG	50° F.	86 PSIG
90° F.	165 PSIG	60° F.	102 PSIG

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

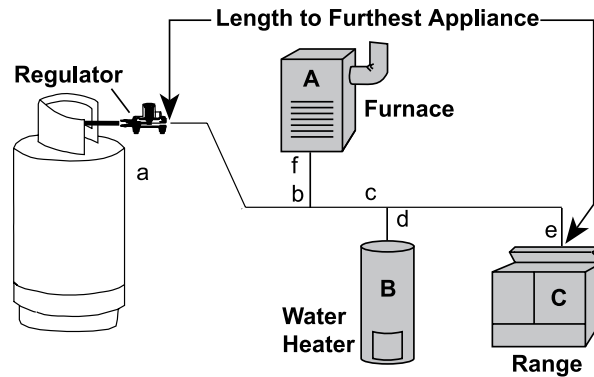
RegO® LV4403 Series First Stage Regulators with Built-In Relief Valves reduce the possibility of this serious hazard in two stage applications. The built-in relief valve is designed to vent as needed and reduce the possibility of first stage piping pressure from becoming high enough to form liquid.

# Pipe and Tubing Selection Guide

Use the following simple method to assure 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) piping between the 2 PSIG 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.

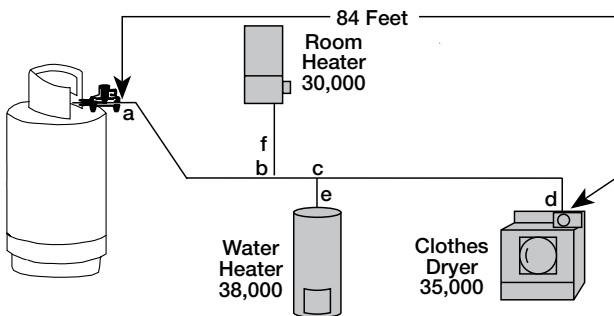


## Example 1

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

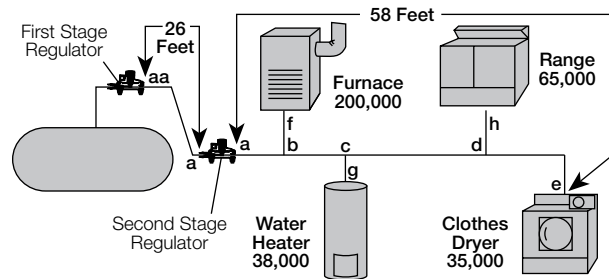
**Total piping length = 84 feet (use Table 3 @90 feet)**

From a to b, demand = 38,000 + 35,000 + 30,000 = 103,000 BTU/hr; use 3/4" pipe  
 From b to c, demand = 38,000 + 35,000 = 73,000 BTU/hr; use 1/2" pipe or 3/4" tubing  
 From c to d, demand = 35,000 BTU/hr; use 1/2" pipe or 5/8" tubing  
 From c to e, demand = 38,000 BTU/hr; use 1/2" pipe or 5/8" 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 10psig (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 7/8" tubing  
 From c to d, demand = 100,000 BTU/hr; use 1/2" pipe or 3/4" 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 or 7/8" tubing  
 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 5/8" 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 3/8" CSST or 1/2" copper tubing or 1/2" pipe

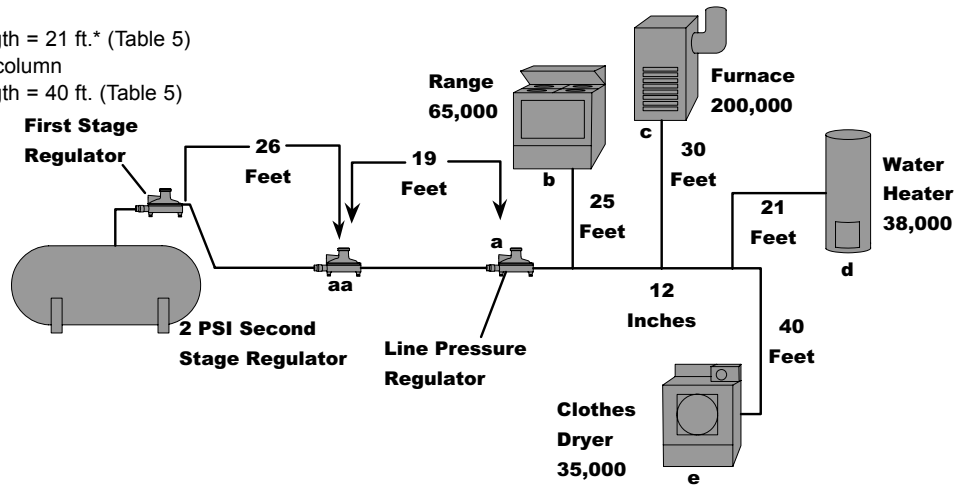
From Regulator a to each appliance:

From a to b, demand= 65,000 BTU; length = 25 ft. (Table 5),  
use 1/2" CSST

From a to c, demand= 200,000 BTU; length = 30 ft. (Table 5)  
use 3/4" CSST

From a to d, demand= 38,000 BTU; length = 21 ft.\* (Table 5)  
use 3/8" CSST \*use 25 ft. column

From a to e, demand= 35,000 BTU; length = 40 ft. (Table 5)  
use 1/2" CSST



**Table 1 – First Stage Pipe Sizing** (Between First and Second Stage Regulators) 10 PSIG Inlet with a 1 PSIG Pressure Drop Maximum capacity of pipe or tubing, in thousands of BTU/hr or LP-Gas

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing, Feet																				
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400	
Copper Tubing (O.D.)	3/8"	558	383	309	265	235	213	196	182	171	161	142	130	118	111	104	90	89	89	82	76
	1/2"	1387	870	700	599	531	481	443	412	386	365	323	293	269	251	235	222	211	201	185	172
	5/8"	2360	1622	1303	1115	988	896	824	767	719	679	601	546	502	467	438	414	393	375	345	321
	3/4"	3993	2475	2205	1887	1672	1515	1394	1297	1217	1149	1018	923	843	790	740	700	664	634	584	543
Pipe Size	1/2"	3339	2295	1843	1577	1398	1267	1165	1084	1017	961	852	772	710	660	619	585	556	530	488	454
	3/4"	6982	4799	3854	3298	2923	2649	2437	2267	2127	2009	1780	1613	1484	1381	1296	1224	1162	1109	1020	949
	1"	13153	9040	7259	6213	5507	4989	4590	4270	4007	3785	3354	3039	2796	2601	2441	2305	2190	2089	1922	1788
	1 1/4"	27004	18560	14904	12756	11306	10244	9424	8767	8226	7770	6887	6240	5741	5340	5011	4733	4495	4289	3945	3670
	1 1/2"	40461	27809	22331	19113	16939	15348	14120	13136	12325	11642	10318	9349	8601	8002	7508	7092	6735	6426	5911	5499
	2"	77924	53556	43008	36809	32623	29559	27194	25299	23737	22422	19871	18005	16564	15410	14459	13658	12971	12375	11385	10591

\* 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).

Notes: 1) To allow 2 PSIG pressure drop, multiply total gas demand by .707, and use capacities from table. 2) For different first stage pressures, multiply total gas demand by the following factors, and use capacities from table. Ex: 1,000,000 BTU load at 5 PSI: 1,000,000 (1.12) = 1,200,000 BTU then use chart bases on 1,200,000 BTU

First Stage Pressure PSIG	Multiply By
20	.844
15	.912
5	1.120

Data Calculated per NFPA #54 & 58

**Table 2 – First Stage Plastic Tubing Sizing** 10 PSIG Inlet with a 1 PSIG Pressure Drop Maximum capacity of plastic tubing in thousands of BTU/hr of LP-Gas

Size of Plastic Tubing	NPS	SDR	Length of Tubing, Feet*																		
			10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350
1/2 CTS	7.00	1387	954	762	653	578	524	482	448	421	397	352	319	294	273	256	242	230	219	202	188
1/2	9.33	3901	2681	2143	1835	1626	1473	1355	1261	1183	1117	990	897	826	778	721	681	646	617	567	528
3/4	11.00	7811	5369	4292	3673	3256	2950	2714	2525	2369	2238	1983	1797	1653	1539	1443	1363	1294	1235	1136	1057
1 CTS	11.00	9510	6536	5225	4472	3864	3591	3304	3074	2884	2724	2414	2188	2013	1872	1757	1659	1576	1503	1383	1287
1	11.00	14094	9687	7744	6628	5874	5322	4896	4555	4274	4037	3578	3242	2983	2775	2603	2459	2336	2228	2050	1907
1 1/4	10.00	24416	16781	13416	11482	10106	9220	8433	7891	7404	6994	6199	5616	5167	4807	4510	4260	4046	3860	3551	3304
1 1/2	11.00	-	-	20260	17340	15368	13924	12810	11918	11182	10562	9361	8482	7803	7259	6811	6434	6111	5830	5363	4989
2	11.00	66251	45534	36402	31155	27612	25019	23017	21413	20091	18978	16820	15240	14020	13043	12238	11560	10979	10474	9636	8965

\* 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.

First Stage Pressure PSIG	Multiply By
20	.844
15	.912
5	1.120

Data Calculated per NFPA #54 & 58

# Pipe and Tubing Selection Guide

**Table 3 – Second Stage or Integral Twin Stage Pipe Sizing** 11 Inches Water Column Inlet with a 1/2 Inch Water Column Drop Maximum capacity of pipe or tubing in thousands of BTU/hr of LP-Gas

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing, Feet																				
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400	
Copper Tubing (O.D.)	3/8"	49	34	27	23	20	19	-	16	-	14	12	11	-	10	-	9	-	8	7	7
	1/2"	110	76	61	52	46	42	38	36	33	32	28	26	-	22	-	19	-	18	16	15
	5/8"	206	141	114	97	86	78	71	67	62	59	52	48	-	41	-	36	-	33	30	28
	3/4"	348	239	192	164	146	132	120	113	105	100	89	80	-	69	-	61	-	55	51	47
	7/8"	536	368	296	253	224	203	185	174	161	154	137	124	-	106	-	94	-	85	78	73
Pipe Size	1/2"	291	200	161	137	122	110	102	94	87	84	74	67	62	58	54	51	48	46	43	40
	3/4"	608	418	336	287	255	231	212	198	185	175	155	141	129	120	113	107	101	97	89	83
	1"	1146	788	632	541	480	435	400	372	349	330	292	265	244	227	213	201	191	182	167	156
	1 1/4"	2353	1617	1299	1111	985	892	821	764	717	677	600	544	500	465	437	412	392	374	344	320
	1 1/2"	3525	2423	1946	1665	1476	1337	1230	1144	1074	1014	899	815	749	697	654	618	587	560	515	479
	2"	6789	4666	3747	3207	2842	2575	2369	2204	2068	1954	1731	1569	1443	1343	1260	1190	1130	1078	992	923

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

Data Calculated per NFPA #54 & 58

**Table 4-Maximum Capacity of CSST** In Thousands of BTU per hour of undiluted LP-Gases Pressure of 2 psi and a pressure drop of 1 psi (Based on a 1.52 Specific Gravity Gas)\*

Size	EHD** Flow Designation	Length of Pipe or Tubing, Feet														
		10	20	30	40	50	75	80	110	150	200	250	300	400	500	
3/8"	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	
1/2"	18	927	591	540	469	420	344	333	298	245	213	191	173	151	135	
	19	1106	701	640	554	496	406	393	350	287	248	222	203	175	158	
3/4"	23	1735	1120	1027	896	806	663	643	578	477	415	373	343	298	268	
	25	2168	1384	1266	1100	986	809	768	703	575	501	448	411	355	319	
1"	30	4097	2560	2331	2012	1794	1457	1410	1256	1021	880	785	716	616	550	
	31	4720	2954	2692	2323	2072	1685	1629	1454	1182	1019	910	829	716	638	

Table does not include effect of pressure drop across the line regulator. If regulator loss exceeds 1/2 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.

CAUTION: Capacities shown in table may exceed maximum capacity for a selected regulator. Consult with regulator or tubing manufacturer for guidance.

\*Table includes losses for four 90-degree bends and two end fittings. Tubing runs with 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.

**Table 5-Maximum Capacity of CSST** In Thousands of BTU per hour of undiluted LP-Gases Pressure of 11 Inch Water Column and a Pressure Drop of 0.5 Inch Water Column (Based on a 1.52 Specific Gravity Gas)\*

Size	EHD** Flow Designation	Length of Pipe or Tubing, Feet																
		5	10	15	20	25	30	40	50	60	70	80	90	100	150	200	250	300
3/8"	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
1/2"	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
3/4"	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
1"	30	744	521	422	365	325	297	256	227	207	191	178	169	159	123	112	99	90
	31	863	605	490	425	379	344	297	265	241	222	208	197	186	143	129	117	107

\*Table includes losses for four 90-degree bends and two end fittings. Tubing runs with 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.

**Table 6 – Copper Tube Sizing or Schedule 40 Pipe Sizing\*** In Thousands of BTU per hour of undiluted LP-Gases 2 PSIG inlet with a 1PSIG pressure drop (Between 2 PSIG service regulator & line pressure regulator).

Size of Pipe or Copper Tubing, Inches	Length of Pipe or Tubing, 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.)	3/8"	451	310	249	213	189	171	157	146	137	130	104	89	79	72	66	61	58	54	49	45
	1/2"	1020	701	563	482	427	387	356	331	311	294	236	202	179	162	149	139	130	123	111	102
	5/8"	1900	1306	1049	898	795	721	663	617	579	547	439	376	333	302	278	258	242	229	207	191
	3/4"	3215	2210	1774	1519	1346	1219	1122	1044	979	925	743	636	563	511	470	437	410	387	351	323
	1/2"	2687	1847	1483	1269	1125	1019	938	872	819	773	621	531	471	427	393	365	343	324	293	270
Pipe Size	3/4"	5619	3862	3101	2654	2352	2131	1961	1824	1712	1617	1298	1111	985	892	821	764	717	677	613	564
	1"	10585	7275	5842	5000	4431	4015	3694	3436	3224	3046	2446	2093	1855	1681	1546	1439	1350	1275	1155	1063
	1 1/4"	21731	14936	11994	10265	9098	8243	7584	7055	6620	6253	5021	4298	3809	3451	3175	2954	2771	2618	2372	2182
	1 1/2"	32560	22378	17971	15381	13632	12351	11363	10571	9918	9369	7524	6439	5707	5171	4757	4426	4152	3922	3554	3270
	2"	62708	43099	34610	29621	26253	23787	21884	20359	19102	18043	14490	12401	10991	9959	9162	8523	7997	7554	6844	6297

# RegO® Regulator Designs

## Typical of the LV4403 Low Pressure Regulators and LV4403 High Pressure Regulators.

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

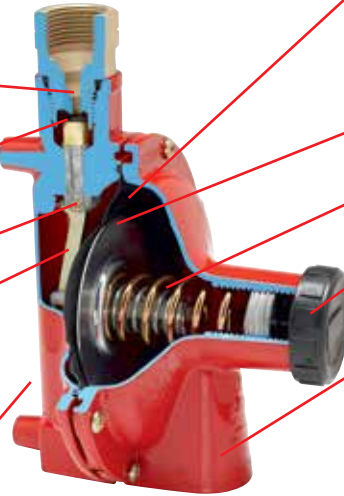
Provides quick response to diaphragm movement; moves directly perpendicular to nozzle orifice to meter gas flow, give positive closure and reduce seat disc wear.

### 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.

## 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

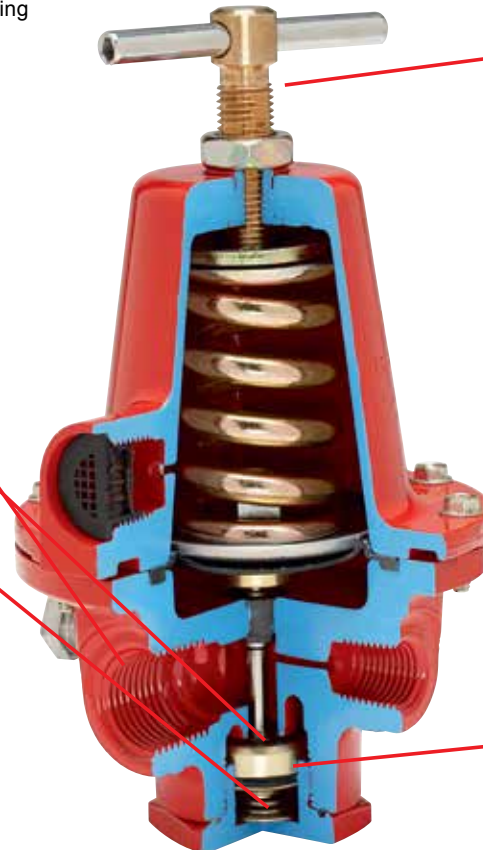
Machined and threaded into the body forging; also includes 1/4" NPT pressure gauge ports.

### 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.



### 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.

## 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.

## 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.



LV3403TR

### Ordering Information

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

\* Maximum flow based on inlet pressure 20 PSIG 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. 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)	Integral Relief Included	Vapor Capacity BTU/hr Propane**
LV4403SR4	1/2" F. NPT	1/2" F. NPT	1/4"	5	1-5	Yes	2,500,000
LV4403TR4				10	5-10		
LV4403SR9	5			1-5			
LV4403TR9	10			5-10			
LV4403SR96	F. POL	3/4" F.NPT		5	1-5		
LV4403TR96				10	5-10		

\* 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 higher than the regulator setting and delivery pressure 20% lower than the setting.

## Low Pressure Second Stage Regulators LV4403B Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. 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	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane**
LV4403B4	1/2" F. NPT	1/2"	#28 Drill	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	935,000
LV4403B46							
LV4403B46R*							
LV4403B66	3/4" F. NPT	3/4" F. NPT					
LV4403B66R*							

\* Backmount design

\*\* Maximum flow based on 10 PSIG inlet and 9" w.c. delivery pressure.

## Low Pressure Second Stage Regulators LV4403B66RA Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. 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	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV4403B66RA	¾" F. NPT	¾" F. NPT	¾/16"	11" w.c. at 10 PSIG Inlet	9" to 13" w.c.	Over Inlet	1,000,000
LV4403B66RAB**							

\* Maximum flow is based on 10 PSIG inlet and 9" w.c. delivery pressure.\*\*

\*\* Mounting Bracket Included.

The LV3403B4 is designed to reduce first stage pressure of 5-20 PSIG down to burner pressure normally 11" w.c. 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	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr *
LV3403B4	½" F.NPT	½" F.NPT	¼"	11" w.c. At 10 PSIG Inlet	9" w.c. 13"	Inlet	450,000
LV3403B4V3						3:00	
LV3403B4V0						Outlet	
LV3403B4V9						9:00	

\* Maximum flow based on 10 PSIG Inlet 9" w.c. delivery pressure



Attached to Vapor Meter



w/ Mounting Bracket



LV3403B4 Series

## Low Pressure Second Stage Regulators LV5503B Series

Designed to reduce first stage pressure of 5 to 20 PSIG down to burner pressure, normally 11" w.c. 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	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane
LV5503B4	½" F. NPT	¾" F. NPT	¼"	11" w.c. at 10 PSIG Inlet	9" - 13" w.c.	Over Inlet	1,600,000
LV5503B6		¾" F. NPT					
LV5503B8							

Maximum flow is based on 10 PSIG inlet and 9" w.c. delivery pressure.



LV5503B Series

## Second Stage Regulators for 2 PSI Systems LV4403Y and LV5503Y Series

Designed to reduce first stage pressure of 10 PSIG down to 2 PSIG. A line pressure regulator is required downstream to reduce the 2 PSIG to a nominal 11" W.C.

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane***
LV4403Y4	½" F. NPT	½" F. NPT	¼"	2 PSIG @ 10 PSIG Inlet	Over Inlet	1,000,000
LV4403Y46R*	½" F. NPT	¾" F. NPT	¼"	2 PSIG @ 10 PSIG Inlet	Over Inlet	1,000,000
LV5503Y6	¾" F. NPT	¾" F. NPT	¼"	2 PSIG @ 10 PSIG Inlet	Over Inlet	2,200,000
LV5503Y8	¾" F. NPT	1" F. NPT	¾/32"	2 PSIG @ 10 PSIG Inlet	Over Inlet	2,200,000

Maximum flow is based on 10 PSIG inlet pressure and 1.5 PSIG delivery pressure.



LV4403Y Series

LV5503Y 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.



LV5503G4 Series

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV5503G4	½" F. NPT	¾" F. NPT	¼"	15" w.c. at 15 PSIG Inlet	8" - 18" w.c.	Above Inlet	1,750,000

Maximum flow is based on 15 PSIG inlet pressure and 13" w.c. delivery pressure.

## Large Capacity Second Stage Regulators LV6503B Series

These regulators are designed to reduce gas pressure from the first stage regulator down to appliance pressure, normally 11" w.c. They are for use in LP-Gas applications.



LV6503 Series

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range	Bonnet Vent Position	Vapor Capacity BTU/hr. Propane*
LV6503B14	1½" F. NPT	1½" F. NPT	⅝"	11" w.c. at 10 PSIG Inlet	8½" - 14" w.c.	Over Inlet	8,000,000
LV6503B16	2" F. NPT	2" F. NPT					9,750,000

\* Maximum flow is based on 10 PSIG inlet and 20% droop.

## Compact Twin Stage Regulators LV404B4 and LV404B9 Series

This compact two-stage regulator is designed to reduce container pressure down to 11" w.c. 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.



LV404B4



LV404B4V9



LV404B9



### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	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	.219	11" w.c. at 100 PSIG Inlet	9" - 13" w.c.	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				.219	11" w.c. at 100 PSIG Inlet			9" - 13" w.c.	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 inlet pressure and 9" w.c. 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. 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.



LV404B39

LV404B34

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Orifice Size	Factory Delivery Pressure	Adjustment Range 2nd Stage	Bonnet Vent Position 1st stage **	Bonnet Vent Position 2nd stage**	Vapor Capacity BTU/hr *
LV404B34	1/4" F.NPT	1/2" F.NPT	.100	11" w.c. @ 100 Psig Inlet	9" to 13"w.c.	Rear	Outlet	450,000
LV404B39	F.POL					Left	9:00	
LV404B34V9	1/4" F.NPT							
LV404B39V9	F.POL							

\* Maximum flow based on 10 PSIG Inlet 9" w.c. delivery pressure

\*\* Other vent positions available upon request

## 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.



7525B4

7525B34

### 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 inlet pressure and 9" w.c. delivery pressure.

\*Not Included

## Two PSIG Delivery Pressure Twin-Stage Regulator LV404Y9

SPECIAL 2 PSIG DELIVERY pressure twin stage regulator is designed to reduce container pressure down to 2 PSIG. A line pressure regulator is required downstream to reduce the 2 PSIG to a nominal 11" W.C.



LV404Y9

### 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. HR*
LV404Y9	F.POL (CGA 510)	1/2" F.NPT	.219	2	1.8 to 2.5	Down	Outlet	800,000
LV404Y39			.100					650,000

Maximum flow is based on 25 PSIG inlet pressure and 1.5 PSIG delivery pressure.

## Two Stage Regulator Outfits 5807, 5808, 5820 Series

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



LV4403TR9

LV4403B Series

### 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 1/2" NPT	LV4403B4	1/2" x 1/2"	2503-22	913PS12	935,000
5808			LV4403B46R	1/2" x 3/4"			
5820			LV4403TR96	POL x 3/4" NPT	LV4403B66R		

2503-22

913PS12



## 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	1/4"	1/2"	912JS12	525,000
5832	LV404B34V9				400,000



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	
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	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. at 100 PSIG inlet	9-13" w.c.	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						



302V



302



Maximum flow is based on 25 PSIG inlet pressure and 9" w.c. delivery pressure.

## High Pressure Industrial / Commercial Pounds-to-Pounds Regulators 597F Series

Designed to reduce propane gas container pressure down to between 3 and 100 PSIG. 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)	Capacity Determined at Set Pressure of PSIG*	Capacity BTU/ hr. Propane**
597FA	Tee Handle	1/4" NPT	1/4" NPT	1-15	10	1,750,000
597FB				10-30	20	3,000,000
597FC				20-45	30	3,500,000
597FD				40-100	40	4,500,000



597 Series

\* Set pressure established at 100 PSIG 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 higher than the set pressure.



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

Designed to reduce LP-Gas and anhydrous ammonia container pressures to between 3 and 125 PSIG. Precision-built with a multi-million BTU capacity, the 1580M 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 AA1580M series is ideal for use in anhydrous ammonia applications such as blue print machines and heat treating.



1580M Series



## Ordering Information

Part Number	Service	Adjustment Method	Inlet & Outlet Connections	Recommended Delivery Pressure Range (PSIG)	A Width	B Height (max.)	Capacity Determined at Set Pressure of PSIG	Capacity**	
AA1582MW	NH <sub>3</sub>	Tee Handle	1/4" F. NPT	3-25	2 <sup>3</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>8</sub> "	20	2,100 CFH NH <sub>3</sub>	
AA1582MK		Hex Head		20-50			30	2,400 CFH NH <sub>3</sub>	
AA1582ML				45-125			60	2,600 CFH NH <sub>3</sub>	
AA1582MH									
1584VN	LP-Gas	Tee Handle	1/2" F. NPT	3-30	2 <sup>15</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>8</sub> "	20	7,000,000 BTU/hr. LPG	
1584VL				25-50			30	7,500,000 BTU/hr. LPG	
1584VH				45-125			60	8,000,000 BTU/hr. LPG	
AA1584VW	NH <sub>3</sub>				3-25			20	4,500 CFH NH <sub>3</sub>
AA1584VL					20-50			30	4,800 CFH NH <sub>3</sub>
AA1584VH					45-125			60	5,100 CFH NH <sub>3</sub>
1586VN	LP-Gas			3/4" F. NPT	3-30	3 1/2"	7"	20	11,000,000 BTU/hr. LPG
1586VL					25-50			30	12,000,000 BTU/hr. LPG
1586VH					45-125			60	14,000,000 BTU/hr. LPG
AA1586VW	NH <sub>3</sub>				3-25			20	7,000 CFH NH <sub>3</sub>
AA1586VL					20-50			30	7,700 CFH NH <sub>3</sub>
AA1586VH					45-125			60	8,900 CFH NH <sub>3</sub>
1588VN	LP-Gas		1" F. NPT	3-30			20	11,000,000 BTU/hr. LPG	
1588VL				25-50	30	12,000,000 BTU/hr. LPG			
1588VH				45-125	60	14,000,000 BTU/hr. LPG			

\* Set pressure is established with 100 PSIG inlet pressure and a flow of 500,000 BTU/hr. propane for 1580M Series, 90 CFH/hr. NH<sub>3</sub> for AA1582M Series and 180 CFH/hr. NH<sub>3</sub> for AA1584M and AA1586M Series.

\*\* Capacities determined at actual delivery pressure 20% less than set pressure with inlet pressure 20 PSIG higher than set pressure.

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.

# High Pressure / High Temperature Industrial / Commercial Pounds-to-Pounds Regulators X1584M, X1586M Series

Designed to reduce LP-Gas container pressures to between 3 and 50 PSIG. Ideal for vaporizer outlets, 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.

## Ordering Information

Part Number	Service	Adjustment Method	Inlet & Outlet Connections	Recommended Delivery Pressure Range (PSIG)	Capacity Determined at Set Pressure of PSIG*	Capacity BTU/hr. Propane**
X1584VN	LP-Gas	Tee Handle	1/2" F. NPT	3-30	20	7,000,000
X1584VL				25-50	30	7,500,000
X1586VN			3/4" F. NPT	3-30	20	11,000,000
X1586VL				25-50	30	12,000,000
X1588VN			1" F. NPT	3-30	20	11,000,000
X1588VL				25-50	30	12,000,000

\* Set pressure is established with 100 PSIG inlet pressure and a flow of 500,000 BTU/hr. propane.

\*\* Capacities determined at actual delivery pressure 20% less than set pressure with inlet pressure 20 PSIG higher than set pressure.

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.



X1584 Series

## Vapor Relief Valves 3139 Series

Designed for use as a relief valve on high pressure regulators to comply with the NFPA 58 5.1.9 "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."

Part Number	Set Pressure	Regulator Settings	Connection Size	Height	Width	Flow Capacity at 120% of Set Pressure (SCFH Propane)
3139-18	18 PSIG	10 PSIG	¼" M. NPT	2 <sup>27</sup> / <sub>32</sub> "	1 <sup>1</sup> / <sub>16</sub> "	1357*
3139-26	26 PSIG	15 PSIG				1725**
3139-38	38-PSIG	20 PSIG				2304***

\* Flow recorded at 21.6 PSI inlet pressure for this valve.  
 \*\* Flow recorded at 31.2 PSI inlet pressure for this valve.  
 \*\*\* Flow recorded at 45.6 PSI inlet pressure for this valve.



## Copper Pigtails 912 and 913 Series

### Straight Pigtails Ordering Information

Connections	Approximate Length	Part Number		
		¼" Tube		⅜" Tube
		⅞" Hex Short Nipple	1 <sup>1</sup> / <sub>8</sub> " Hex Long Nipple	⅞" 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	-	-
½" M.NPT x M.POL	20"	912JS20	-	-
	36"	912JS36	-	-
½" M.NPT x ⅜" M.NPT	12"	-	-	913LS12
½" M.NPT x ⅜" 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.

### Bent Pigtails Ordering Information

Connections	Approximate Length	Part Number		Type/Degree of Bend
		⅜" Tube	⅞" Hex Short Nipple	
¼" M. NPT x M. POL	5"	913JS05A	913PS05A	90°
		913PS12G	913PS12H	
M. POL x M. POL	12"	913PS12S	-	270° Right Hand
		-	-	270° Left Hand
-	-	-	-	360°

### Dialectric Pigtails



Part Number	Approximate Length	Tube	Connections
D912P12	12"	¼"	M.POL x M.POL
D912P20	20"		
D912P30	30"		
D912J12	12"		
D912J20	20"	⅜"	¼" M.NPT x M.POL
D912J30	30"		
D913P12	12"		
D913P20	20"		
D913P30	30"	⅜"	M.POL x M.POL
D913J12	12"		
D913J20	20"		
D913J30	30"		



913PS12



## Inlet Fittings

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.

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.
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.



## 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



## 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	LV2302, LV3403, LV404B3
2503-22	Plated Steel	LV404B4 LV404B9 Series, LV5503 Series
2503-19	Aluminum	LV4403 Series



2503-19



2503-22



2302-31

## 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	¼" Inverted Flare	¼" M. NPT



1450R



1350R

## Multiple Cylinder Manifolds 1350E and 1450E

Use with suitable pigtails 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	¼" Inverted Flare	¼" M. NPT



1450R



1350E

## Low Pressure Test Kit 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 — ¾" O.D. flexible synthetic rubber tube. Adapters are also available.

Part Number	Contents	Adapters
2434A	Test Kit	1328
		1331
		1332



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. **Contents**

- 1—Flexible water manometer which reads up to 16" w.c. of pressure.
- 1—Heavy duty, compact carrying case.
- 1—¾ oz. bottle of Fluorescein Green color concentrate.
- 2—1/8" pipe thread barbed tubing adapters.
- 1—3 foot, 3/16" rubber tube.
- 1—Rubber tubing adapter and 7/16" spud.

Part Number	Description
1212 KIT	Flexible Tube Water Manometer Kit



## High Pressure Gauge Adapter 2962

Designed for testing high pressure lines. Adapter has 0 to 300 PSIG 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)
2962	Soft Nose M. POL	F. POL	0 - 300




2962

## Adhesive Warning Labels

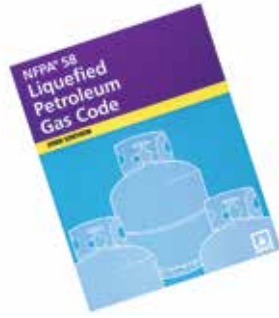
These adhesive warning labels are intended for application as close as possible to the LP-Gas regulator once the regulator has been installed.

Part Number	Description
LV4403-400	Adhesive Warning Label

<b>DANGER</b>	<b>WARNING</b>
<b>LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE</b>	
<small>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.</small>	
<small>Insist that your LP-Gas dealer regularly inspect and maintain this installation and properly instruct you in safety matters.</small>	
<small>Make sure ice, snow drifts, dirt, bugs and other foreign material do not obstruct vent passage-ways and openings. The vent opening must have a screen installed. If screen is missing, call your gas dealer for immediate examination and replacement.</small>	
<small>DO NOT REMOVE, DEFACE OR OBLITERATE THIS LABEL. DO NOT FILL CONTAINER UNLESS THIS LABEL IS READABLE.</small>	
<small>ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM</small>	
	<small>Printed in U.S.A. 04-0994-1189 Part Number LV4403-400</small>
<small>100 RegO Drive P.O. Box 247 Elon College, NC 27244 USA Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com</small>	

# 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.

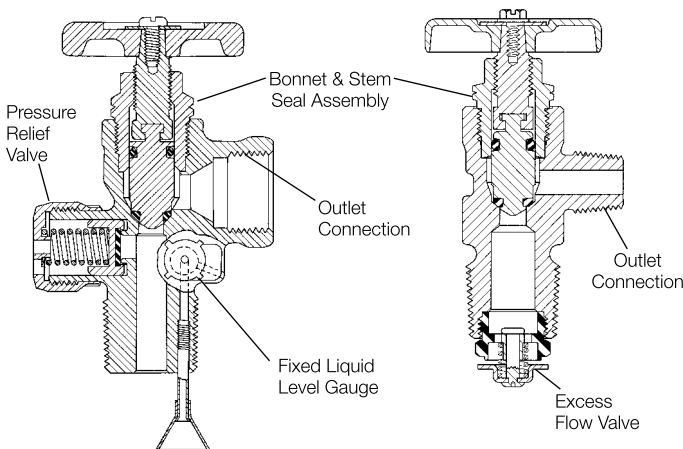
The National Fire Protection Association Pamphlet #58 - 2004 Edition, "Liquefied Petroleum Gas Code" states in Section 4.4 that, "persons who transfer liquid LP-Gas, who are employed to transport LP-Gas, or whose primary duties fall within the scope of this code shall be trained in proper handling procedures. Refresher training shall be provided at least every three years. The 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 be furnished with a copy of NPGA Safety Pamphlet 306, "LP-Gas Regulator and Valve Inspection and Maintenance."

## 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 assure 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 to be 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.

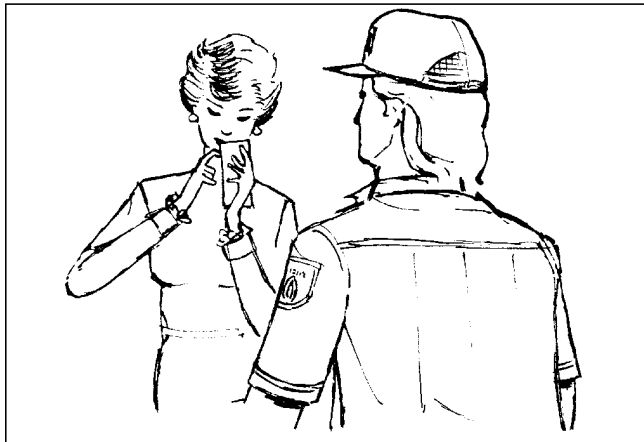
6. The fixed liquid level gauge on a cylinder valve is, when present, essential to prevent overfilling the cylinder. The gauging valve must operate freely, venting vapor when loosened, and sealing gas-tight easily when tightened with the fingers. Gauge valves meant for use with a socket key or screwdriver 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.

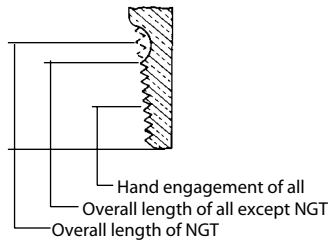
The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential. Because REGO® Products have a long and proven record of quality and service, LP-Gas dealers may forget the hazards that can occur because a cylinder valve is 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.

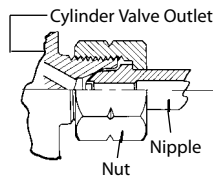
### Outlet Connections

#### 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 so designed to prevent the interchange of connections which may result in a hazard.

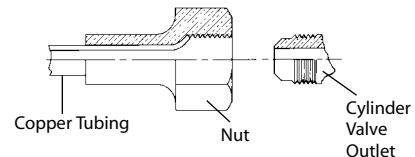
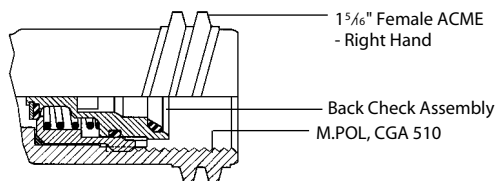
#### 3/8"-18 NPT Thread Connection

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



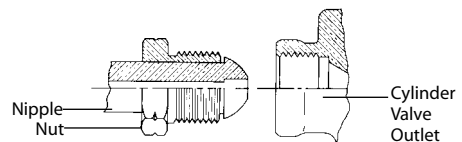
#### CGA 555

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 182, or SAE Flare

This connection assures a leak-tight joining of copper tubing to brass parts without 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 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 at 375 PSIG.

## 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 such options as pressure reliefs, liquid level gauges, and liquid withdrawal tubes. Also available for special applications are plumbers' pot valves, tamperresistant 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.

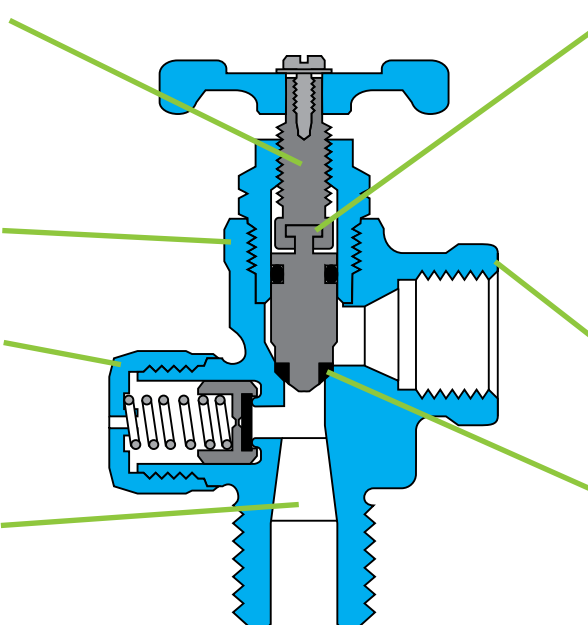
## Forged Brass Body

## 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.



9103D

### Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve	Dip Tube Length w/ Deflector	Pressure Relief Valve Setting	For Use in Cylinders w/Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Accessories
							Pressure Drop Across Valves				
							10 PSIG	25 PSIG	50 PSIG	100 PSIG	POL Plug
9103D10.6	3/4" M NGT	F. POL (CGA 510)	Yes	10.6"	375 PSIG	100 lbs.	12.7	20.3	29.0	41.3	N970P
9103D11.6				11.6"							

## 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	For Use in Cylinders w/Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM			
						Pressure Drop Across Valves			
						10 PSIG	25 PSIG	50 PSIG	100 PSIG
9103T9F	3/4" M. NGT	F. POL (CGA 510)	None	375 PSIG	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/air.



### Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Pressure Relief Valve Setting	For Use In Cylinders w/ Propane Capacity Up To	Flow Capacity SCFM/Air
9106CO	3/4" M. NGT	F. POL (CGA 510)	none	312 PSIG	ASME Tanks*	645

\* Surface area up to 23.8 square feet.

## 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.

### Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length w/ Deflector	Liquid Withdrawl Tube Length
9107K8A	3/4" M. NGT	CGA 555	Knurled	11.6"	44"

Pressure Relief Valve Setting	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	25 PSIG	50 PSIG	100 PSIG	25 PSIG Inlet	100 PSIG Inlet	
375 PSIG	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.



## "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.



### Ordering Information

Part Number	Container Connection	Service Connection		Fixed Liquid Level Vent Valve Style	Liquid Withdrawal Tube Length
		Vapor	Liquid		
8556	3/4" M. NGT	F. POL (CGA 510)	CGA 555	None	44"

Pressure Relief Valve Setting	For Use in Cylinders w/Propane Capacity Up To:	Approximate Filling Rate Liquid Flow, GPM				Liquid Closing Flow* (LP-Gas)
		Pressure Drop Across Valves				
		10 PSIG	25 PSIG	50 PSIG	100 PSIG	
375 PSIG	100 lbs.	6.6	10.0	14.5	21.0	2.3 GPM

\* 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 closing flow are for use in small and medium size lift truck applications, while those with 2.6 GPM 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 cylinders 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 insure 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				Accessories		
				Vapor		Liquid (GPM)	Pressure Drop Across Valve				ACME Check Connectors		
				25 PSIG Inlet (SCFH)	100 PSIG Inlet (SCFH)		10 PSIG	25 PSIG	50 PSIG	100 PSIG	Male	Female	Cap
9101P5	3/4" M. NGT	3/8" M. NPT	None	430	900	1.5	5.0	7.6	10.7	14.9	7141M	7141F	7141M-40 or 7141FP
9101P5H				550	1050	2.6							
9101P6			1/4" NPT	430	900	1.5	4.5	7.2	10.3	14.8			
9101P6H				550	1050	2.6							

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.

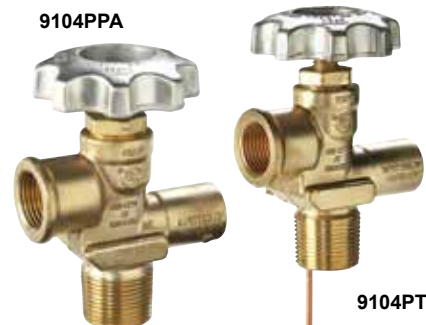
### Ordering Information

Part Number	Container Connection	Service Connection	Fixed Liquid Level Vent Valve Style	Dip Tube Length*	Pressure Relief Valve Setting	For use in Cylinders w/ Propylene Capacity up to:
9104PPA	3/4" M.NPT	F.POL - (CGA 510)	N/A	N/A	435 PSIG	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 = diptube size



9104PPA



9104PT

## Service Valves for ASME and DOT Containers or 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			
					Pressure Drop Across Valve			
					10 PSIG	25 PSIG	50 PSIG	100 PSIG
901C1	Standard	3/4" M. NGT	F. POL CGA 510	No	5.3	8.2	10.8	14.2
9101C1					8.8	12.4	15.8	21.7
9101D11.1				Yes	8.6	12.7	16.3	22.3
9101D11.7					MultiBonnet	7.6	11.7	15.2
9101R1	No							
9101R11.1	Yes							
9101R11.7	No							
PT9102R1	MultiBonnet			3/4" M. NGT	F. POL CGA 510	No	7.6	11.7
PT9102R11.1		Yes						
PT9102R11.7		No						
PT9102R11.1	Yes							



901C1

9101D



9101R1

PT9102

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.

## 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 insure 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
				25 PSIG Inlet (SCFH)	100 PSIG Inlet (SCFH)	
901C3	3/4" M. NGT	F. POL CGA 510	None	350***	605***	1.5***
901C5				550***	1050***	2.6***
9101H5*				765**	1300**	3.6**
9101H6*		3/8" SAE Flare	1/4" NPT	550****	1050****	2.6****
9101Y5H*		60° Angle 3/8" SAE Flare	None	765**	1300**	3.6**



901C5



9101H5



9101H6



9101Y5H

\* 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.

# 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

**DANGER LP GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE 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.

This container is filled with highly flammable LP-Gas under pressure. A serious fire or explosion can result from leaks and misuse or mishandling of the cylinder and its valve. Do not carry, hold, or lift the cylinder by its valve. Do not expose to fire or temperatures above 120° F (49° C). The cylinder is designed to contain a Shut-Off Valve and Pressure-Relief Valve. The Pressure-Relief Valve is designed to vent LP-Gas into the air if the cylinder is exposed to high temperatures—over 120° F (49° C), or if the overfilled condition is exposed to a temperature higher than the temperature of the time it was filled.

Do not allow any overfill. If the level of liquid is visible, use during filling should stop the moment a white LP-Gas cloud is emitted from its head hole. Keep the vent closed tightly at all other times. Each time the container is filled, it must be checked for leaks (with a high quality leak detection solution—leaks cause bubbles to grow).

Do not disconnect or connect this container without first reading the instructions accompanying the vehicle or appliance with which the container is intended to be used. CAUTION: no smoking while connecting or disconnecting this container.

Make sure the service valve is shut off tightly before beginning to assemble or disassemble the coupling. Liquid LP-Gas may flow or leak from the coupling. This liquid can cause skin burns, frostbite and other serious injuries in addition to those caused by fire and explosion. CAUTION: wear proper skin and eye protection. Any gasket or O-ring in the coupling must be routinely checked for wear and replaced as required.

When connecting the coupling, make sure the connection is leak tight. Check for leaks with a high quality leak detection solution (leak detection bubbles to grow). If the connection leaks after tightening, close the service valve, disconnect the coupling and remove from service.

When not in use, keep the service shut-off valve closed.

When in use, keep the service valve fully open.

Keep this equipment out of the reach of children.

This container must be used only in compliance with all applicable laws and regulations, including National Fire Protection Association Publication No. 58, which is the law in many states. A copy of this Publication may be obtained by writing NFPA, Batterymarch Park, Quincy, MA 02269.

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.

Make sure the protective cap is in place on the ACME Threaded filler valve at all times. Never install a device or insert other tools into the filler valve. Do not damage the seal or gaskets and cause an uncontrolled leak.

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** Printed in U.S.A. 05-0984-1096 Part No. 901-400  
100 Rego Drive, PO Box 247, Elon College, NC 27244 USA Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

**DANGER!**

AVOID SERIOUS INJURY AND PROPERTY DAMAGE. IF YOU SEE, SMELL, OR HEAR 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 OR OUTDOOR USE ONLY.

KEEP CYLINDER OUT OF THE REACH OF CHILDREN

LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

CAUTION: eyes protection must be worn when examining relief valve. This valve cannot be repaired. If it is obstructed, the entire cylinder valve must be replaced. The Shut-Off Valve may require periodic repair or replacement. Before the cylinder is filled for the first time, it must be purged of air. Total liquid volume must never exceed the amount designated by DOT for this cylinder.

If the cylinder has a fixed liquid level gauge, filling should stop the moment a white LP-Gas cloud is emitted from its bleed hole. Keep the vent valve closed tightly at all other times.

Keep this cylinder firmly secured in an upright position at all times. Do not lay on its side during transport, storage or use. In other than an upright position, liquid LP-Gas may flow or leak. This liquid can cause skin burns, frostbite and other serious injuries in addition to those caused by fire or explosion.

When not in use, Close the Shut-Off Valve. Insert protective plug (P.O.L. plug) into the cylinder valve outlet. (CAUTION—counter-clockwise thread).

This cylinder must be used only in compliance with all applicable laws and regulations, including National Fire Protection Association Publication No. 58, 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** Printed in U.S.A. 05-0984-1096 Part No. 903-400  
100 Rego Drive, PO Box 247, Elon College, NC 27244 USA Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

# 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 resist deterioration and provide 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 assure 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 for ASME use and 375 psig 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.

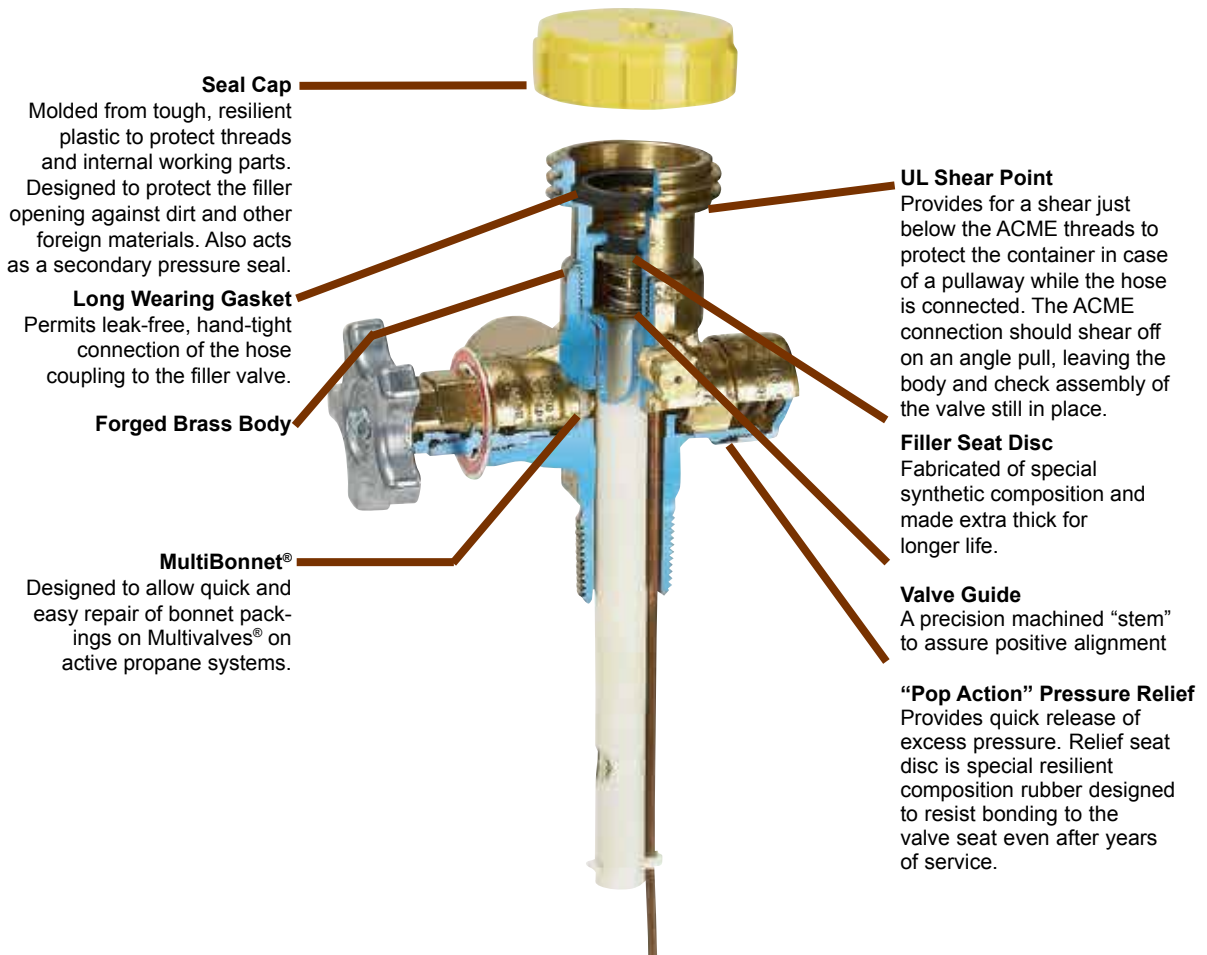
#### Ease of Maintenance —

- 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 ¼" NPT tapped opening for pressure gauge with or without steel plug.

## Design Features of RegO Multivalves®

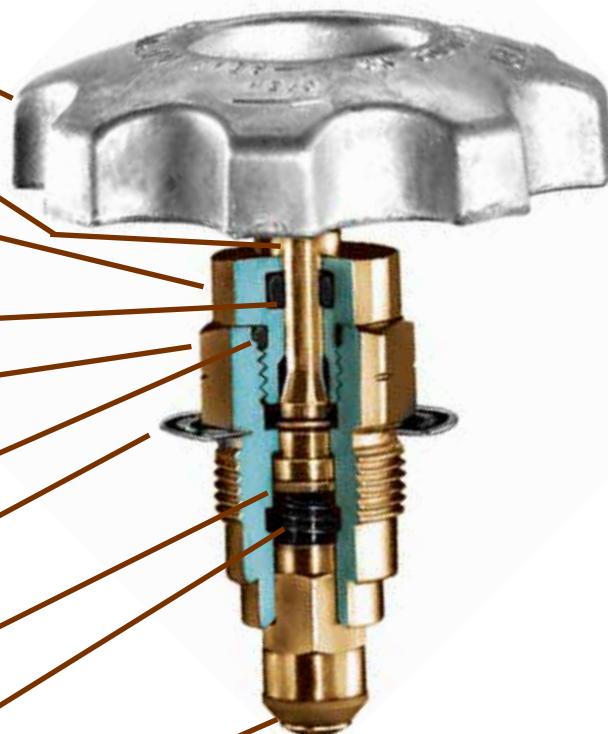




## RegO MultiBonnet® Assemblies

### 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.



### Application

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 G8475R Series

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.

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
<b>G8475RL</b>	42	72	98	125



### 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	Part Number	Flow Capacity		
						UL	ASME			UL	ASME			
<b>G8475RL</b>	2½" F. NPT	F. POL (CGA 510)	1¼" M. ACME	6¾"	1¼" M. ACME	4200 CFH @ 100 PSIG	Fits "JUNIOR" size	Yes	30**	250 PSIG	<b>M3131G</b>	2020 SCFM, air	1939 SCFM, air	83 sq. ft. above ground
<b>G8475RLW</b>														276 sq. ft. under ground

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

## 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.

### Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
<b>8593AR16.0</b>	42	72	98	125



8593AR



### 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			
<b>8593AL16.0</b>	1½" M. NPT	F. POL (CGA 510)	1¼" M. ACME	1¼" M. ACME	4200 CFH at 100 PSIG	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			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
<b>8555DL11.6</b>	8	23	34	42



### 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	For Use In Cylinders w/ Propane Capacity Up To:	Liquid Closing Flow (LP-Gas)***
<b>8555DL11.6</b>	¾" M. NGT	CGA 555*	1¼" M. ACME	Knurled	11.6"	44"	375 PSIG	100 lbs. **	1.7 GPM

\* 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.

## DOT 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.

### Liquid Filling Rates

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
8555D	8	23	34	42
8555R	8	23	34	42



### 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	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 PSIG	793 SCFM, air	700 SCFM, air
6555R11.6	MultiBonnet®			11.6"							
6555R12.0	MultiBonnet®			12.0"							
8555D10.6	Standard	DOT Cylinders	200 lbs. Propane **	10.6"							
8555R10.6	MultiBonnet®			10.6"							
8555D11.6	Standard			11.6"							
8555R11.6	MultiBonnet®			11.6"							
									375 PSIG	n/a	n/a

\*Per CGA Pamphlet S-1.1.

## DOT and ASME Multivalves® for Vapor Withdrawal 6532, 6533, 6542 and 6543 Series

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			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
6532A12.0/6532R12.0	11	16	23	28
6542A12.0/6542R12.0	23	32	46	57
6533A10.5/6533R10.5	11	16	23	28
6533A11.7/6533R11.7				
6543A11.1/6543R11.1	23	32	46	57
6543A11.7/6543R11.7				



### 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	For Use In Cylinders w/Propane Capacity Up To:**	For Use In Containers w/Surface Area Up To:***	
6532A12.0	Standard	ASME*	¾" M. NGT	F. POL (CGA 510)	1¾" M. ACME	Knurled	12.0"	250 PSIG	-	43 sq. ft.	
6532R12.0	MultiBonnet®										
6542A12.0	Standard		1" M. NGT							53 sq. ft.	
6542R12.0	MultiBonnet®										
6533A10.5	Standard	DOT	¾" M. NGT	F. POL (CGA 510)	1¾" M. ACME	Knurled	375 PSIG	420 lbs. Propane	-		
6533R10.5	MultiBonnet®										
6533A11.7	Standard										
6533R11.7	MultiBonnet®										
6543A11.1	Standard		1" M. NGT							11.1"	
6543R11.1	MultiBonnet®										
6543A11.7	Standard										11.7"
6543R11.7	MultiBonnet®										

\* UL rated flow capacities are: 6532A12.0-1180 SCFM/air, 6542A12.0-1530 SCFM/air.

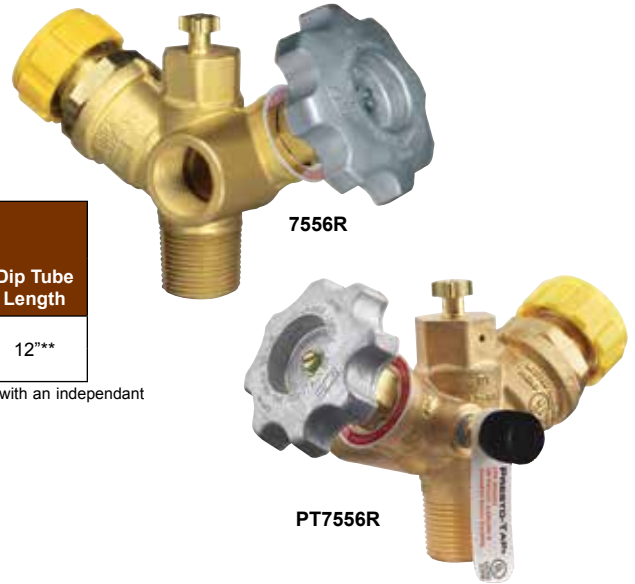
\*\* Per CGA Pamphlet S-1.1.

\*\*\* From NFPA, Appendix D.



# 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.



## Ordering Information

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

\* 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.

# Valves with Presto-Tap PG8475, PT7556 Series Valves

## PG8475 Series Multivalves

Designed for use in single opening ASME containers equipped with a 2 ½" 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.

Part Number	Approximate Filling Rate Liquid Flow, GPM			
	Pressure Drop Across Valve			
	10 PSIG	25 PSIG	50 PSIG	100 PSIG
PG8475RL	42	72	98	125



Part Number	Container Connection	Service Connection	Filling Connection	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	Part Number	Flow Capacity		
											UL	ASME	
PG8475RV	2½" F. NPT	F. POL (CGA 510)	1¼" M. ACME	1¼" M. ACME	4200 CFH @ 100 PSIG	Fits "JUNIOR" size	Yes	30"	250 PSIG	M3131G	2020 SCFM, air	1939 SCFM, air	83 sq. ft. above ground
PG8475RL													276 sq. ft. under ground

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

## 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 Pamphlet #58 - 2004 Edition, "Liquified Petroleum Gas Code" states in Section 1.5 that, "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. The training shall be documented. REGO® Warning Bulletins are useful in training new employees and reminding older employees of potential hazards.

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:

- CGA Pamphlet S-1.1 Pressure Relief Standards - Cylinders, Section 9.1.1.
- REGO® Catalog L-500.
- REGO® Warning # 8545-500.
- NPGA Safety Pamphlet 306 "LP-Gas Regulator and Valve Inspection and Maintenance" and "LP-Gas Training Guidebooks".
- NFPA # 58, "Storage and Handling of Liquefied Petroleum Gases".
- NFPA # 59, "LP-Gases at Utility Gas Plants".
- 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.

# RegO® Pressure Relief Valves

## Ordering RegO® Pressure Relief Valves

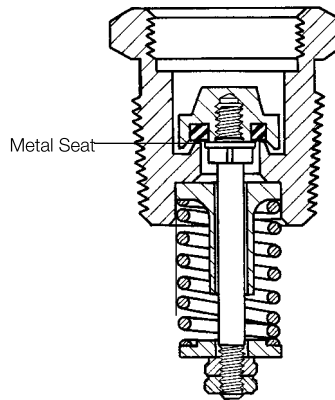
When ordering RegO® Pressure Relief Valves, be sure you are certain that it will sufficiently protect the container as specified in the forewording information, NFPA Pamphlet #58 and any other applicable standards or specifications.

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 is now entering its sixth decade 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 Don't Last Forever

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 reseat 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.

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

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.

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

Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air
20 or less	626	85	2050	150	3260	230	4630	360	6690	850	13540	1500	21570
25	751	90	2150	155	3350	240	4800	370	6840	900	14190	1550	22160
30	872	95	2240	160	3440	250	4960	380	7000	950	14830	1600	22740
35	990	100	2340	165	3530	260	5130	390	7150	1000	15470	1650	23320
40	1100	105	2440	170	3620	270	5290	400	7300	1050	16100	1700	23900
45	1220	110	2530	175	3700	280	5450	450	8040	1100	16720	1750	24470
50	1330	115	2630	180	3790	290	5610	500	8760	1150	17350	1800	25050
55	1430	120	2720	185	3880	300	5760	550	9470	1200	17960	1850	25620
60	1540	125	2810	190	3960	310	5920	600	10170	1250	18570	1900	26180
65	1640	130	2900	195	4050	320	6080	650	10860	1300	19180	1950	26750
70	1750	135	2990	200	4130	330	6230	700	11550	1350	19780	2000	27310
75	1850	140	3080	210	4300	340	6390	750	12220	1400	20380		
80	1950	145	3170	220	4470	350	6540	800	12880	1450	20980		

**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<sup>0.82</sup>. 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

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.

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

Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air
20	258	95	925	170	1500	290	2320	600	4200	1350	8160	2100	11720
25	310	100	965	175	1530	300	2380	650	4480	1400	8410	2150	11950
30	360	105	1010	180	1570	310	2450	700	4760	1450	8650	2200	12180
35	408	110	1050	185	1600	320	2510	750	5040	1500	8900	2250	12400
40	455	115	1090	190	1640	330	2570	800	5300	1550	9140	2300	12630
45	501	120	1120	195	1670	340	2640	850	5590	1600	9380	2350	12850
50	547	125	1160	200	1710	350	2700	900	5850	1650	9620	2400	13080
55	591	130	1200	210	1780	360	2760	950	6120	1700	9860	2450	13300
60	635	135	1240	220	1850	370	2830	1000	6380	1750	10090	2500	13520
65	678	140	1280	230	1920	380	2890	1050	6640	1800	10330		
70	720	145	1310	240	1980	390	2950	1100	6900	1850	10560		
75	762	150	1350	250	2050	400	3010	1150	7160	1900	10800		
80	804	155	1390	260	2120	450	3320	1200	7410	1950	11030		
85	845	160	1420	270	2180	500	3620	1250	7660	2000	11260		
90	885	165	1460	280	2250	550	3910	1300	7910	2050	11490		

**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<sup>0.82</sup> 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, semiinternal, 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 Delivery Trucks A8434 and A8436 Series

Designed specifically for use as a primary relief valve in ASME transports and delivery trucks with 2” and 3” NPT couplings.



A8434-SERIES



## Ordering Information

Part Number	Start To Discharge Setting PSIG	Container Connection	Overall Height (Approx.)	Height Above Coupling (Approx.)	UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	Suitable for Tanks with Surface Area Up To:*	Protective Cap (Included)
A8434N	265	2” M. NPT	9 1/16”	1/2”	3700	3659	175 Sq. Ft.	A8434-11B
A8434G	250					3456		
A8436N	265	3” M. NPT	17 7/8”	3/4”	10210	9839	602 Sq. Ft.	A8436-11B
A8436G	250					9598		

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

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

8543 Series relief valves are designed for use as a primary relief valve in larger ASME motor fuel containers such as on buses, 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.



7544-11A



7543-10

8544



## Ordering Information

Part Number	Container Type	Start To Discharge Setting PSIG	A Container Connection M. NPT	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	D Hex Wrenching Section	Flow Capacity SCFM/Air****		Protective Cap (Included)	Accessories
							UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)		Pipeway Adapter
8544G	ASME	250	1”	5 7/16”	7/8”	1 5/16”	1020	936	7544-41G	7544-11A*
8543G			1 1/4”			1 11/16”	1465	1400	7543-40C	7543-10**
8544T		312	1”			1 5/16”	1282	1158	7544-41	7544-11A
8543T			1 1/4”			1 11/16”	1990	1731	7543-40C	7543-10**
8544K	DOT/ASME	375	1”			1 5/16”	1545***	-	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 pipeway will reduce flow as discussed in forewording information.

## 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



### Ordering Information

Part Number	Container Type	Start To Discharge Setting PSIG	Container Connection M. NPT	Flow Capacity SCFM/Air** (REGO® Rated at 480 PSIG)	Accessories (Order Separately)		
					Protective Cap	Deflectors***	
					45° Elbow	90° Elbow	
8545AK	Dot	375	3/4"	400*	7545-40	7545-14	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 pipeways will reduce flow as discussed in forewording information.

\*\*\* Order protective cap #7545-40.

## Semi-Internal "Pop-Action" Pressure Relief Valves for ASME 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.



### Ordering Information

Part Number	Start To Discharge Setting PSIG	Container Connection M. NPT	Overall Height (Approx.)	Height Above Coupling (Approx.)	Wrench Hex Section	Flow Capacity SCFM/Air		Suitable for Tanks w/Surface Area Up To:**	Protective Cap (Included)
						UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)		
7583G	250	3/4"	8 <sup>3</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>16</sub> "	1 <sup>3</sup> / <sub>4</sub> "	1980	1806	80 Sq. Ft.	7583-40X
8684G		1"	9 <sup>3</sup> / <sub>16</sub> "	1 <sup>9</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	2620	2565	113 Sq. Ft.	8684-40
8685G		1 <sup>1</sup> / <sub>4</sub> "	11 <sup>1</sup> / <sub>16</sub> "	1 <sup>11</sup> / <sub>16</sub> "	2 <sup>3</sup> / <sub>8</sub> "	4385	4035	212 Sq. Ft.	7585-40X

\* 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 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 assures that the relief valve should always be capable of maximum flow under emergency conditions.



### Ordering Information

Part Number	Start To Discharge Setting PSIG	Container Connection M. NPT	Flow Capacity SCFM/Air*		Suitable for Tanks w/Surface Area Up To:**	Accessories	
			UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)		Protective Cap	Pipeway Adapter
7534G	250	2"	11,675	10,422	708 Sq. Ft.	7534-40	7534-20***

\* Flow rates shown are for bare relief valves. Adapters and pipeways will reduce flow as discussed in the forewording information.

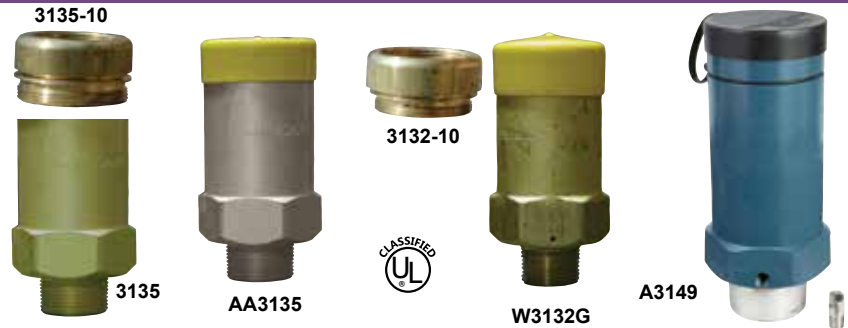
\*\* Per NFPA Pamphlet #58, Appendix D. Area shown is for UL or ASME—whichever is larger.

\*\*\* 3" F. NPT outlet connection.



# 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.



## Ordering Information

Part Number	Start To Discharge Setting PSIG	Container Connection M. NPT	Overall Height (Approx.)	Wrench Hex Section	Flow Capacity SCFM/Air (a)			Accessories					
					UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	Suitable for Tanks w/ Surface Area Up To: (e)	Protective Cap	Pipe Away Adapter		Weep Hole Deflector		
									Part Number	Outlet Size			
AA3126L030	30	1/2"	2 3/8"	7/8"	(b)	-	-	7545-40	AA3126-10	1/2" M. NPT	-		
A3149L55	55	2 1/2"	10 1/2"	4 1/8"	2608(c)	-	113 Sq. Ft.	3149-40	(h)		Included (j)		
A3149L200	200				8770 (c)	-	500 Sq. Ft.						
AA3126L250	250	1/2"	2 3/8"	7/8"	277 (c)	-	23 Sq. Ft. (f)	7545-40	AA3126-10	1/2" M. NPT	-		
3131G					2060	1939	85 Sq. Ft.	3133-41g	-				
AA3130UA250		3/4"	3 7/8"	1 3/4"	2045	1838	249 Sq. Ft. (f)	AA3130-40P	AA3131-10	1" F. NPT			
AA3130A250					-	1706 (10 OP)	-	AA3130-40P					
T3131G		1"	6 1/32"	2 3/8"	2060	1939	85 Sq. Ft.	3131-54	3132-54 (g)	3132-10		1 1/4" F. NPT	
W3132G					3340	-	154 Sq. Ft.	-					
3132G					4130	-	200 Sq. Ft.						
T3132G					3790	-	180 Sq. Ft.	3132-10					1 1/4" F. NPT
MV3132G					3995	-	190 Sq. Ft.	-					
3135G					5770	5549	300 Sq. Ft.						
AA3135UA250	1 1/2"	5 15/32"	3 1/8"	2 11/16"	6430	6341	1010 Sq. Ft. (f)	3135-54 (g)	3135-10	2" F. NPT	-		
3133G					AA3135-0PR	AA3135-10							
A3149G	2 1/2"	10 1/2"	4 1/8"	10390	9153	613 Sq. Ft.	3133-41g	3133-10	3133-11B				
AA3130UA265	265	3/4"	3 7/16"	1 3/4"	2125	1912	261 Sq. Ft. (f)	3149-40	(h)		Included (j)		
AA3135UA265					2125	1912	261 Sq. Ft. (f)	AA3130-40P	AA3131-10	1" F. NPT			
AA3135UA265	265	1 1/4"	6 13/32"	2 11/16"	6615	6703	1045 Sq. Ft. (f)	AA3135-40PR	AA3135-10	2" F. NPT	-		
AA3126L312					312	1/2"	2 3/8"	7/8"	330 (c)	-	27 Sq. Ft. (f)	7545-40	AA3126-10

- (a) Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in forewording information.
- (b) Not UL or ASME rated. .059 square inch effective area.
- (c) Not UL or ASME rated. REGO® rated at 120% of set pressure.
- (d) Per ANSI K61.1-1972, Appendix A.
- (e) Cap supplied with chain.
- (f) Outlet 3 1/2-8N (F) thread, will accept 3" M. NPT pipe thread.
- (g) Per NFPA Pamphlet #58, Appendix D. Area shown is for UL or ASME flow rating—whichever is larger.
- (h) Outlet 3 1/2-8N (F) thread, will accept 3" M. NPT pipe thread.
- (i) 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	Container Connection M. NPT	Overall Height (Approx.)	Wrench Hex Section	Flow Capacity SCFM/Air		Suitable for Tanks w/Surface Area Up To:*	Accessories		
						UL (At 120% of Set Pressure)	REGO® Rated at 480 PSIG***		Protective Cap	Pipeaway Adapter	
										Part Number	Outlet Size
3127G	ASME	250	1/4"	1 31/32"	7/8"	295	-	-	7545-40	-	-
3129G			1/2"	2 19/32"	1 1/8"	465	-	-		3129-10	1/2" F. NPT
3127K	DOT	375	1/4"	1 31/32"	7/8"	-	450	100 lbs. /Propane	7545-40	-	-
3129K			1/2"	2 19/32"	1 1/8"	780	200 lbs. /Propane	3129-10		1/2" F. NPT	

\* Flow rates shown are for bare relief valves. Adapters and pipeaways will reduce flow as discussed in forewording information.  
 \*\* Not UL or ASME rated. REGO® rated at 480 PSIG.  
 \*\*\* 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	Valve Body Material	Container Connection M. NPT	Height (Approx.)	Wrench Hex Section	Accessories	
						Protective Cap	Pipeaway
							Adapter or Threads
SS8001G	250	Stainless Steel	1/4"	7/8"	11/16"	-	-
SS8002G			1/2"		7/8"		-
SS8021G			1/4"	1 3/8"	11/16"		1/4" NPSM Thrds
SS8022G			1/2"		7/8"		3/8" NPT Thrds
3127G	275	Brass	1/4"	1 31/32"	7/8"	7545-40	-
3129G			1/2"	2 19/32"	1 1/8"		3129-10*
3127H			1/4"	1 31/32"	7/8"		-
3129H			1/2"	2 19/32"	1 1/8"		3129-10*
3127P	300	Brass	1/4"	1 31/32"	1 1/8"	-	-
3129P			1/2"	2 19/32"	1 1/8"		3129-10*
SS8022P			1/2"	1 3/8"	7/8"		3/8" NPT Thrds
3127J	350	Brass	1/4"	1 31/32"	7/8"	7545-40	-
3129J			1/2"	2 19/32"	1 1/8"		3129-10*
SS8001J		Stainless Steel	1/4"	7/8"	11/16"	-	-
SS8002J			1/2"		7/8"		-
SS8021J	Stainless Steel	1/4"	1 3/8"	11/16"	-	1/4" NPSM Thrds	
SS8022J		1/2"		7/8"		3/8" NPT Thrds	
3127K	375	Brass	1/4"	1 31/32"	7/8"	7545-40	-
3129K			1/2"	2 19/32"	1 1/8"		3129-10*
3125L	400	Brass	1/4"	1 9/16"	5/8"	Included	-
3127L			1/4"	1 31/32"	7/8"	7545-40	-
3129L			1/2"	2 19/32"	1 1/8"	3129-40P	3129-10*
SS8001L			Stainless Steel	1/4"	7/8"	11/16"	-
SS8002L	1/2"	7/8"		-			
SS8021L	1/4"	1 3/8"		11/16"	1/4" NPSM Thrds		
SS8022L	1/2"			7/8"	3/8" NPT Thrds		
3127U	450	Brass	1/4"	1 31/32"	7/8"	7545-40	-
3129U			1/2"	2 19/32"	1 1/8"		3129-10*
SS8001U	450	Stainless Steel	1/4"	7/8"	11/16"	-	-
SS8002U			1/2"		7/8"		-
SS8021U			1/4"	1"	11/16"		1/4" NPSM Thrds
SS8022U			1/2"		7/8"		3/8" NPT Thrds

\* 1/2" F. NPT outlet connection.



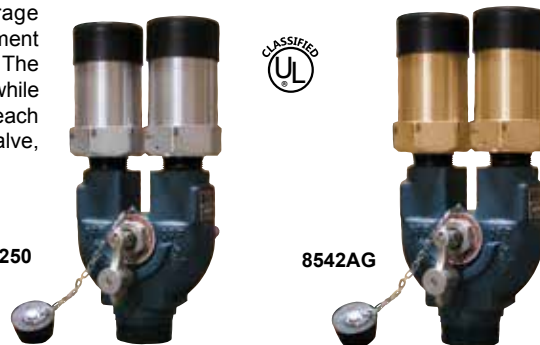
3125 Series (.161 Orifice)  
3127 Series (.274 Orifice)  
3129 Series (.386)



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.



AA85420A250

8542AG

### Ordering Information

Part Number	Start to Discharge Setting PSIG	Application		Container Connection M. NPT	Relief Valve Included				Flow Capacity SCFM/Air** (at 120% of set pressure)		
		LP-Gas	NH <sub>3</sub>		Quantity	Part Number	Inlet Connection M. NPT	Accessory Pipeway Adaptors	UL Rating (at 120% of set Pressure)	ASME Rating (at 120% of set Pressure)	
8542G	250	Yes	No	2"	2	3135MG	1 1/4"	3135-10*	5250 (1)	NA	
8542AG									NA	5549 (1)	
AA8542UA250	265	No	Yes						AA3135MUA250	6430 (1)	6341 (1)
AA8542UA265									AA3135MUA265	6615 (1)	6703 (1)

\* 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 pipeways will reduce flow rates as discussed in forewording information.

## 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"-ASA 300# Welding Neck Flange	8
7560-56			Manhold Cover Plate	

### Ordering Information

Part Number	Start To Discharge Setting PSIG	Application		Container Flange Connection	Relief Valve				Flow Capacity SCFM/Air** At 120% of Set Pressure	
		LP-Gas	NH <sub>3</sub>		Quantity	Part Number	Inlet Connection M. NPT	Accessories Pipeway Adaptors	UL Rating	ASME Rating
A8563G	250	Yes	Yes	3"-300#*	3	A3149MG	2 1/2"	****	18,500 (2)	Not Applicable
A8564G					4				27,750 (3)	
A8573G				3	18,500 (2)					
A8574G				4	27,750 (3)					
A8563AG				3"-300#*	3	A3149G			18,300 (2)	
A8564AG					4				27,400 (3)	
A8573AG				4"-300#	3	4			18,300 (2)	
A8574AG					4				27,400 (3)	

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

\*\*\* 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 pipeways will reduce flow rates as discussed in forewording information.

\*\*\*\* Outlet 3 1/2-8N (F) thread, will accept 3" M. NPT pipe thread.

# "V"-Ring Seal Globe and Angle Valves

## General Information

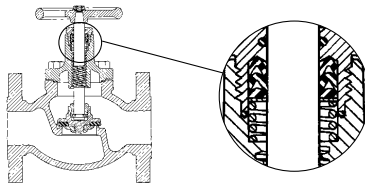
RegO® Globe and Angle Valves are designed and manufactured especially to meet the rigid requirements of the LP-Gas industry. The high quality construction and wide variety of sizes and styles also make them highly suited to many other industries such as anhydrous ammonia, chemical and petrochemical.

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 tensile strength which closely approaches that of steel castings. Its yield strength of 45,000 PSIG and elongation of 15% is also comparable to that of steel castings. These material features assure 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 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 assures 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 assure 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.

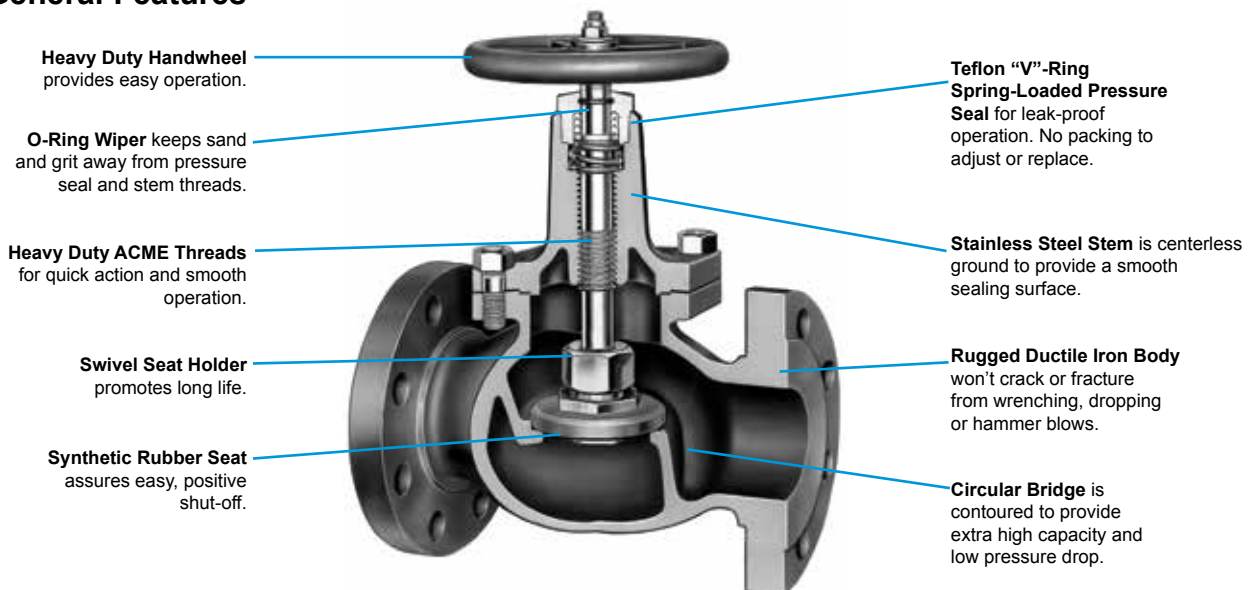
Hydrostatic Relief—When the design of the piping installation is such that liquid may be locked between two shut-off valves, a hydrostatic relief valve should be installed in the lines between the valves. The pressures which can develop due to temperature increase in a liquidfull line are tremendous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

## Application

Specifically designed to assure positive shut-off and long, maintenancefree 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.

## Features

- "V"-ring spring-loaded pressure stem seal provides for leak-proof operation. No packing to retighten or replace.
- Circular bridge in the globe design and a dropped seat in the angle design achieve greater flow with less pressure drop.
- Swivel seat disc assembly minimizes the seat disc from grinding on the body seat. The seat disc stops rotating as soon as it touches the body seat. This feature provides for good seat alignment and assures long seat life.
- ¼" F. NPT plugged bosses on the side of the valve body allow attachment of a hydrostatic relief valve or vent valve.
- "V"-ring stem seal virtually eliminates hard to turn handles frequently encountered with packed type seals.
- Heavy duty rolled ACME stem threads provide quick action and long service life.

## Materials

Body .....	Ductile Iron
Bonnet (7034, 7505-7508).....	Steel
Bonnet (7509-7518).....	Ductile Iron
Valve Stem .....	Stainless Steel
Wiper Ring.....	Synthetic Rubber
Seat Disc .....	See Ordering Chart
"V"-Rings .....	Teflon
Handwheel.....	Ductile Iron
Spring.....	Stainless Steel



## Ordering Information

Part Number				Inlet and Outlet Connection	Port Diameter	Flow at 1 PSIG 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	22.0		
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	3½"	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 pressure drop, multiply flow in chart by square root of pressure drop. Example: 7514FP @ 9 PSIG = 133 x √9 = 399 GPM/propane. For NH<sub>3</sub> flow, multiple propane flow by .90.

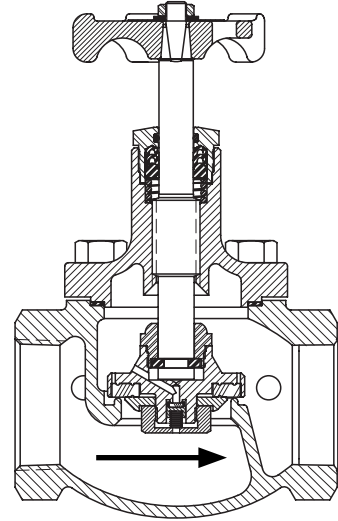
# New 2" & 3" Globe/Angle valves w/built in automatic back check HA7513AP/HA7514AP and HA7517AP/HA7518AP

## Application

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.

## Features

- V-ring spring loaded pressure stem seal provides for leak-proof operation. No packing to retighten or replace.
- Circular bridge in globe design and a dropped seat in the angle design achieve greater flow with less pressure drop.
- Swivel seat disc assembly minimizes wear which provides for good alignment and long seat life.
- ¼" F-NPT plugged holes on upstream and downstream sides of the valve.
- Heavy duty rolled ACME stem threads provide quick action and long service life.
- Seat Disc assembly incorporates an automatic back check valve, eliminating the need for a separate hydrostatic relief valve.



## Materials

Body ..... Ductile Iron  
 Stem ..... Stainless Steel  
 Seat ..... Stainless Steel  
 Seat Disc ..... Synthetic Rubber  
 Return Spring ..... Stainless Steel



## Ordering Information

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



# 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 Pamphlet #58 - 2004 Edition, "Liquefied Petroleum Gas Code" states that, "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. The 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 be furnished with a copy of NPGA Safety Pamphlet 306-88, "LP-Gas Regulator and Valve Inspection and Maintenance."

## 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 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.



### Ordering Information

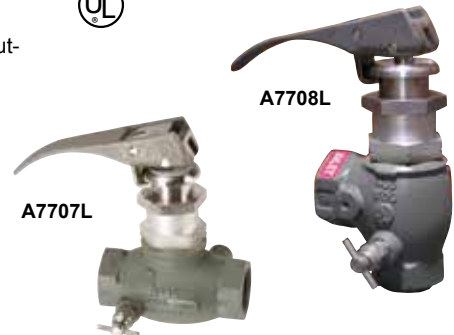
Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. ACME)	Locking Handle	Flow at 1 PSIG (Cv) Pressure Drop* (GPM/Propane)
A7793A	3/4"	1 3/4"	Yes	16.0
A7797A	1"	1 3/4"	Yes	16.0

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: A7797 @ 9 PSIG = 16.0 x  $\sqrt{9}$  = 48.0 GPM/propane. For NH<sub>3</sub> 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.



### Ordering Information

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

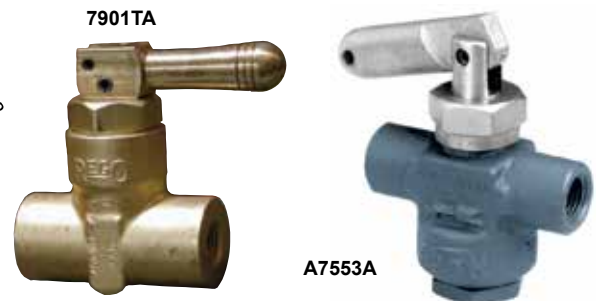
\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: A7708L @ 9 PSIG = 22.0 x  $\sqrt{9}$  = 66.0 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

\*\* See appropriate catalog section for additional information.

## Quick-Acting Valves for Cylinder Charging Hoses 7053T, A7553A, 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.



### Ordering Information

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. NPT)	Body Material	Flow At 1 PSIG (CV) Pressure Drop* (GPM/Propane)	
7901T	1/4"	1/4"	Brass	1.95	
A7553A			Ductile Iron		
7901TA	1/2"	3/8"	Brass		
7901TB					1/4"
7901TC					1/2"
7053T					

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7901T @ 9 PSIG = 1.95 x  $\sqrt{9}$  = 5.85 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

## 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.

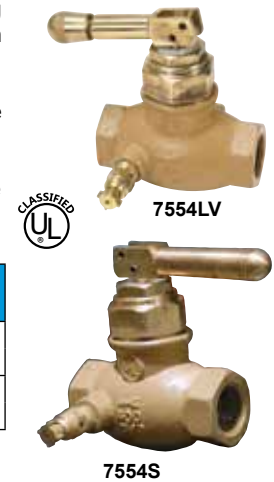
7554L Series valves feature a locking handle device to help prevent accidental opening of the valve. It is ideal for all the same applications as the 7554S Series and may be used on delivery trucks as it incorporates the locking handle design.

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.

### Ordering Information

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

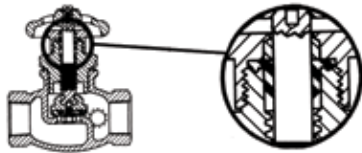
\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7554LV @ 9 PSIG = 11.5 X  $\sqrt{9}$  = 34.5 GPM/propane.



## Flange Seal Globe and Angle Valves

### 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.

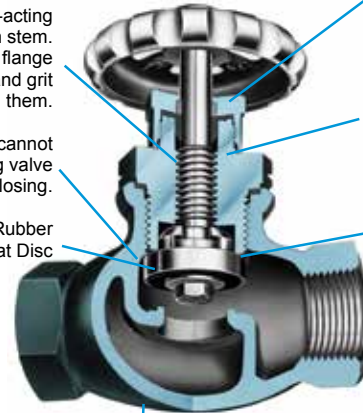
Please be familiar with the "Installation and Operation Note" and "Downstream Accessory Boss" section of the "V"-ring valve design general information before ordering these valves.

### 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 assure 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.



A7704P

A7706 P



### Ordering Information

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

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: A7704LP @ 9 PSIG = 12.3 x  $\sqrt{9}$  = 36.9 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

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

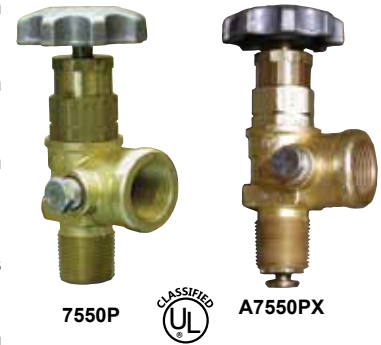
Designed especially for liquid transfer of LP-Gas from consumer bulk storage containers when used with a Chek-Lok® or equipped with an integral excess flow valve. May also be used for vapor LP-Gas service.

In NH<sub>3</sub> 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 1 1/4" x 3/4" NPT reducing coupling, the 3/4" 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.



### Ordering Information

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. NPT)	Integral Excess Flow	Flow at 1 PSIG (Cv) Pressure Drop* (GPM/Propane)	Excess Flow Approximate Closing Flow** (GPM/Propane)	Accessories	
						Hydrostatic Relief Valve	Vent Valve
7550P	3/4"	3/4"	No	13.3	-	3127U	3165
A7550P			Yes	-	16.0	SS8001J	TSS3169
7550PX		1/2"	No	8.9	-	3127U	3165
A7550PX			Yes	-	16.0	SS8001J	TSS3169

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: 7550P @ 9 PSIG = 13.3 x √9 = 39.9 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

\*\* For NH<sub>3</sub> flow, multiply propane flow by .90.

## Tank Car Angle Valves for Railroad Tank Cars TA7894P

Designed especially for transfer of LP-Gas and anhydrous ammonia in railroad tank car service.

The combined heavyweight ductile iron castings and precision machining provide ruggedness and superior performance in working pressures up to 400 PSIG.

**AAR Approval #E-049015**



### Ordering Information

Part Number	Inlet Connection	Outlet Connection (F.NPT)	Flow At 1 PSIG (Cv) Pressure Drop	Accessories	
				Hydrostatic Relief Valve	Vent Valve
TA7894P	Tank Car Flange	2"	112	SS8001U	TSS3169

\* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: TA7894P @ 9 PSIG = 112 x √9 = 336 GPM/propane. For NH<sub>3</sub> flow, multiply propane flow by .90.

## Multipurpose Valve for Filling of NH<sub>3</sub> Containers A8016DBC

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



### Ordering Information

Part Number	Inlet Connection	Filling Connection	Filling Capacity at 20 PSIG Pressure Drop GPM/NH <sub>3</sub>	Accessories	
				Hydrostatic Relief Valve	Vent Valve
A8016DBC	1 1/4"	1 1/4"	95	SS8001J	TSS3169

\* Determined at 9.5 to 12 PSIG differential.

\*\* Determined at 100 PSIG inlet.



## Multipurpose Valve for Filling of NH<sub>3</sub> 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 completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow section of this catalog.

### Ordering Information

Part Number	Inlet Connection (M. NPT)	Filling Connection (M. ACME)	Filling Capacity At 20 PSIG Pressure Drop GPM/NH <sub>3</sub>	Approximate Excess Flow Closing Flows		Accessories	
				Liquid* GPM/NH <sub>3</sub>	Vapor** CFH/NH <sub>3</sub>	Hydrostatic Relief Valve	Vent Valve
A8016DP	1 1/4"	1 1/4"	95	44	24,000	SS8001J	TSS3169

\* Determined at 9.5 to 12 PSIG differential.

\*\* Determined at 100 PSIG inlet.



A8016DP

## Multipurpose Valves for Liquid Withdrawal of LP-Gas and NH<sub>3</sub> 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.

### Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Approximate Excess Flow Liquid Closing Flow** (GPM/Propane)	Accessories	
				Hydrostatic Relief Valve	Vent Valve
A8017DH	1 1/4"	1"	49	Not Required	TSS3169
A8017DP		1"	55	SS8001J	
A8017DLP		3/4"	49		
A8020D	1 1/4"	1"	78	SS8001J	TSS3169

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

\*\* Determined at 11.5 to 13.5 PSIG differential for 3/4" outlet and 9 to 12 PSIG differential for 1" outlet. For NH<sub>3</sub> flow, multiply by .90.



A8017DP

A8020D

## Multipurpose Valve for Filling and Liquid Transfer of NH<sub>3</sub> 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.

### Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Filling Connection (M.ACME)	Filling Capacity At 20 PSIG Pressure Drop GPM/NH <sub>3</sub>	Approximate Excess Flow Liquid Closing Flow GPM/NH <sub>3</sub>	Accessories	
						Hydrostatic Relief Valve	Vent Valve
A8018DP	1 1/4"	1"	1 1/4"	74	50	SS8001J	TSS3169

\* Determined at 9 to 12 PSIG differential.

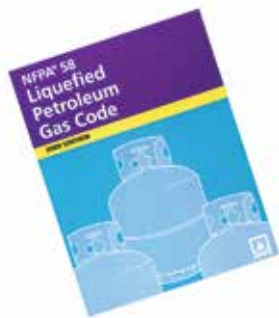


A8018DP



# LP-Gas Excess Flow 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 Pamphlet #58 - 2004 Edition Section 4.4, "Liquefied Petroleum Gas Code" states that, "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. The 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 be furnished with a copy of NPGA Safety Pamphlet 306-88, "LP-Gas Regulator and Valve Inspection and Maintenance."

## Nature of Warnings

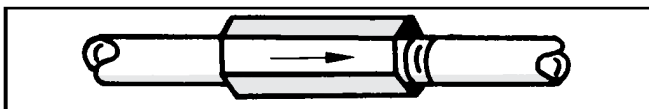
It is recognized that warnings should be as brief as possible, but the factors involved in excess flow valve failures to perform are not simple. They need to be fully understood. If there is a simple warning, it would be:

**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.

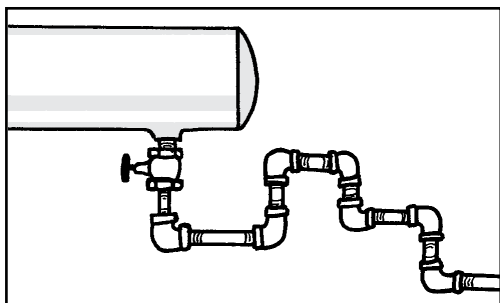
REGO® provides excess flow valves with a number of closing ratings. REGO® obviously can take no responsibility for the proper selection or correct installation of any valve.

Excess flow valves do not provide complete shut-off because there is a bleed at the check to permit pressure equalization.

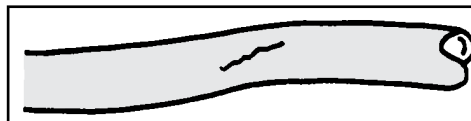
## Causes of Failure to Close

Installers, LP-Gas plant managers and service personnel should be aware that the excess flow valves may not close if these conditions are present.

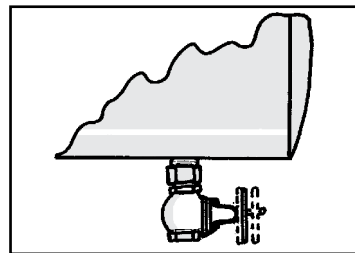
1. The piping system restrictions (due to pipe length, branches, reduction in pipe size or number of other valves) decrease the flow rate to less than the valve's closing flow.



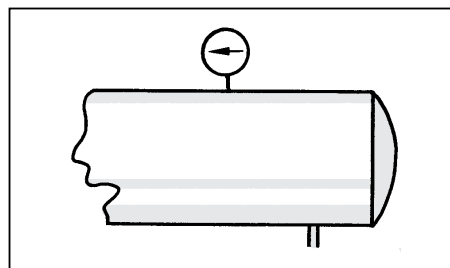
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.



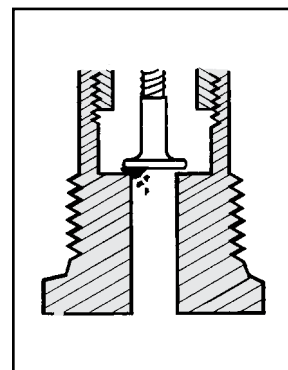
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.



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.



# LP-Gas Excess Flow Valves

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 LPGas 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. LPGas dealers should be aware of legislation which could effect them.

## 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.

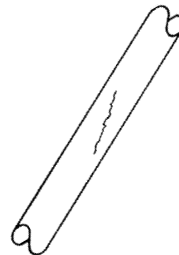
A test involving venting gas to the atmosphere is hazardous and may be impractical or illegal.

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?

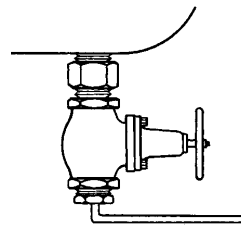
For one or a combination of the following reasons, excess flow valves have been prevented from closing in emergencies:

### 1. Not a Clean Break



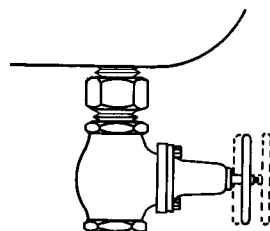
Hoses with a split or tear, and pipe lines not completely severed may be emitting LP-Gas in an amount insufficient to cause an "excess" flow. The amount of LP-Gas which can escape through such breaks may be even less than the flow during normal transfer service and under these conditions the excess flow 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.

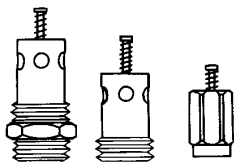
### 3. Improper Operating Practice



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.

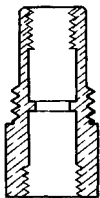
## Troubleshooting Excess Flow Valve Installations

### 4. Improper Selection



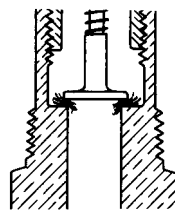
The many types of excess flow valves available are designed for specific jobs. The excess flow valve selected should remain open during normal flow but close at "excess" flow. An inspection which simulates a line break prior to start-up operations will determine if the proper valve has been selected.

### 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.

## 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 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.



## 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 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.

### Ordering Information

Part Number	Inlet Connection NPT	Outlet Connection F. NPT	Wrench Hex Flats	Effective Length (Approx.)	Threaded End to Port	Filling Connection F. NPT	Approximate Closing Flows		
							Liquid (GPM Propane)	Vapor SCFH (Propane)	
								25 PSIG Inlet	100 PSIG Inlet
1519C2	1½" Male*	1"	2¼"	2½"	2½"	1"	25	5,000	8,800
1519C4	2" Female	2"	3"	4¾"	-	2"	170	28,590	48,600



1519C4

1519C2

\* 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.

### 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"	3½"	25	5,000	8,800
A1519A2	Steel							
1519A3	Brass	1½"	1½"	2¼"	4"	60	11,500	20,200
1519A4								
A1519A4	Steel	2"	2"	3"	4¾"	100	19,000	34,500
1519B4	Brass							
A1519B4	Steel							
A1519A6		Steel						



1519A2, 1519A3, 1519A4, 1519B4, A1519A2, A1519A4, A1519B4

A1519A6

\* 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.

### Ordering Information

Part Number	Brass or Steel	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Wrench Hex Flats	Effective Length (Approx.)	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
12472	Brass	¾"	¾"	1½"	1½"	4	1,050	1,700
3272E						10	2,100	3,700
3272F						15	2,800	5,000
3272G						20	3,700	6,900
A3272G	Steel	1¼"	1¼"	2"	1½"	30	5,850	10,000
3282A	40					7,600	13,600	
3282B	50					9,000	16,300	
3282C	90					15,200	28,100	
A3282C	Steel	1½"	1½"	2¼"	1¼"	70	14,000	25,000
7574	75					14,200	24,800	
7574L	100					18,100	32,700	
3292A	Brass	2"	2"	2½"	1½"	122	22,100	37,600
A3292A						Steel		
3292B	Brass	2"	2"	2½"	1½"	100	18,100	32,700
A3292B	Steel							
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 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.

### Ordering Information

Part Number	For Use With This Type Coupling	Inlet Connection M. NPT	Outlet Connection NPT	Wrench Hex Flats	Effective Length (Approx.)	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
A8523	Half	¾"	¾" Male	1½"	1¾"	15	5,170	8,800
A8525	Half	1¼"	1¼" Male	1¾"	2½"	35	12,540	21,560
A7537L4	Half	2"	2" Male and 1¼" Female	2½"	2½"	75	13,000	25,600
A7537L4F	Full					125	25,000	42,500
A7537N4	Half					150	30,500	52,000
A7537N4F	Full					150	32,100	55,500
A7537P4	Half					200	39,400	68,300
A7537P4F	Full	3"	3" Male and 2" Female	3¾"	3½"	250	51,100	88,700
A7539R6	Half					150	32,100	55,500
A7539R6F	Full					200	39,400	68,300
A7539T6	Half					250	51,100	88,700
A7539T6F	Full					250	51,100	88,700
A7539V6	Half							
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.



## 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.

### Ordering Information

Part Number	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
A2137	2"*	2" Male and 1¼" Female	2¾"	1¼"	50	10,000	17,000
A2137A					70	14,000	25,000
2139	3"***	3" Male and 2" Female	3½"	1¼"	125	26,500	46,000
2139A					160	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

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	Inlet Connection NPT	For Installation	Effective Thread (Approx.)	Threaded End To Port	Approximate Closing Flows*		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
						25 PSIG Inlet	100 PSIG Inlet
A3500L4	2"	Slotted Body	¾"	1½"	75	13,000	22,500
A3500N4					125	25,000	42,500
A3500P4					150	30,500	52,000
A3500R6	3"		1"	1¼"	150	32,100	55,500
A3500T6					200	39,400	68,300
A3500V6					250	51,100	88,700
A4500Y8	4"		1½"	1½"	500	89,000	154,000

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.

### Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection NPT	Wrench Hex Flats	Effective Length (Approx.)	Threaded End To Port	Approximate Closing Flow**		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
A8013D	1 1/4"	3/4"	1 7/8"	9/16"	-	39	8,700	14,700
A8013DA		1"		2 1/32"				
A8013DB		1 1/4"		1 1/16"				
2723C	1 1/4"	3/4"	1 1/16"	1 1/4"	3 3/16"	20	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.



2723C

A8013D

## 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.

### Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Wrench Hex Flats	Effective Length (Approx.)	Threaded End To Port	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
2884D	3/4"	1/4"	1 1/8"	1 1/4"	1 1/8"	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.



2884D

## 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.

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Wrench Hex Flats	Effective Length (Approx.)	Approximate Closing Flow*		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
						25 PSIG Inlet	100 PSIG Inlet
3199W	Male POL	1/4"	7/8"	1 1/16"	.95	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.



3199W

## 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 unthread from the tank during removal. When necessary, use a second wrench to secure the Chek-Lok in position.

- 2 Before beginning withdrawal, securely connect an 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. 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 or more.

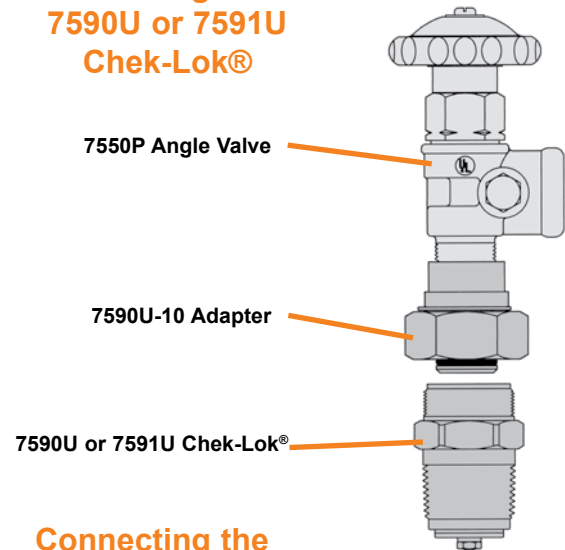
If, for any reason, the excess flow valve does not close, the shut-off valve must be closed immediately and must not be removed until the system can be evacuated and the unit repaired.

- 3 After the excess flow valve closes, remove the Adapter and Shut-Off Valve Assembly.

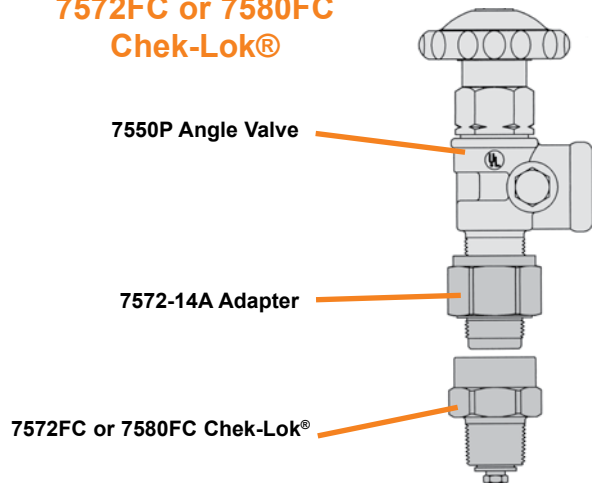
- 4 Clean face of Chek-Lok and install the Cap with a gasket. IMPORTANT: Only use the proper Chek-Lok Cap. Do not use a standard pipe cap.

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®

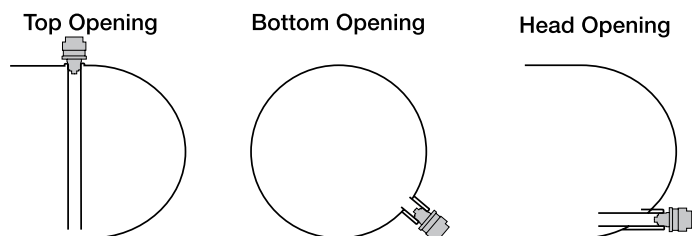


In the absence of a 7550P transfer valve, a 3/4" A7505A Globe Valve or A7506AP Angle Valve may be used. Follow the above procedures using the 7572C-15A adapter instead of the 7572C-14A. Use a REGO® 7550P without an adapter in an emergency only.

**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® 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.



7590U with Cap

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.

Chek-Lok® Number	Inlet Connection	Outlet Connection	Body Wrench Hex Flats	Approximate Effective Length	Cap Wrench Hex Flats	Approximate Closing Flow, Liquid GPM (Propane)*
7590U	¾" M. NPT	1½" UNF	1½"	1¼"	1½"	20
7591U	1¼" M. NPT	1½" UNF	1¾"	1¼"		35

\* 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® 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" F. NPT	¾" F. NPT	1¾" F. NPT	4½" F. NPT

## 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	1¾"	3¾"

## 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.

### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Length
7590U-10	1½" UNF	¾" F. NPT	1¾"	1¼"



7590U-10

## 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.

### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Effective Length
7572C-14A	¾" M. NPT	¾" F. NPT	1¾"	1"
7572C-15A		¾" M. NPT		¼"



7572C-15A  
For Globe and  
Angle Valves



7572C-14A  
For Transfer  
Valves

## Double-Check Filler Valves

### General Information

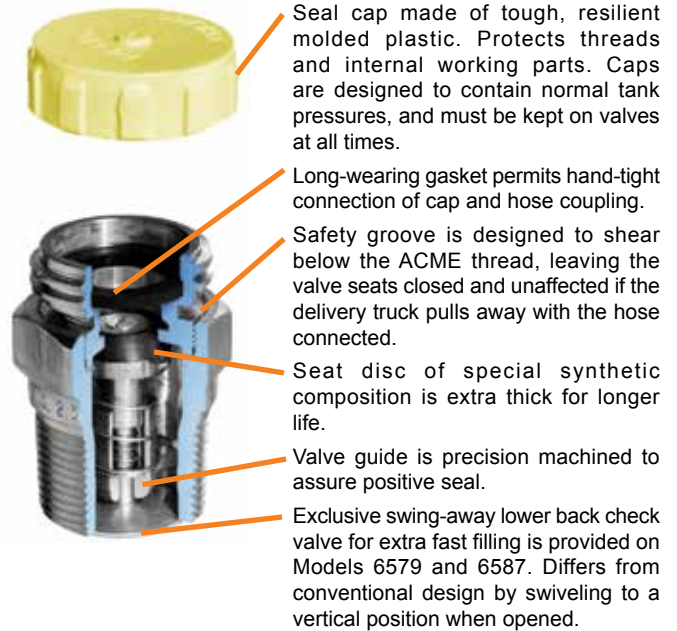
RegO® Double-Check Filler Valves incorporate a resilient upper check valve, normally designated as a filler valve, and a lower check valve, commonly called a back pressure check valve. Available in a range of sizes to cover virtually all LP-Gas storage containers, these valves are UL listed and meet 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 Forklift, Motor Fuel and RV Tanks 7647 Series

Designed to provide fast filling of forklift, motor fuel, and recreational vehicle tanks.



7647DC



Lanyard and Cap

7647SC

### Ordering Information

Part Number	Hose Connection	Tank Connection M. NPT	Wrench Flats	Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)*				
					10 PSIG	20 PSIG	30 PSIG	40 PSIG	50 PSIG
7647DC	1¾" ACME & F. POL	¾"	1½"	3"	14	20	24	27	50
7647SC*			1¾"	2¼"					

\* Multiply flow rate by .94 to determine liquid butane capacity.



## Double-Check Filler Valves for Large Motor Fuel and ASME Tanks 6579 Series and 7579 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.



### Ordering Information

Part Number		ACME Hose Connection	Tank Connection M. NPT	Wrench Hex Flats	Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)				
Cap Only	Cap, Chain and Ring					5 PSIG	10 PSIG	25 PSIG	50 PSIG	75 PSIG
L7579	L7579C	1 1/4"	1 1/4"	1 1/8"		50	70	111	157	192
7579P	-		1 1/4"			37	52	82	116	142
6579**	6579C**		1 1/4"			78	110	174	246	301

\* Incorporates 3/4 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.



## 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	ACME Hose Connection	Tank Connection M. NPT	Wrench Hex Flats	Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)				
					5 PSIG	10 PSIG	25 PSIG	50 PSIG	75 PSIG
7579S	1 1/4"	1 1/2"	2"	2 1/16"	44	62	98	139	170
6587EC*	2 1/4"	2"	2 7/8"	4 3/8"	92	130	206	291	356
3197C	3 1/4"	3"	4"	6 1/2"	148	210	332	470	575

\* 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)				For Use With Back Check Valve:
				5 PSIG	10 PSIG	25 PSIG	50 PSIG	
3174C	1 1/4"	1 1/4"	1 1/4"	23	33	52	74	3176
6584C*	2 1/4"	2"	2 7/8"	156	220	348	492	A3186
3194C	3 1/4"	3"	3 1/2"	147	208	329	465	A3196

\* Stem Assembly designed for higher filling rates.

NOTE: Multiply flow rate by .94 to determine liquid butane capacity.



## Vapor Equalizing Valves

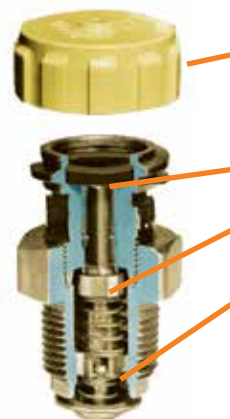
### General Information

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.

### Spare Gasket Ordering Information

ACME	Part Number
1¼"	A2797-20R
1¾"	A2697-20R



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 assure positive seal.

### Spare Gasket Ordering Information

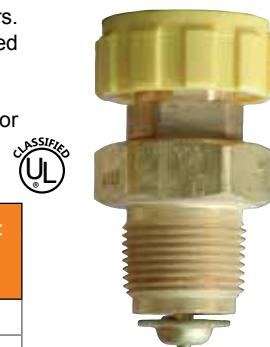
## Double Check Vapor Equalizing Valves for ASME and DOT Containers 7573 Series and 3183AC

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.

### Ordering Information

Part Number		ACME Hose Connection	Tank Connection M. NPT	Wrench Hex Flats	Effective Length (Approx.)	Approx. Closing Flow at 100 PSIG Inlet Pressure (SCFH/Propane)
Basic	W/ Chain & Cap					
7573D	7573DC	1¼"	¾"	1¼"	2⅛"	4,100
-	3183AC	1¾"	1¼"	2"	3⅛"	10,000



7573 Series

## 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.

### Ordering Information

Part Number		Inlet Connection	Outlet Connection	Wrench Hex Flats	Effective Length (Approx.)	Approximate Closing Flow at 100 PSIG Inlet Pressure (SCFH/Propane Vapor)	For Use With Excess Flow Valve:
Basic	With Cap & Chain						
3170	-	1¼"	¾"	1¼"	1⅞"	7,600	3272E
-	3180C	1¾"	1¼"	1¾"	1⅞"	10,000	3282A



3170

## Back Pressure Check Valves

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.

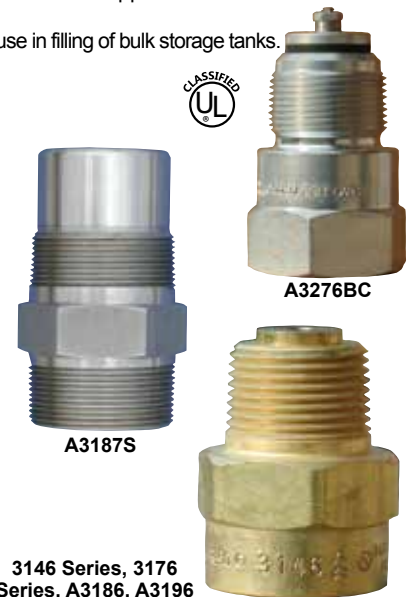
When used with the appropriate single check filler valve, the combination forms a double check filler valve suitable for use in filling of bulk storage tanks.

### Ordering Information

Part Number		Inlet Connection F. NPT	Outlet Connection M. NPT	Wrench Hex Flats	Effective Length (approx.)	Propane Liquid Capacity at various differential pressures (GPM)			
Brass	Steel					5 PSIG	10 PSIG	25 PSIG	50 PSIG
3146	A3146	3/4"	3/4"	1 3/8"	1 15/16"	11	16	25	36
3146S*									
3176	A3176	1 1/4"	1 1/4"	2"	1 3/8"	28	40	63	89
	A3276BC*				2 1/2"	32	45	73	103
	A3186			2 7/8"	124	175	276	391	
	A3187S*	2" M & 1 1/4" F	2" M & 1 1/4" F	2 3/8"	4 3/8"	60	110	225	350
	A3196	3"	3"	4"	3 15/16"	297	420	664	939
	A3198S*	3" M & 2" F	3" M & 2" F	3 1/2"	3 1/8"	210	290	400	

\*Soft seat version.

NOTE: Multiply flow rate by .94 to determine liquid butane capacity and by .90 to determine liquid anhydrous ammonia capacity.



A3276BC

A3187S

3146 Series, 3176 Series, A3186, A3196

## 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.

### Ordering Information

Part Number		Inlet Connection F. NPT	Outlet Connection M. NPT	Wrench Hex Flats	Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)			
Brass	Steel					5 PSIG	10 PSIG	25 PSIG	50 PSIG
6586D	A6586D	2"	2"	2 7/8"	2 1/16"	190	270	420	600

NOTE: Multiply flow rate by .94 to determine liquid butane capacity.



6586D

## Back Pressure Check Valves for Flanged Installation A3400L4 & 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 assure ample capacity for the most demanding high capacity filling operations.

The valve is designed for installation in internally threaded flanges in container bottoms.

### Ordering Information

Part Number	Flange Connection M. NPT	Wrench Hex Flats	Overall Length	Threaded End To Port	Propane Liquid Capacity at Various Differential Pressures (GPM)			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A3400L4	2"	Slotted	5 1/4"	1 1/16"	223	316	500	707
A3400L6	3"		5 3/2"	1 1/16"	424	600	949	1342

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.



A3400L6

# 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 Pamphlet #58 - 2004 Edition Section 4.4 "Liquefied Petroleum Gas Code" states that "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. The 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 be furnished with a copy of NPGA Safety Pamphlet 306-88 "LPGas Regulator and Valve Inspection and Maintenance, 111-81 Limitations of Excess Flow Check Valves for LP-Gas, and 113-78 Safety Considerations in Bobtail Deliveries."

## 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

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 insure 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 insure 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 to open and 8 psi 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 insure the internal valve will give a gas tight seal when the valve is in the closed position. First insure 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.

## Maintenance

Potential problems may be eliminated with preventive internal valve maintenance. Perform the following steps once a month:

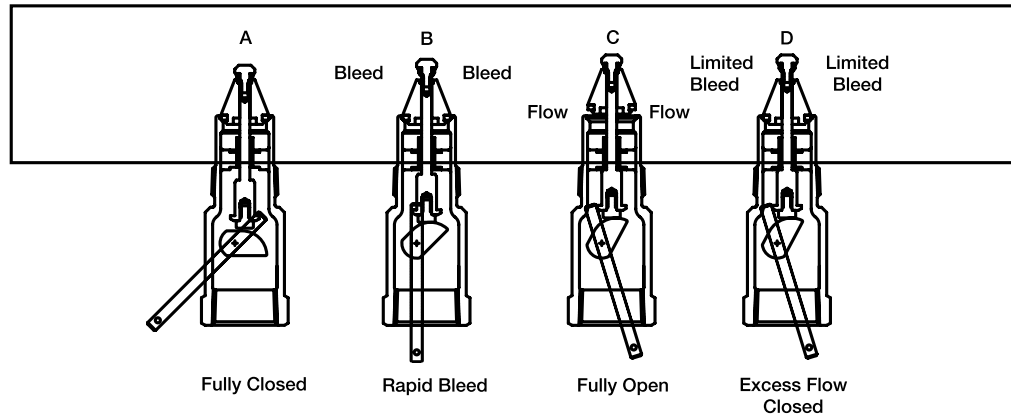
1. Check to see that the operating lever moves freely and smoothly. There should be no leakage around the lower stem or seal housing. Leakage requires replacement of the seal housing packing. A sticking lever indicates trapped foreign material or mechanism wear.

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.

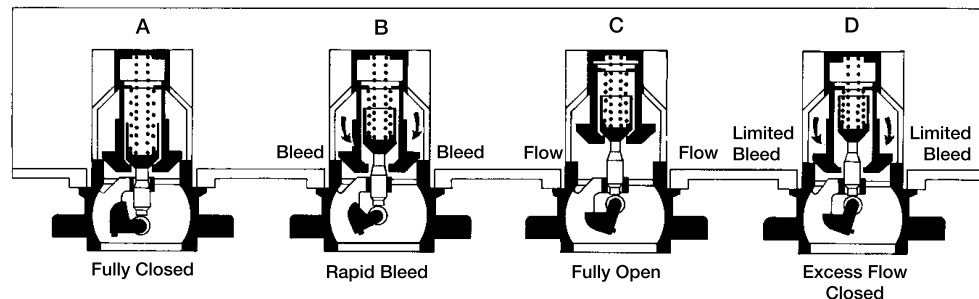
3. Inspect, clean and oil all operating controls. Check controls to see that they open fully, but do not overtravel the valve operating lever. See that they work freely to close the valve. Worn parts should be replaced.

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  
 A3212RT Series 2" Tee Body  
 A3213R Series, 3" Straight  
 A3213T Series 3" Tee Body



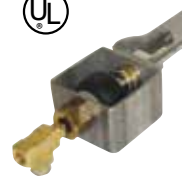
A3219FA Series, 4" Flanged

## 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, NH<sub>3</sub> 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.

### Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow		LP-Gas Vapor Capacity** (SCFH/Propane)		Accessories	
			LP-Gas	NH <sub>3</sub>	25 PSIG	100 PSIG	Thermal Latch	Pneumatic Actuators
A3209D050	1¼"	1¼"	50	45	13,300	22,900	A3209TL	A3209PA A3209PAF
A3209D080	1¼"	1¼"	80	72	15,700	26,700		
A3209DT050	1¼"	1¼"	50	45	13,300	22,900		
A3209DT080	1¼"	1¼"	80	72	15,700	26,700		



A3209PAF



A3209D



A3209DT

## Product Update New 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.



### Ordering Information

Part Number	Inlet M-NPT	Outlet F-NPT	Closing Flow GPM				LP-Gas Vapor Capacity (SCFH/Propane)		Accessories	
			Half Coupling		Full Coupling		25 PSIG Inlet	100 PSIG Inlet	Thermal Latch	Pneumatic Actuator
			LP-Gas	NH <sub>3</sub>	LP-Gas	NH <sub>3</sub>				
A3211D080	1½"	1½"	80	72	63	67	15,700	26,700	A3209TL	A3209PAF A3209PA
A3211D110	1½"	1½"	110	99	84	76	N/A	N/A		

A3211D

## 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.



A3217A and Pneumatic Actuators

### Ordering Information

Part Number	Operating Lever Position	Inlet Connection	Outlet Connection	Closing Flow GPM		Accessories		
				LP-Gas	NH <sub>3</sub>	Pneumatic Actuator		
						Right Operation	Left Operation	
<b>Single Flange</b>								
A3217AR160	A3217AL160	Left or Right	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	160	145	A3217ARPA A3217RA	A3217ALPA A3217LA
A3217AR210	A3217AL210				210	190		
A3217AR260	A3217AL260				260	236		
A3217AR410	A3217AL410				410	372		
A3217AR510	A3217AL510				510	459		
<b>Double Flange</b>								
A3217DAR160	A3217DAL160	Left or Right	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	160	145	A3217ARPA A3217RA	A3217ALPA A3217LA
A3217DAR210	A3217DAL210				210	190		
A3217DAR260	A3217DAL260				260	236		
A3217DAR410	A3217DAL410				410	372		
A3217DAR510	A3217DAL510				510	459		

## 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.

### Ordering Information

Part Number*	Inlet Connection	Outlet Connection	Closing Flow GPM		Accessories	
			LP-Gas	NH <sub>3</sub>	Pneumatic Actuator	Remote Thermal Release
A3219FA400L	4" 300# ANSI RF Modified Flange**	4" 300# ANSI RF Flange	400	360	A3219FPA A3219RA	A3219RT (2)
A3219FA600L			600	540		

\* Valve supplied with 16 nuts and 8 studs for mounting.

\*\* Modified bore = 5 7/8" diameter with 7" diameter raised face.



A3217RA



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 NH<sub>3</sub> transport trailers and stationary tanks.



## 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.

### 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



## 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.

### 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



## Threaded Internal Valves For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks A3213R 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.

### Ordering Information

Part Number	Inlet Connection M-NPT	Outlet Connections F-NPT	Closing Flow Half Coupling (GPM)		Closing Flow Full Coupling (GPM)		LP-Gas Vapor Capacity (SCFH/Propane)		Accessories		
			LPG	NH <sub>3</sub>	LPG	NH <sub>3</sub>	25 PSIG Inlet	100 PSIG Inlet	Pneumatic Actuator	Rotary Actuator	Thermal Latch
A3213R150	3"	3"	150	135	125	113	-	-	A3213PA	A3213RA	A3213TL
A3213RT150		3" T-body	150	135	125	113	-	-			
A3213R200		3"	200	180	160	144	44,100	75,100			
A3213RT200		3" T-body	200	180	160	144	44,100	75,100			
A3213R300		3"	300	270	250	225	57,900	90,500			
A3213RT300		3" T-body	300	270	250	225	57,900	90,500			
A3213R400		3"	400	360	325	293	71,400	121,300			
A3213RT400		3" T-body	400	360	325	293	71,400	121,300			



## 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.

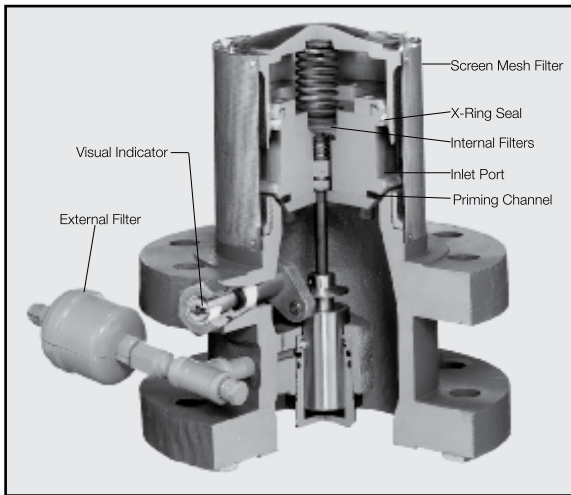
### Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow (GPM) Half Coupling		Closing Flow (GPM) Full Coupling		Accessories		
			LP-Gas	NH <sub>3</sub>	LP-Gas	NH <sub>3</sub>	Thermal Latch	Pneumatic Actuator	Rotary Actuator
A3212R105	2"	2"	105	95	65	59	A3213TL	A3213PA	A3212RA
A3212RT105		2" T-body							
A3212R175		2"							
A3212RT175		2" T-body							
A3212R250		2"							
A3212RT250		2" T-body							





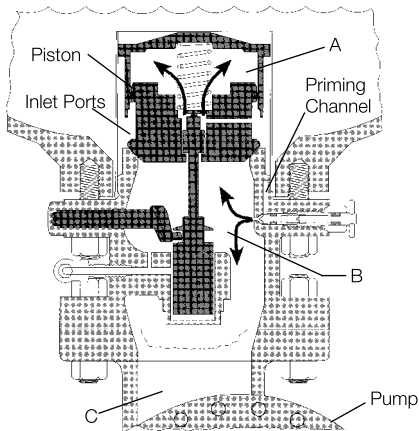
# Flomatic® Internal Valve Operation



## 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.

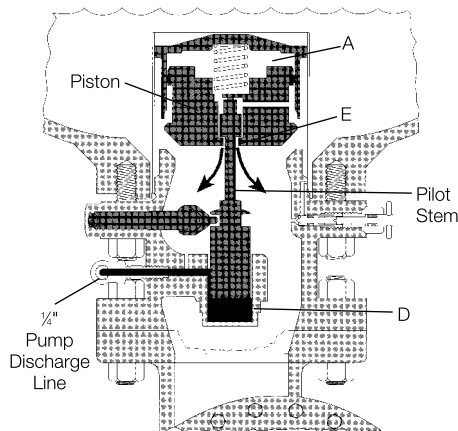
1



## 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

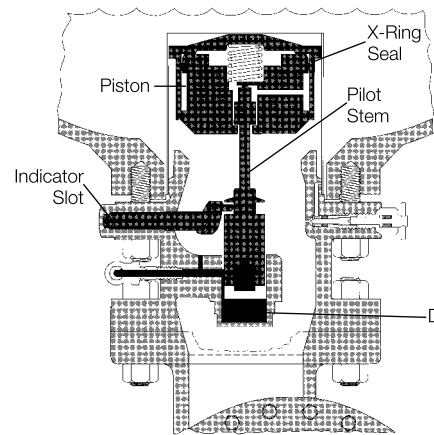
RegO® piston type Flomatic® Internal Valves are normally closed and use pressure differential to provide completely automatic service. Mounted directly between the tank body and pump, the Flomatic® uses the pressure differential developed by the pump to open the valve and it closes automatically when 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 pump differential pressure is required to open the valve; approximately 8 psig differential pressure will hold the valve open.

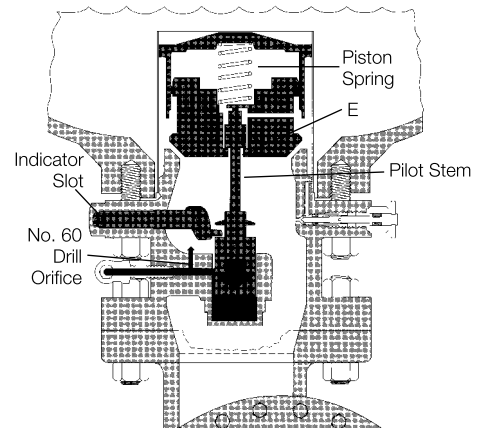
3



## 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





# Flomatic® Internal Valves for Bobtail Delivery Trucks, Transports and Large Stationary Storage Tanks A7883FK and A7884FK

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.

## 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"	10⅞"	4⅜"	A7884-201	A7853A
A7884FK	4"-300#***	4"-300#	5¾"	10"	11¼"	4⅜"		

\*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.  
 \*\*With 4⅜" diameter bore.  
 \*\*\*With 5⅜" diameter bore.



A7883FK

# ¼" Three-Way Quick-Acting Valve A7853A

## Ordering Information

Part Number	Flange Type	Accessories	
		Pneumatic Actuator	3-Way Valve
A7883FK	T-1 Steel Carbon Steel	A7853PAF	A7853PA
A7884FK			

\*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.  
 \*\*With 4⅜" diameter bore.  
 \*\*\*With 5⅜" diameter bore.



A7853A ¼" Three-Way Quick-Acting Valve

# 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 assure 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.

## Ordering Information

Part Number	Type of Service	Hose Connection (M. NPT)	Coupling Connection (F. ACME)	Approx. Length
A7575L2*	Liquid	½"	1¾"	7"
A7575L3		¾"		
A7575L4		1"		
A7575L5**		1¼"		
A7571LA	Vapor	½"	1¼"	
A7571LB		¾"		

\* Includes 7199-33 adapter, shipped loose.  
 \*\* Includes A7575L5-1 adapter, shipped loose.



A7575 Series

A7571 Series

# Short Type Hose Couplings for Vapor and Liquid Service 3171, 3175, 3181, 3185 and 3195 Series

## Ordering Information

Part Number	Material	Style	Hose Connection (M. NPT)	Coupling Connection (F. ACME)	Tailpiece Bore	Hose End To Nut	Overall Length		
3175B	Brass	A	½"	1¾"	39/64"	2"	2⅞"		
3175			¾"		¾"				
3175A			1"						
3185			1¼"		2¼"			13/16"	2½"
3195	Brass Nut & Steel Nipple	B	2"	3¾"	11/16"	2½"	3⅞"		
*3195S									
A3175	Steel	A	¾"	1¾"	¾"	2"	2⅞"		
A3175A			1"						
A3185		B	1¼"	2¼"	13/16"	2½"	3⅞"		
A3195			2"	3¾"	11/16"	2½"	3⅞"		
*A3195S									
3171	Brass	C	3/8"	1¼"	13/32"	1⅜"	2⅞"		
3171A			½"		17/32"				
3181			¾"		11/16"			2"	3¼"
3181A			1"		15/16"			1⅞"	3⅞"
3191			1¼"		2¼"			3/16"	2⅞"

\* Equipped with screen.



3171A Series

A3185 Series

3191 Series

3175 Series

## 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.

### Ordering Information

Part Number	Application	Inlet	Outlet	Protective Cap*	
				Rubber	Brass
7141M	Service Valve	3/8" F. NPT	1/4" M. ACME	7141M-40	7141FP
7141F	Fuel Line	1/4" F. ACME	1/4" F. NPT	-	-

\* Recommended to minimize foreign material entering valves which could result in leakage.



7141M



7141F

## Unloading Adapters for Container Evacuation 3119A and 3120

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.

### Ordering Information

Part Number	Style	A. Filler Valve Connection	B. Hose Connection
3119A	In-Line	1 3/4" F. ACME	1 3/4" M. ACME
3120	Angle		3/4" F. NPT
3121			



3120



3119A



3121

## Vapor Equalizing Adapter for 1 1/4" ACME Vapor Equalizing Valves

The 7573-20 is designed for use with RegO Multivalves® that utilize a vapor equalizing port and 7573 series vapor equalizing valves. The adapter's operating handle opens and closes the upper check stem in the vapor equalizing valve after the ACME connection is completely made up. This adapter is designed to eliminate the need for gas flow from the vapor equalizing valve whenever the adapter is installed or removed. A shutoff valve, such as a full port ball valve or globe valve must be installed before the 7573-20 adapter to stop gas flow when the adapter is not connected.

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Approximate Length	Approximate Width
7573-20	1 1/4" F. ACME	3/4" M-NPT	4 7/16"	2 3/8"

7573-20



## Filler Hose Adapters 3179B and 7577V

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.

### Ordering Information

Part Number	Built-in Vent Valve	Filler Valve Connection	Hose Connection
7577V	Yes	1 1/4" F. ACME	1 1/4" M. ACME
3179B	No		
7576	Yes		



7576



3179B



7577V



## 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.

### Ordering Information

Part Number	Material	Connection
N970P	Cyclac	M. POL (CGA 510)
10538P	Brass	
3705RC		



10538P

(Has hole for attaching wire to prevent loss of plug)



N970P

## ACME Plugs

Specifically designed to withstand the everyday abuse given 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.

## Ordering Information

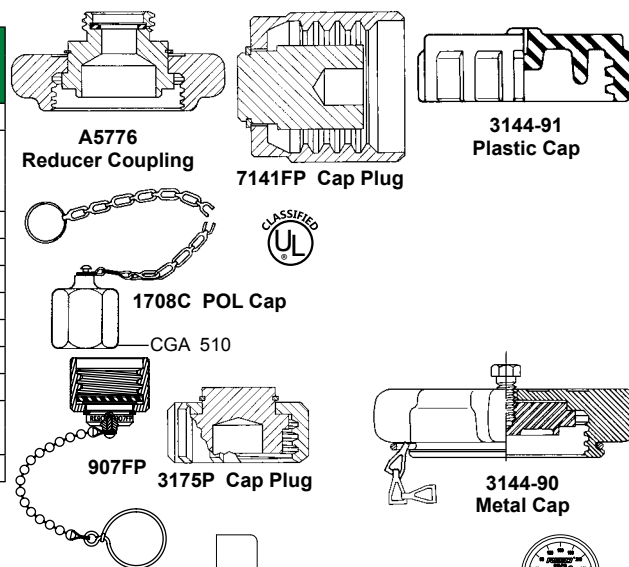
Part Number	Material	A (M. ACME)	Chain & Ring Fits Pipe Size Up To:
C5763N	Nylon	1 1/4"	3/4"
C5765N		1 1/4"	1 1/4"
5765PR	Brass		Not Applicable
C5767N	Nylon	2 1/4"	1 1/4"
C5769N		3 1/4"	2"



## 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	3/4"	3144-9P	Cyclac	1 1/4" F. ACME
3174-91		3174-9P		1 1/4" F. ACME
3174-93		A8016-9P		Nylon
A8016-93	1 1/4"		Brass	F. POL (CGA 510)
1708				1 1/4" F. ACME
7141FP				1 1/4" F. ACME
3175P				2 1/4" F. ACME
3184-90				3 1/4" F. ACME
3194-90	2"	5776*	Steel	2 1/4" F. ACME
-				3 1/4" F. ACME
-	3"		Steel	2 1/4" F. ACME
A3184-90				3 1/4" F. ACME
A3194-90	3"		Steel	3 1/4" F. ACME
-				
907FP	1"		Brass	1 15/16" F. ACME



\* Reduces to 1 1/4" M. ACME

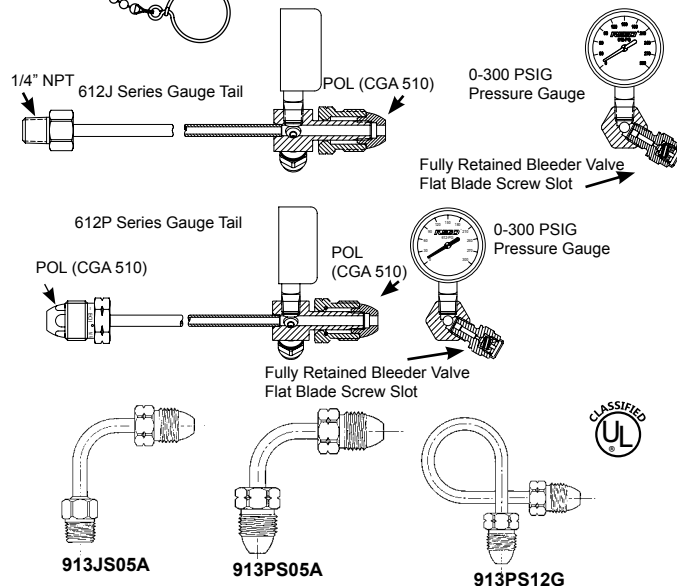
## Copper Pigtails



912JS12  
Straight Pigtails

### Ordering Information

Connections	Approximate Length	Part Number		
		7/8" Hex Short Nipple	1 1/8" Hex Long Nipple	3/8" Tube 7/8" Hex Short Nipple
M.POL x M.POL	5"	-	1/2"	913JS05
	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	-	-
	20"	912JS20	-	-
	36"	912JS36	-	-
1/2" M.NPT x M.POL	12"	-	-	913LS12
1/2" M.NPT x 3/8" M.POL	12"	-	-	913KL12



### Ordering Information Bent Pigtails

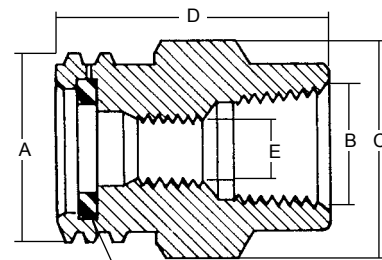
Connections	Approximate Length	Part Number		Type/Degree of Bend
		3/8" Tube	7/8" Hex Short Nipple	
1/4" M. NPT x M. POL	5"	913JS05A		90°
		913PS05A		
M. POL x M. POL	12"	913PS12G		270° Right Hand
		913PS12H		270° Left Hand
		913PS12S		360°

# ACME Adapters

## Ordering Information

Part Number	Material	A M. ACME	B F.NPT	C Hex	D Overall Length	E Diameter	For Spare Gasket Order Part No.
5764A	Brass	1 1/4"	1/4"	1 3/4"	1 1/2"	3/4"	A2697-20R
5764B			3/8"				
5764C			1/2"				
5764D			3/4"				
5764E			1"				
5766E			2 1/4"		1"		
5766F	1 1/4"						
*5768G	3 1/4"	3 1/4"	1 1/2"	3 1/2"	3 5/8"	2 1/8"	A3194-8R
*5768H			2"				
A5764D	Steel	1 3/4"	3/4"	1 3/4"	2"	3/4"	A2697-20R
A5764E			1"				
*A5768H			3 1/4"				

\*Screen Included



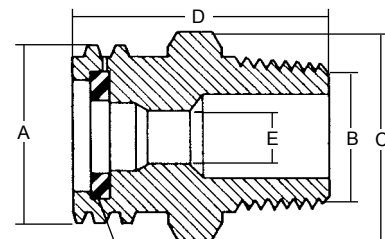
Gasket (Furnished with adapter)

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	1 1/4"	3/4"	1 1/4"	1 3/4"	7/16"	A2797-20R
5765D			3/4"		1 1/2"	1 1/16"	
5765E		1 3/4"	1"	1 3/4"	2 1/8"	3/4"	A2697-20R
5765F			1 1/4"				
5767F		2 1/4"	1 1/4"	2 1/4"	2 5/16"	1 3/16"	A3184-8R
5767G			1 1/2"			1 3/8"	
5767H		3 1/4"	2"	3 3/8"	2 7/16"	1 25/64"	A3194-8R
*5769H			2"			1 1/8"	
*5769K	3"		2 1/8"				
A5765C	Steel	1 3/4"	1/2"	1 3/4"	2 3/16"	1 7/32"	A2697-20R
A5765D			3/4"			1 1/16"	
A5765E			1"			7/8"	
A5765F			1 1/4"			1 5/16"	
A5767F		2 1/4"	1 1/4"	2 1/4"	2 3/8"	1 3/16"	A3184-8R
*A5769H	3 1/4"	3"	3 1/4"	3 13/16"	2 7/8"	1 7/8"	A3194-8R
*A5769K					2 1/8"		

\*Screen Included

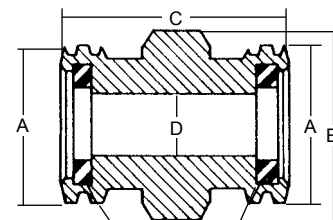


Gasket (Furnished with adapter)

ACME x Male NPT

## Ordering Information

Part Number	Material	A M. ACME	B Hex	C	D Diameter	For Spare Gasket Order Part No.
5765M	Brass	1 1/4"	1 1/4"	2 1/16"	7/8"	A2697-20R
5767M		2 1/4"	2 1/4"	2 5/16"	1 25/64"	A3184-8R
5769M		3 1/4"	3 1/4"	2 3/4"	2 1/8"	A3194-8R



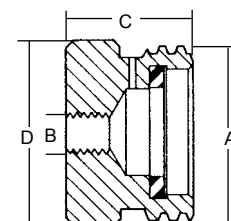
Gasket (Furnished with adapter)

ACME x ACME

## Ordering Information

Part Number	Material	A M. ACME	B F. NPT	C Hex	D Diameter	For Spare Gasket Order Part No.
A5764W	Steel	1 3/4"	3/8"*	1 1/4"	1 11/16"	2697-20
5764W	Brass					

\* 3/8" -16 UNC Thread.



ACME x Miscellaneous  
(Recommended for securing hose-end valve when not in use).

## 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.

### Ordering Information

Part Number	Style	Gasket Qty	Vent Valve	Hex Size	Thread	Length
5769H	1	1	-	3 1/4"	2" NPTF	2.875
5769K	1	1		3 1/2"	3" NPTF	3.625
5769M	2	2	3165CBT	3 1/4"	3 1/4" ACME	2.750
5769HVB	1	1			2" NPTF	3.150
5769HVSS	1	1			TSS3169	3.150



5769HVB

## 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.

### Ordering Information

Part Number	ACME Connection	Outlet Connection M.NPT	Wrench Flats	Hydrostatic Relief Valve	Propane Capacity at Various Differential Pressures (GPM)		
					5 PSIG	10 PSIG	25 PSIG
6588LE	3 1/4"	2"	3"	3125L	138	223	349
6589LE	3 1/4"	3"	3 1/4"	3125L			

6588 Series



## 3 1/4" ACME Caps with Cable Lanyard and Nameplates 3194 Series

### Application

The 3 1/4" ACME cap features a name plate signifying liquid, vapor, or spray fill. In addition this ACME cap is fitted with a cable lanyard crimped and installed on the cap. The other end is not crimped and can be cut to a custom length. Available in brass or steel.



### Ordering Information

Cap with Label/Lanyard		Material	Connection
Part Number	Marked on Cap		
3194-91L	Liquid	Brass	3 1/4" F.ACME
3194-91S	Spray Fill		
3194-91V	Vapor		
A3194-91L	Liquid	Steel	3 1/4" F.ACME
A3194-91S	Spray Fill		
A3194-91V	Vapor		

\*Note the 3194-11ALS are printed spray fill and liquid on the opposite sides of the same name plate

## 3 3/4" ACME Cap with Stainless Steel Flange

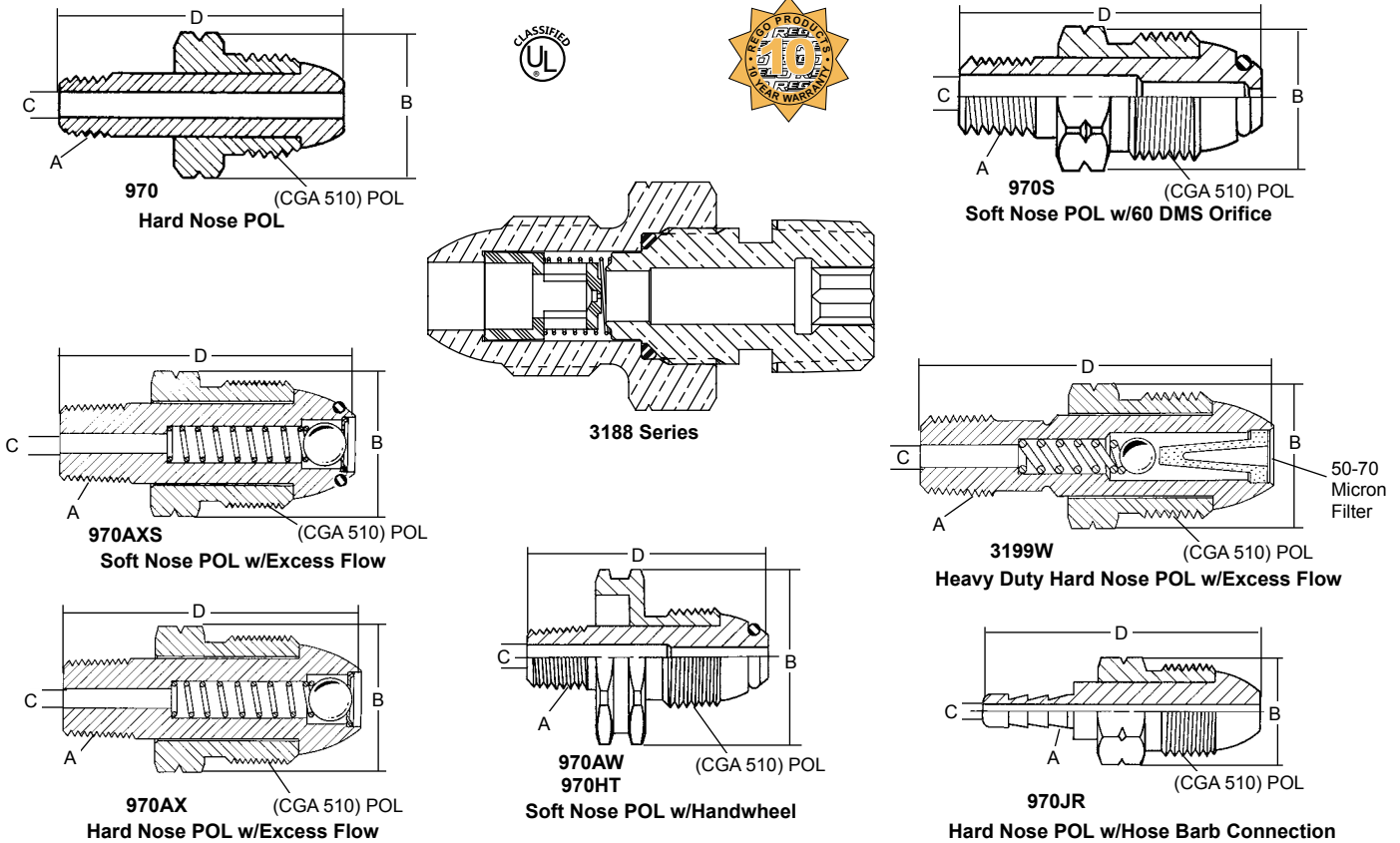
### Ordering Information

Part Number	ACME Connection	Connector	Marking	Material
3194-90G	3 1/4"	Chain	-	Brass
3194-90GS	3 1/4"	Cable	Spray Fill	





# Male POL Swivel Adapters



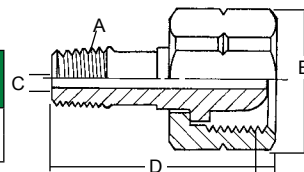
## Ordering Information

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	7/8"	5/16"	2 3/8"	-	-		
970S				3/16"	2 3/32"				
970AX				5/16"	2 5/64"			404	1.10
970AXS			1 3/8"	2 7/16"	450			0.95	
3199W				3/16"	2 3/32"			-	-
970AW				5/32"	2 5/8"				
970HT		5/32"	2 5/8"						
970JR		1/4" Hose Barb	7/8"	5/32"	2 5/8"	-	-		
3188A		1/2" M. NPT	1 1/8"	5/16"	2 1/2"	350	.95		
3188B						700	1.9		
3188C	1180					2.9			

Note: All nipples incorporate wrench hex section.

# CGA 555 Swivel Adapters

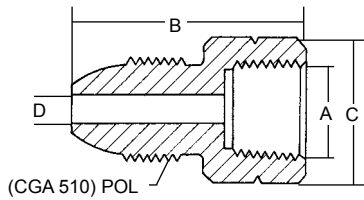
Part Number	Material	A Outlet Thread	B Hex	C Drill	D Overall Length
12982	Brass	1/4" M. NPT	1 1/4"	3/16"	1 15/16"
12982G		3/16" -18NF			



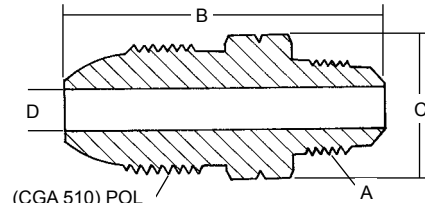
CGA 555



# POL Adapters



Male POL x Female NPT



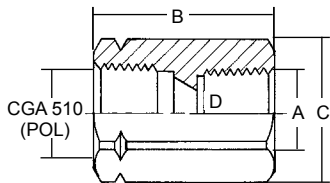
Male POL x Male NPT and SAE Flare

## Ordering Information

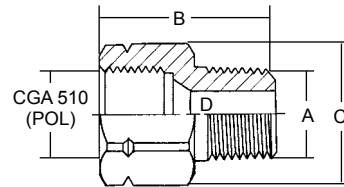
Part Number	Material	A M. ACME	B	C Hex	D Diameter
2906A	Brass	1/4"	1 1/8"	1 5/16"	1/4"
2906G		1/2"	2"	1 1/8"	

## Ordering Information

Part Number	Material	A	B	C Hex	D Diameter
2906D	Brass	3/8" M. NPT	2 1/16"	1 5/16"	1 1/32"
2906F		3/8" SAE Flare			
2906E		1/2" SAE Flare	2 1/4"	7/8"	9/32"



Female POL x Female NPT and Female POL



Female POL x Male NPT

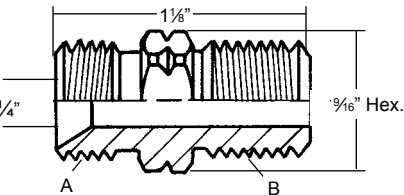
## Ordering Information

Part Number	Material	A	B	C Hex	D Diameter
5760Z	Brass	1/8"	1 5/8"	1 1/8"	5/16"
5760A		1/4"			13/32"
5760B		3/8"			35/64"
5760C		1/2"			43/64"
5760D		3/4"			13/32"
5760S	POL (CGA 510)	2 1/8"	1 1/8"		

## Ordering Information

Part Number	Material	A	B	C Hex	D Diameter
5761A	Brass	1/4"	1 5/8"	1 1/8"	3/16"
5761B		3/8"			13/32"
5761C		1/2"			7/16"
5761D		3/4"			

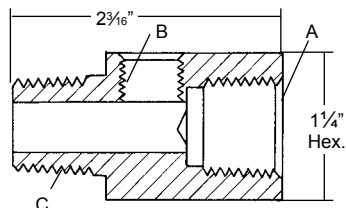
**Hose Adapter**  
For use with fuel gases (LP-Gas, Acetylene).



## Ordering Information

Part Number	Material	A	B
1300	Brass	9/16" - 18NF (L.H.)	1/4" M. NPT

**Pressure Gauge Adapter**

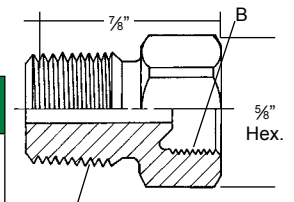


## Ordering Information

Part Number	Material	A	B	C
1494-1	Brass	1/2" F. NPT	1/4" F. NPT	1/2" M. NPT

## Ordering Information

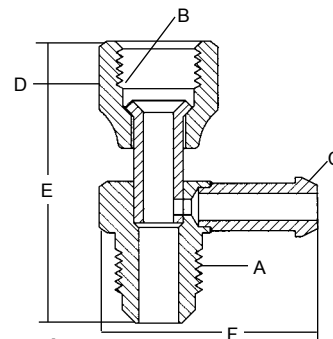
Part Number	Material	A	B
15774-1	Brass	1/4" M. NPT	Female Inverted Flare



Female Inverted Flare x Male NPT

## Ordering Information

Part Number	Material	A	B	C	D	E	F
1328	Brass	5/8" - 18 UNF	5/8" - 18 UNF	1/4" Hose Barb	13/16"	2"	1 1/2"
1331		3/4" - 16 UNF	3/4" - 16 UNF		1 1/16"		
1332		7/8" - 14 UNF	7/8" - 14 UNF		1 1/16"		



# 1" Rotogages® for Large Mobile and Stationary Containers

## A9090 Series

Rotogages® are designed to provide an accurate determination of LPGas 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.



A9091-18LX



Rotogage® Assembly

### 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 <sub>3</sub>	All Sizes

\* Dial permits higher filling level, per NFPA 58.

Tubes for use with A9090 Series Roto Gauges  
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

# 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  $5\frac{3}{4}$ ").

# $\frac{3}{4}$ " Rotogages® for Small Stationary and Mobile LP-Gas Containers

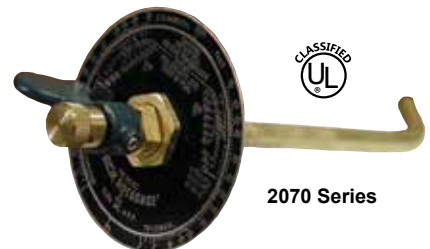
## 2070 Series

Rotogages® are designed to provide accurate determination of LP-Gas container contents. They may be end or side mounted in a standard  $\frac{3}{4}$ " 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".

### Ordering Information

Part Number		For Containers with Inside Diameter	Tank Connection	Valve Seat Orifice
Rotogage®	Dip Tube			
2070C0	2071-L25.7	Up to 40"	$\frac{3}{4}$ M. NPT	No. 54 Drill Size
	2071-L39.7	Up to 60"		

NOTE: The dip tube must be cut to the required length ( $\frac{1}{2}$ " of container inside diameter minus  $\frac{1}{2}$ "), when mounted on center line of tank.



2070 Series

# 1 1/4" 2" & 3" Swing-Check ESVs for Bulk Plants 6010, AA6010, 6016 and 6024 Series

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.

## Ordering Information



Part Number	For Use With:	Inlet and Outlet Connections	Remote Pneumatic Operation		Liquid Flow Capacity at 10 PSIG Drop (GPM)
			Remote Pneumatic Close	Remote Pneumatic Open/Close	
6010	LP-Gas	1 1/2" F. NPT	6016-60D	6016-60C 6016RA	259
AA6010	NH <sub>3</sub>	1 1/2" F. NPT			233
6016	LP-Gas	2" F-NPT			711 (LP-Gas)
AA6016	NH <sub>3</sub>	2" F-NPT			640 (NH <sub>3</sub> )
6024	LP-Gas	3" F-NPT			1325 (LP-Gas)
AA6024	NH <sub>3</sub>	3" F-NPT			1173 (NH <sub>3</sub> )



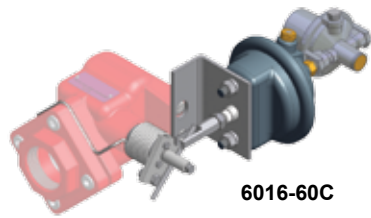
6010



6016



6016-60D



6016-60C



6016-RA

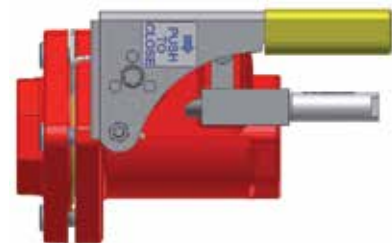


6024

## 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.



6016 with 6016-60D Remote Close Actuator

## Ordering Information

Part Number	Description
7781AFPN-1	Cylinder assembly kit to convert 7781AF ESVs to pneumatic shutdown.
6016-60D	Cylinder assembly kit to convert 6016 ESVs to pneumatic shutdown.
7605PN-50	Pneumatic remote shutdown system kit, complete with 100' of tubing, fittings, 1 charging valve assembly and 1 remote shutdown valve assembly
7605APN-8A	Extra shutdown valve assembly
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.

### 7605PN-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.



## 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.

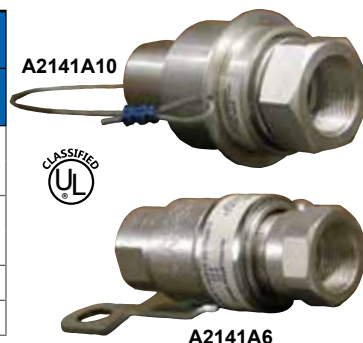
NOTE: It is recommended that pull-away valves be maintained and safety tested periodically to confirm that they will separate properly in the event of a pull-away. Lubrication **every six months** is essential to the pull-away's operation. Dry nitrogen or other inert gas is suggested as a source of pressure 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.

### 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)*			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A2141A6	¾"	130	80	3¾"	11	16	25	36
A2141A6L**								
A2141A8	1"	75	50	4¼"	21	30	47	67
A2141A8L**								
A2141A10	1¼"	160	25	5½"	52	75	120	170
A2141A16	2"	300	50	14¾"	250	350	550	750

\* To Determine NH<sub>3</sub> liquid flow capacity, multiply by .90.



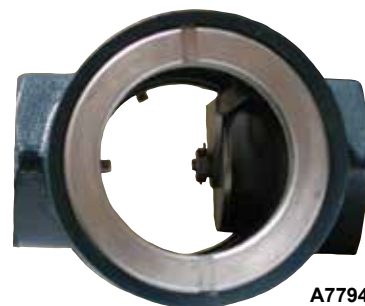
## Sight Flow Indicators for Bulk Plants A7794 and A7796

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 assure 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



### Ordering Information

Part Number	A Inlet/Outlet Connections	B Length
A7794	2" F. NPT	5½"
A7796	3" F. NPT	7¾"

## Heavy Duty Swing Check with Flow Indicator

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.

### Ordering Information

Part Number	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 PSIG Drop GPM
A7616	LPG & NH <sub>3</sub>	2" F-NPT	711-GPM(LPG) 640-GPM(NH <sub>3</sub> )
A7624		3" F-NPT	1325-GPM(LPG) 1173-GPM(NH <sub>3</sub> )





# Hydraulic Automatic Cylinder Filling System 7194MD and 7194HD

## Application

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.

The RegO® automatic cylinder filling system is designed for use with these scales only:

### FAIRBANKS-MORSE SCALES

New Style - 1280A Double Beam Scale or Single Beam Scales 1124A and 1174A.

Old Style - 1280 Double Beam Scale or Single Beam Scale 1123 with or without Howe No. 12108 "Over or Under" Indicator.

### HOWE SCALES

(with or without Howe No. 8325 Balance Indicator)

—No. 54X Wood Pillar and Shelf Scale.

—No. 57 Steel Pillar and Shelf Scale (single beam).

—No. 57X Steel Pillar and Shelf Scale (double beam).

## Features

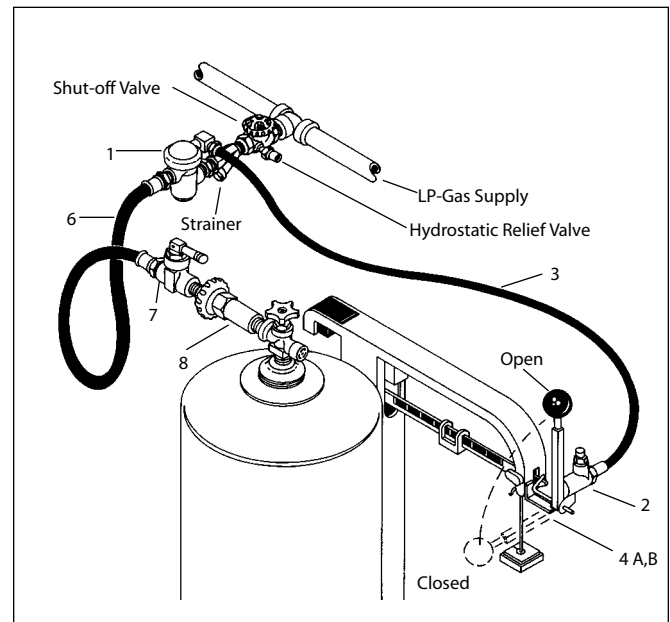
- Completely self-contained with no electrical source or wiring required.
- Works hydraulically, like brakes on a car.
- Filling stops automatically when cylinders reach pre-set weight.
- Up to four stations can be handled by one individual.

### How It Works

The scale beam weight is adjusted to the desired filled weight and the empty cylinder is placed on the scale. The loading hose is connected to the cylinder valve, and the lever on the master cylinder is moved to the vertical position. When the quick-acting valve on the loading hose is opened, the cylinder will rapidly fill. The master cylinder lever is designed to trip, move to a horizontal position and automatically shut off the control valve as soon as the scale reaches the pre-set filled weight.

Components may be ordered separately with piping done by the installer. Two completely assembled manifold configurations are also available.

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	½" NPT Female, with ⅛" NPT Female Hydraulic Connection	7177
2	Master Cylinder, with Actuator Lever	⅛" NPT Hydraulic Connection	7188
3	Hydraulic Hose Assembly	⅜" I.D. with ⅛" NPT Male Ends, 43½" 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	1½ ounce	7188-21
6	Propane Filling Hose Assembly	½" I.D., with ½" NPT Male Ends. 50½" Overall Length	7193D
7	Quick-acting Shut Off Valve	½" NPT INlet X ¼" NPT Outlet	7901TB
8*	Soft Nose Cylinder Connector	¼" NPT Male X POL Male	7193D-10

## 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.

### Ordering Information

Part Number	Applications	Inlet Connection	Outlet Connection	Materials
7193D-10	Filling of DOT Cylinders with POL Connections	¼" M. NPT	M. POL (CGA 510)	Brass & Stainless Steel
7193U-10	Filling of DOT Cylinders with Type I Connections		Type 1 Connection (1½" F. ACME)	Brass



7193U-10



7193D-10

## 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.

### 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 (1½" F. ACME)	Brass



7193T-10

## 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 1¼" 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 assures high filling rates. An integral check closes when disconnected, eliminating the need to close any valves manually to disconnect the charging hose.

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	1¼" 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.



7193L-10A



## 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.

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



7193K-10B

\* 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 1/8" M.NPT, it can be installed at any convenient level.

### Ordering Information

Part Number	Container Connection	Service Connection	Liquid Level Vent
A2805C	3/4" M. NPT	1/4" F. NPT for Gauge Mounting	Knurled*

\* Has 1/8" F. NPT opening for installing separate dip tube.



A2805C

## 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.

### Ordering Information

Part Number	Inlet Connection	Outlet Connection
12802	1/4" F. NPT	1/4" M. NPT



12802

## Vent Valves 3165C, 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.

All these valves incorporate a No. 54 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	1/4" M. NPT	Knurled	2550-40P
3165S			Slotted	
TSS3169	LP-Gas & NH <sub>3</sub>	Tee Handle		

## 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. These valves are normally furnished with a 12", 3/16" O.D. dip tube and incorporate a No. 54 drill size orifice.

An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.

### Ordering Information

Part Number	Service	Connection	Actuation	Dip Tube Length	Accessories
					Warning Plate Kit
3165CF*	LP-Gas Only	1/4" M. NPT	Knurled	*	2550-40P
3165SF12.0			Slotted	12"	
TA3169F12.0			Tee Handle		



TA3169F12.0



3165SF12.0

## Spanner Wrench for ACME Connectors 3195-50

This aluminum spanner wrench is especially designed for use with 2¼" and 3¼" ACME couplings, adapters and caps.

### Ordering Information

Part Number	For Use With ACME Connector Size
3195-50	2¼" & 3¼"



## Pressure Gauges

Especially designed in a variety of sizes and construction for the LP-Gas and anhydrous ammonia industry.

All RegO® pressure gauges have a ¼" M. NPT connection unless otherwise noted.

### Ordering Information

Part Number	Service	Case Material	Maximum Pressure	Case Size	Increment Divisions
2434A-2*	LP-Gas Only	Steel	35" w.c. and 20 oz. (Dual)	2½"	1" w.c. and 1 oz.
2434-2**					
3226A-3		Brass	30 PSIG	2"	½ PSI
2411					
5575		Steel	60 PSIG	2"	1 PSI
5547					
5576					
1286		Brass	100 PSIG	2"	2 PSI
948					
612**		Steel	300 PSIG	2"	5 PSI
948B					
A8060	NH <sub>3</sub> and LP-Gas	Steel	60 PSIG	2½"	5 lb.
A8150			150 PSIG		
A8400			400 PSIG		

\* ¼" Hose Connection  
\*\* 1/8" M. NPT Connection



## Needle Valves 1224, 1316 and 1318

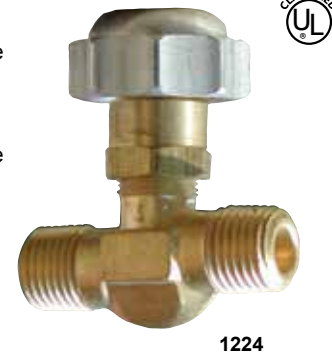
These valves are high quality, "true" throttling valves. Unlike most so-called needle valves, both the body seat and stem are tapered to provide fine, precise control over a wide range of adjustment without stem galling.

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.

### Ordering Information

Part Number	Inlet Connection	Outlet Connection	Height	Length
1224WA	¼" M. NPT	¼" M. NPT	1 9/16"	1 ¼"
1316WA	9/16" - 18 L.H.	⅜" M. NPT		
1318WA		¼" M. NPT		



1224

# L-102 Buyer's Guide Cross Reference by Part Number

302.....	18	A8525.....	60	AA3126L250.....	44	A3211D110.....	72
302V.....	18	8556.....	28	AA3126L312.....	44	A3212R105.....	73
302V9.....	18	12472.....	59	3127G.....	44	A3212R175.....	73
302V9LS.....	18	12802.....	87	3127G.....	45	A3212R250.....	73
612.....	88	12982.....	80	3127H.....	45	A3212RT105.....	73
901-400.....	30	10538P.....	76	3127J.....	45	A3212RT175.....	73
901C1.....	29	1212 KIT.....	21	3127K.....	44	A3212RT250.....	73
901C3.....	29	1224WA.....	88	3127K.....	45	A3213R150.....	73
901C5.....	29	12982G.....	80	3127L.....	45	A3213R200.....	73
903-400.....	30	1316WA.....	88	3127P.....	45	A3213R300.....	73
907FP.....	77	1318WA.....	88	3127U.....	45	A3213R400.....	73
948.....	88	1350E.....	21	3129G.....	44	A3213RT150.....	73
948B.....	88	1350R.....	21	3129G.....	45	A3213RT200.....	73
970.....	20	1450E.....	21	3129H.....	45	A3213RT300.....	73
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