



## **LP-Gas & Anhydrous Ammonia Equipment**

**ECII** *Engineered Controls  
International, Inc.*

# **Section F Excess Flow, Check, Filler and Vapor Equalizing Valves**

**F**

## Limited Warranty and Limitation of Liability

### LIMITED 10 YEAR WARRANTY AND LIMITATION OF LIABILITY

#### LIMITED 10 YEAR WARRANTY

Engineered Controls International, Inc. ("ECII") 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 ECII at 100 Rego Drive, Elon, NC 27244, ECII, 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 ECII 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 ECII'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, ECII 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. ECII disclaims all warranties not stated herein.

### LIMITATION OF LIABILITY

ECII'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.

ECII shall not be liable for incidental, consequential or punitive damages or other losses. ECII 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 ECII for technical advice based upon limited facts disclosed to ECII. If ECII 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, ECII 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.

### NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of ECII products. Since most users have purchased these products from ECII 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 ECII, 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 ECII's distributor for replacement or repairs under the terms of ECII's Limited Warranty in no way determines ECII's obligations under this Limited Warranty.

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

## Foreword

This catalog describes a complete line of equipment available from Engineered Controls International, Inc. 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).

### 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 Engineered Controls International, Inc., 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.

### Warning

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

### Notice

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

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

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

### Filters

ECII® 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.

## Contents

## Page

Back Pressure Check Valves .....	F25
Chek-Lok® Excess Flow Valves .....	F18
Chek-Lok® Operation .....	F17
Cross Reference by Part Number .....	F28
Double Check Filler Valves .....	F20
Excess Flow Valves .....	F8
Limitations of Excess Flows .....	F7
Safety Warning for Excess Flows .....	F4
Testing of Excess Flows .....	F7
Troubleshooting of Excess Flows .....	F6
Vapor Equalizing Valves .....	F23
Warnings and Labels .....	F27

# LP-Gas Excess Flow Valves

## Safety Warnings



### Purpose

In its continuing quest for safety, Engineered Controls International, Inc. 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 "ECI® 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

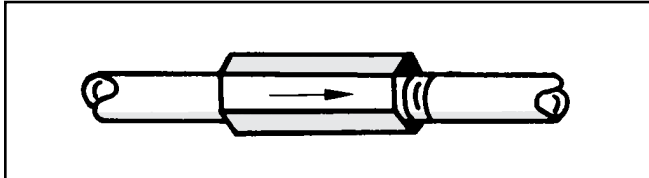
It is recognized that warnings should be as brief as possible, but the factors involved in excess flow valve failures to perform are not simple. They need to be fully understood. If there is a simple warning, it would be:

**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.

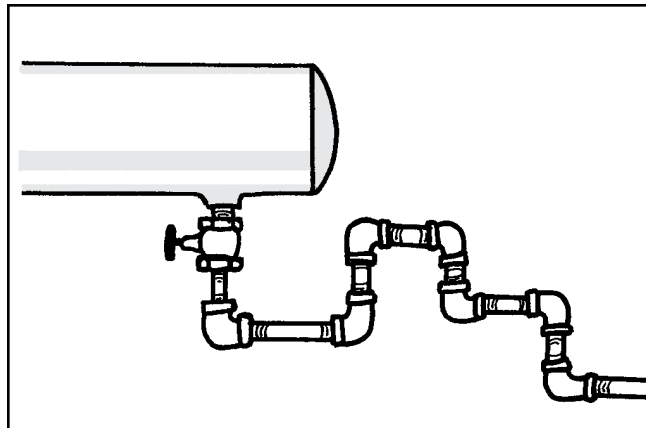
Engineered Controls International, Inc. provides excess flow valves with a number of closing ratings. Engineered Controls International, Inc. obviously can take no responsibility for the proper selection or correct installation of any valve.

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

## Causes of Failure to Close

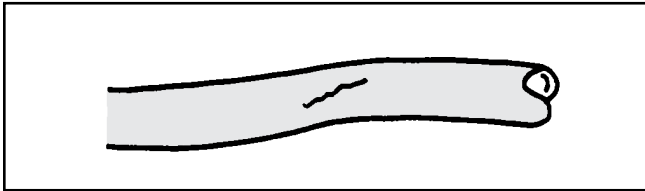
Installers, LP-Gas plant managers and service personnel should be aware that the excess flow valves may not close if these conditions are present.

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

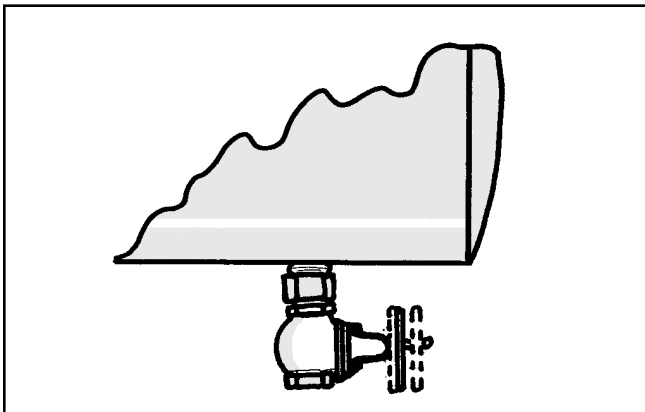


## LP-Gas Excess Flow Valves

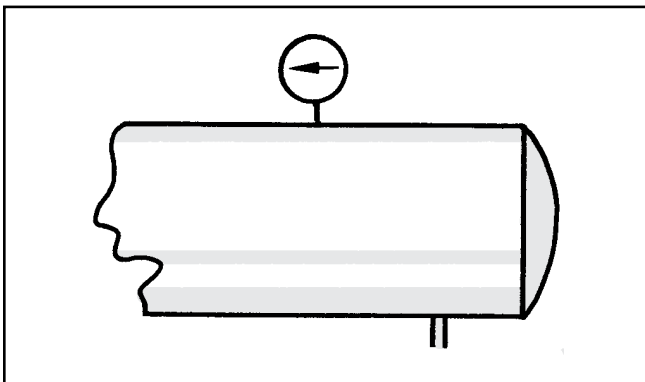
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.



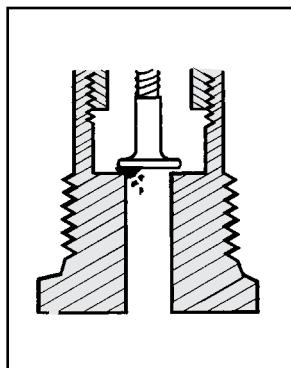
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.



4. LP-Gas pressure upstream of the excess flow valve, particularly due to low temperature, is not high enough to produce a closing flow rate.



5. Foreign matter (such as welding slag, scale or sludge) is lodged in the valve and prevents closing.



Because of these limitations, it is good industry practice to NOT rely entirely on excess flow valves for protection. Installation of emergency shut-off valves with remote controls is recommended in addition to excess flow valves.

### Testing

The National Propane Gas Association Safety Bulletin #113-78 states:

"In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating. This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under a sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

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

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition, and the flow rate sizing for those test conditions."

### General Warning

All ECII® 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 ECII® 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.

# Troubleshooting Excess Flow Valve Installations

## Periodical Inspections for Excess Flow Valves

Excess flow valves should be tested and proven at the time of installation and at periodic intervals not to exceed one year. CAUTION: Testing an excess flow valve in the summer when tank pressures are high will not prove that the same valve will also function under low pressure conditions in the winter. Once a year testing should be conducted during the winter.

The test should include a simulated break in the line by the quick opening of a shut-off valve at the farthest point in the piping that the excess flow valve is intended to protect. If the excess flow valve closes under these conditions, it is reasonable to assume that it will close in the event of accidental breakage (clean break) of the piping at any point closer to the excess flow valve.

The National Propane Gas Association Safety Bulletin Number 113-78 states:

In order to test an excess flow valve in a piping system, the flow through the valve must be made to exceed the valve's closing rating. This testing should only be attempted by trained personnel familiar with the process. If no one at the facility has experience in proper testing, outside expert help should be obtained. The exact procedure used may vary with the installation, advisability of gas discharge and availability of equipment.

In general, most testing makes use of the fact that excess flow valves are "surge sensitive" and will close quicker under sudden flow surge than under steady flow. A sufficient surge can often be created by using a quick open/close valve to control sudden, momentary flow into a tank or piping section containing very low pressure. An audible click from the excess flow valve (and corresponding stoppage of flow) indicates its closure.

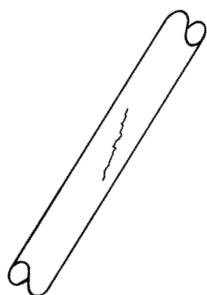
A test involving venting gas to the atmosphere is hazardous and may be impractical or illegal.

Any test of any excess flow valve will not prove that the valve will close in an emergency situation, due to reasons cited before. This test will only check the valve's condition and the flow rate sizing for those test conditions.

### What prevents excess flow valves from closing when the line breaks?

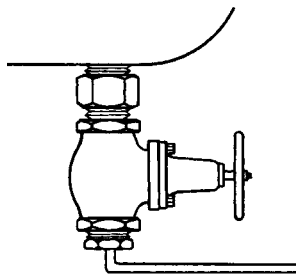
For one or a combination of the following reasons, excess flow valves have been prevented from closing in emergencies:

#### 1. Not a Clean Break



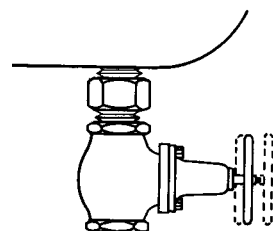
Hoses with a split or tear, and pipe lines not completely severed may be emitting LP-Gas in an amount insufficient to cause an "excess" flow. The amount of LP-Gas which can escape through such breaks may be even less than the flow during normal transfer service and under these conditions the excess flow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

#### 2. Line Restriction Too Great



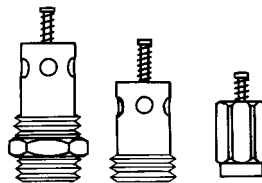
An excess flow valve installed in a tank outlet will not close if the line beyond it is reduced or if the flow is otherwise restricted by too many fittings or too long a run because the line is incapable of passing the amount of LP-Gas necessary to create an "excess" flow. This condition should be corrected when testing a system by simulating a break at the farthest possible point and replacing any restrictive hose, pipe or fittings.

#### 3. Improper Operating Practice



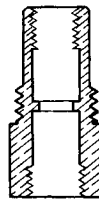
A restriction can also be imposed upon the excess flow valve by an improperly opened valve at the tank outlet. The shutoff valve should be either fully opened or fully closed. If "throttled," the valve could reduce the amount of LP-Gas passing through the excess flow valve in a sufficient amount to keep it from closing. Throttling operations should not be performed in the lines being protected by excess flow valves.

#### 4. Improper Selection



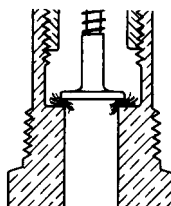
The many types of excess flow valves available are designed for specific jobs. The excess flow valve selected should remain open during normal flow but close at "excess" flow. An inspection which simulates a line break prior to start-up operations will determine if the proper valve has been selected.

#### 5. Tampering with Excess Flow Valves



Sometimes an operator, annoyed with frequent closures of an excess flow valve with too low a rating, has mutilated the valve and forgotten to replace it with a properly rated excess flow valve. A pre-test of the system would reveal this and allow the excess flow valve to be replaced.

#### 6. Impurities in the Line



Dirt, weld slag, broken drill taps, and various other foreign objects have been found jammed between the valve disc and valve seat to prevent excess flow valves from closing. A pre-test of the system would also discover this.

# The Limitations of Excess Check Valves for LP-Gas

Excess flow check valves have been of help in limiting gas loss in many incidents involving breakage of hoses and transfer piping. Thus, they do provide a useful safety function in LP-Gas systems. However, there have also been transfer system accidents where excess flow valves have been ineffective in controlling gas loss due to a variety of conditions and to the inherent limitations of these valves. This bulletin explains what protection excess flow valves can offer, points out conditions which can interfere with that protection, and offers suggestions for effective excess flow valve installation.

An excess flow valve is a protective device to help control the discharge of product in the event of complete breakage of pipe lines or hose rupture. However, an excess flow valve can only offer limited protection from gas discharge, because it will only close under those conditions which cause the flow through the valve to exceed its rated closing flow, and even when closed it necessarily allows some "bleed" past the valve.

**An excess flow valve is not designed to close and thus may not provide protection, if any of the following conditions are present:**

1. The piping system restrictions (due to pipe length, branches, reduction in pipe size, or number of other valves) decrease the flow rate to less than the valve's closing flow. (Valve should be selected by closing flow rating — not just by pipe size).
2. The break or damage to the downstream line is not large enough to allow enough flow to close the valve.
3. A shut-off valve in the line is only partially open and will not allow enough flow to close the excess flow valve.
4. LP-Gas pressure upstream of the excess flow valve, particularly due to low temperature, is not high enough to produce a closing flow rate.
5. Foreign matter (such as welding slag) is lodged in the valve and prevents its closing.
6. A buildup of process material (sludge), which may be found in LPGas, 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 Engineered Controls International, Inc. and refer to NFPA 58.

Prepared by  
NATIONAL PROPANE GAS ASSOCIATION

The purpose of this bulletin is to set forth general safety practices for the installation, operation, and maintenance of LP-Gas equipment. It is not intended to be an exhaustive treatment of the subject, and should not be interpreted as precluding other procedures which would enhance safe LP-Gas operations. The National Propane Gas Association assumes no liability for reliance on the contents of this bulletin.

# Excess Flow Valves

## General Information

RegO® Excess Flow Valves have been designed, developed, and manufactured for a wide variety of industry needs for more than three decades.

Throughout the years, those concerned with installing and operating bulk plant facilities have looked to RegO® products with confidence for reliable, long-lasting valves as required by the National Fire Protection Association (NFPA) Standards 58 and 59, as well as any state, provincial, and local regulations.

It is a responsibility we have not taken lightly. RegO® products continue to not only assess the most effective designs, but anticipate and meet the industry's changing requirements. Toward that goal, RegO® products include over fifty different types and sizes of excess flow valves (most of which are listed by Underwriters Laboratories) to meet the needs of the LP-Gas and anhydrous ammonia industries.

## An Explanation and Warning

An excess flow valve is a spring-loaded check valve which will close only when the flow of fluid through the valve generates sufficient force to overcome the power of the spring holding it open. Each valve has a closing rating in gallons per minute and CFH/air.

The selection of a proper closing rating is critical. It requires a technical understanding of the flow characteristics of the piping system, including restrictions of the piping and other valves and fittings downstream of the excess flow valve.

System designers and operating people must understand why an excess flow valve, which remains open in normal operations, may fail to close when an accident occurs.

**Warning: A downstream break in piping or hoses may not result in sufficient flow to close the valve.**

## How They Work

Excess flow valves permit the flow of liquid or vapor in either direction. This flow is controlled in only one direction (the direction of the arrow stamped on the valve). If the flow in that direction exceeds a predetermined rate (shown in this catalog for each valve), the valve automatically closes.

The valve disc is held in the open position by a spring. When the flow creates a pressure drop across the valve disc that overcomes the preset load on the spring, the valve disc moves to the closed position. It remains closed until the force on both sides of the valve disc are approximately equal (a small bleed hole in the disc of each valve permits equalization), then the spring automatically reopens the valve. When a line is completely broken, the pressure cannot equalize and the excess flow valve remains closed until the line is repaired. Because the bleed hole in each valve disc permits equalization of pressure, excess flow valves do not provide a 100 percent type shut-off.

## Proper Installation

Since excess flow valves depend on flow in order to close, the line downstream of the excess flow valve should be large enough not to excessively restrict the flow. If the piping is too small, unusually long or restricted by too many elbows, tees and other fittings, consideration should be given to the use of larger size pipe fittings.

An excess flow valve in a pump suction line cannot be expected to close in the case of a clean break in the line beyond the pump, as the pump constitutes too great a restriction, even if running.

Good piping practices dictate the selection of an excess flow valve with a rated closing flow of approximately 50 percent greater than the anticipated normal flow. This is important because valves which have a rated closing flow very close to the normal flow may chatter or slug closed when surges in the line occur during normal operation, or due to the rapid opening of a control valve.

All installations must be in accordance with NFPA Standards 58 and 59, as well as state, provincial and local regulations.

Cotter pin prevents loss of spring retainer due to vibration in service.

Spring retainer.

Stainless steel spring for consistent closing flow, long service life.

Welded for strength.

Precision machining.

Generous flow channels for lowest pressure drop are particularly important in pump suction lines.



# Excess Flow Valves for Liquid or Vapor Service

## 1519C Series

### Application

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.

### Features

- Precision machined
- Generous flow channels provide low pressure drop.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.

### Materials

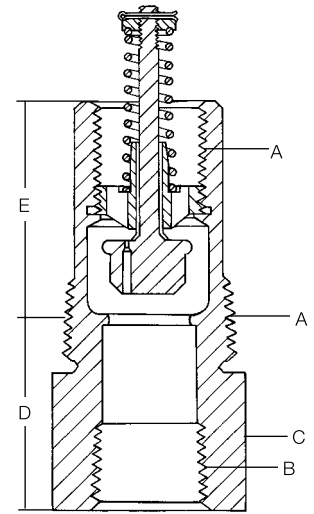
#### 1519C2

Body ..... Brass  
Valve Poppet w/Stem ..... Brass  
Spring ..... Stainless Steel  
Guide ..... Brass



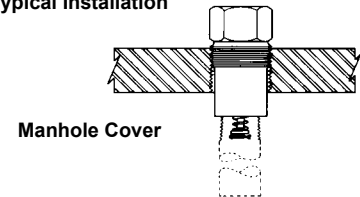
#### 1519C4

Body ..... Brass  
Valve Disc ..... Cadmium Plated Steel  
Stem ..... Stainless Steel  
Spring ..... Stainless Steel  
Guide ..... Ductile Iron

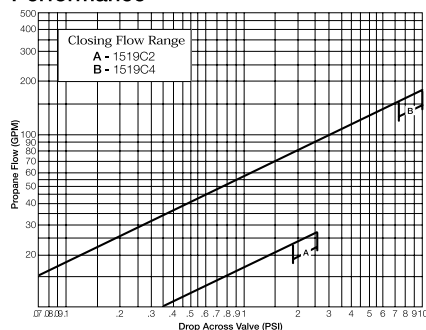


1519C2

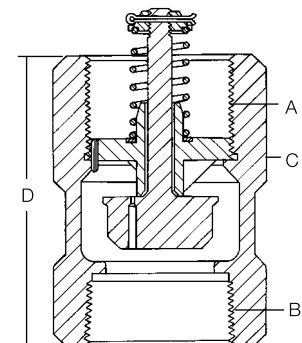
#### Typical Installation



### Performance

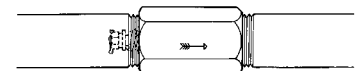


NOTE: Multiply flow rate by .94 to determine liquid butane flow.



1519C4

#### Typical Installation



### Ordering Information

Part Number	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx.)	E Threaded End to Port	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"	4½"	-	2"	170	28,590	48,600

\* 1" Female Dip Pipe Connection

\*\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.  
NOTE: Multiply flow rate by .94 to determine liquid butane flow.

# Excess Flow Valves for Liquid or Vapor Line Service

## 1519A Series, 1519B Series and A1519 Series

### Application

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.

### Features

- Precision machined.
- Generous flow channels provide low pressure drop.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.

### Materials

#### 1519A Series and 1519B Series

Body ..... Brass  
Valve Poppet w/Stem ..... Brass  
Spring ..... Stainless Steel  
Guide ..... Brass

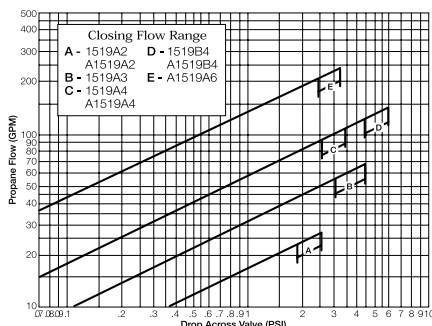


1519A2, 1519A3, 1519A4, 1519B4,  
A1519A2, A1519A4, A1519B4

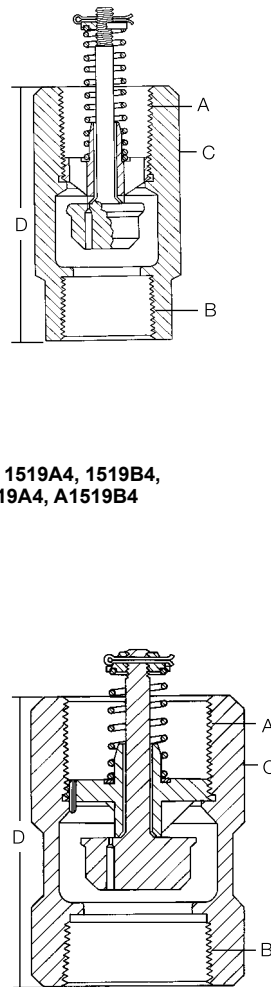
#### A1519 Series

Body ..... Cadmium Plated Steel  
Valve Disc ..... Cadmium Plated Steel  
Stem ..... Stainless Steel  
Spring ..... Stainless Steel  
Guide ..... Ductile Iron

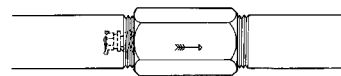
### Performance



A1519A6



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



Typical Installation

### Ordering Information

Part Number	Brass or Steel	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx)	Approximate Closing Flows*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
1519A2	Brass	1"	1"	1¾"	3⅝"	25	5,000	8,800
A1519A2	Steel							
1519A3	Brass	1½"	1½"	2¼"	4"	60	11,500	20,200
1519A4		2"	2"	3"	4⅞"	100	19,000	34,500
A1519A4	Steel							
1519B4	Brass	133	27,700	50,300				
A1519B4	Steel				3"	3"	4"	6⅞"
A1519A6		225	45,000	82,000				

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

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

### F10

# Excess Flow Valves for Liquid or Vapor 3272 Series, 3282 Series, 3292 Series, A3272 Series, A3282 Series, A3292 Series, 7574 and 12472

## Application

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.

## Features

- Precision machined.
- Generous flow channels provide low pressure drop.
- Stainless steel spring provides consistent closing flow and long service life.

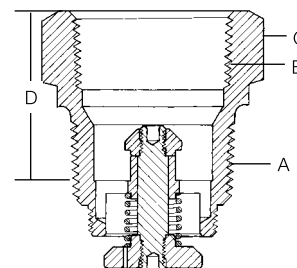
## Materials

### Series 3272, 3282, 3292, 7574, 12472

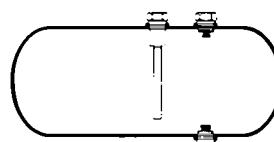
Body ..... Brass  
 Seat Disc ..... Brass  
 Stem ..... Brass  
 Spring ..... Stainless Steel  
 Guide (12472 ONLY) ..... Plastic

### Series A3272, A3282, A3292

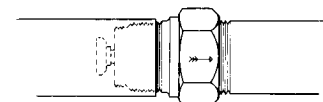
Body ..... Cadmium Plated Steel  
 Seat Disc ..... Cadmium Plated Steel  
 Stem ..... Cadmium Plated Steel  
 Spring ..... Stainless Steel



### Typical Installation

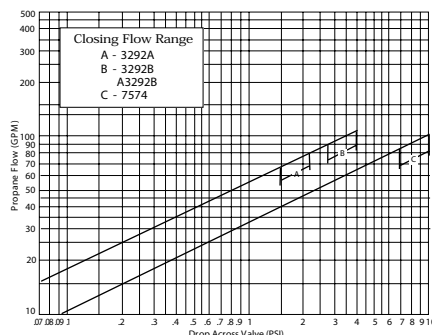
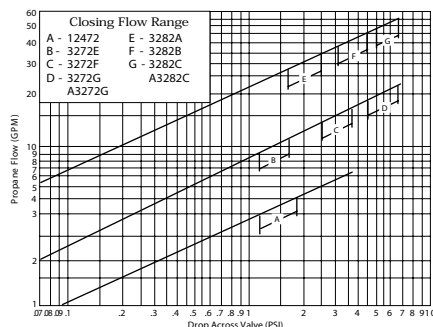


Container Service



Pipe Line Service

### Performance



## Ordering Information

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

Part Number	Brass or Steel	A Inlet Connection (M. NPT)	B Outlet Connection (F. NPT)	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
12472	Brass	¾"	¾"	1⅝"	1⅝"	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"	1⅞"	30	5,850	10,000
3282A	Brass					40	7,600	13,600
3282B						50	9,000	16,300
3282C	Steel					90	15,200	28,100
A3282C	Brass	1½"	1½"	2¼"	1¾"	70	14,000	25,000
7574						75	14,200	24,800
7574L	Steel	2"	2"	2⅞"	1⅞"	100	18,100	32,700
3292A						122	22,100	37,600
A3292A								
3292B	Brass							
A3292B								
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.



Engineered Controls International, Inc. 100 RegO Dr. P.O. Box 247 Elon, NC 27244 USA www.regoproducts.com Phone (336) 449-7707 Fax (336) 449-6594

# Excess Flow Valves for Container Service

## A7537 Series, A7539 Series, A8523 and A8525

### Application

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.

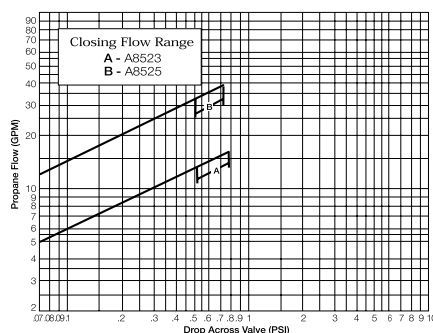
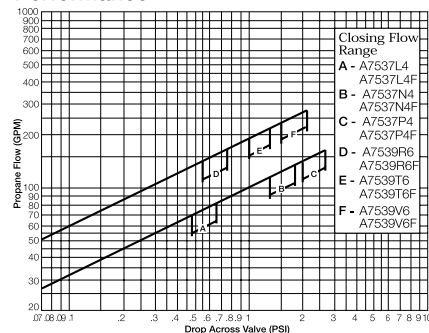
### Features

- Precision machined.
- Generous flow channels provide low pressure drop minimizing cavitation in pump suction lines.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.
- Separate models for installation in either half or full couplings.

### Materials

Body .....	Cadmium Plated Steel
Body (A7539 Series Only) .....	Ductile Iron
Seat Disc .....	Cadmium Plated Steel
Stem .....	Stainless Steel
Spring .....	Stainless Steel
Guide .....	Cadmium Plated Steel

### Performance

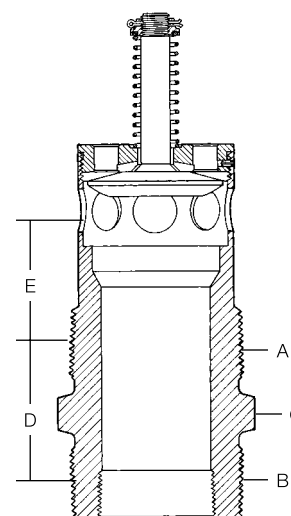


NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

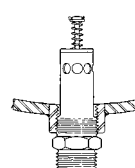
### Ordering Information

Part Number	For Use With This Type Coupling	A Inlet Connection M. NPT	B Outlet Connection NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
A8523	Half	3/4"	3/4" Male	1 1/8"	1 3/4"	15	5,170	8,800
A8525	Half	1 1/4"	1 1/4" Male	1 3/4"	2 1/8"	35	12,540	21,560
A7537L4	Half	2"	2" Male and 1 1/4" Female	2 5/8"	2 1/2"	75	13,000	25,600
A7537L4F	Full					125	25,000	42,500
A7537N4	Half					150	30,500	52,000
A7537N4F	Full					150	30,500	52,000
A7537P4	Half	3"	3" Male and 2" Female	3 3/4"	3 1/8"	150	32,100	55,500
A7537P4F	Full					200	39,400	68,300
A7539R6	Half					250	51,100	88,700
A7539R6F	Full							
A7539T6	Half							
A7539T6F	Full							
A7539V6	Half							
A7539V6F	Full							

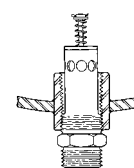
\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.



### Typical Installation



Half Coupling



Full Coupling



# Excess Flow Valves for Vapor or Liquid A2137 Series and 2139 Series

## Application

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.

## Features

- Precision machined.
- Cotter pin helps prevent loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.
- Generous flow channels provide low pressure drop.

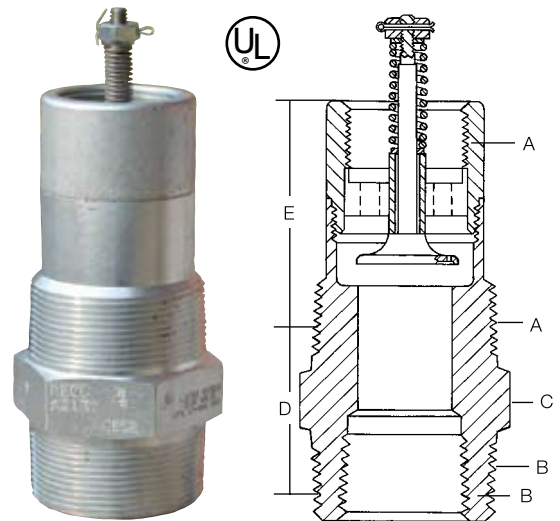
## Materials

### A2137 Series

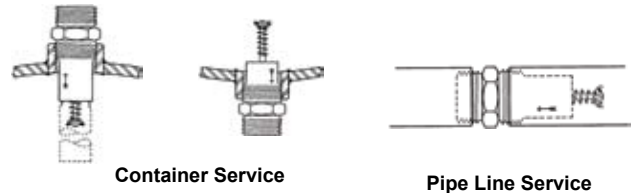
Body ..... Cadmium Plated Steel  
Disc..... Cadmium Plated Steel  
Stem ..... Stainless Steel  
Spring ..... Stainless Steel  
Guide..... Cadmium Plated Steel

### 2139 Series

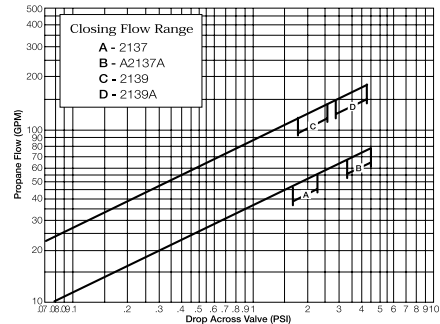
Body ..... Brass  
Disc..... Brass  
Stem ..... Stainless Steel  
Spring ..... Stainless Steel  
Guide..... Brass



### Typical Installations



### Performance



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

## Ordering Information

Part Number	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flows***		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
A2137	2"	2" Male and 1 1/4" Female	2 7/16"	1 1/16"	50	10,000	17,000
A2137A					70	14,000	25,000
2139	3"	3" Male and 2" Female	3 1/2"	1 1/16"	125	26,500	46,000
2139A					160	32,700	57,200

\* 1 1/4" F. NPT Dip Pipe Connection

\*\* 2" F. NPT Dip Pipe Connection

\*\*\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.



# Excess Flow Valves for Flange Mounting in Container Service A3500 Series and A4500 Series

## Application

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.

## Features

- Precision machined.
- Generous flow channels provide low pressure drop minimizing cavitation in pump suction lines.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.

## Materials

Body ..... Cadmium Plated Steel  
Seat Disc ..... Cadmium Plated Steel  
Stem ..... Stainless Steel  
Spring ..... Stainless Steel  
Guide ..... Cadmium Plated Steel

### Flanged Installation In Container

NOTE: The opening in the tank flange should be machined with a 1/4"-45° chamfer at the outer edge. The thread should be tapped one or two turns large as checked by a plug gauge. This and the undersize thread on the valve should permit the valve to be installed so that its outer face is at least flush with the outer edge of the flange.

The valve is screwed into this opening by fitting a 1/4" flat metal piece into the slot and turning until hand tight. A lubricant may be used, but a luting compound is not necessary since this joint does not have to be gas tight.

If any difficulty is experienced in "making up" the valve to fit flush, as indicated, the thread in the tank flange can be tapped.

Design and construction of tank and flange must be in accordance with the appropriate section of the ASME Pressure Vessel Code.

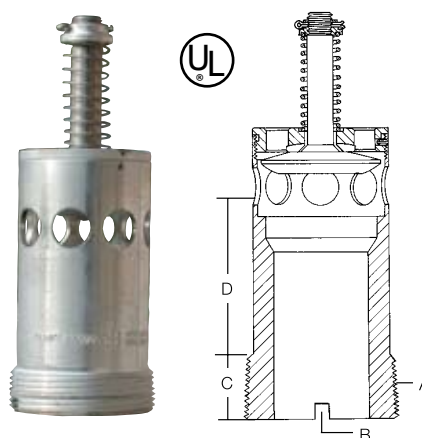
## Ordering Information

Part Number	A Inlet Connection NPT	B For Installation	C Effective Thread (Approx.)	D Threaded End To Port	Approximate Closing Flows*		
					Liquid (GPM Propane)	Vapor SCFH (Propane)	
						25 PSIG Inlet	100 PSIG Inlet
A3500L4	2"	Slotted Body	¾"	1⅝"	75	13,000	22,500
A3500N4					125	25,000	42,500
A3500P4					150	30,500	52,000
A3500R6	3"		1"	1⅞"	150	32,100	55,500
A3500T6					200	39,400	68,300
A3500V6					250	51,100	88,700
A4500Y8	4"		1⅞"	1⅞"	500	89,000	154,000

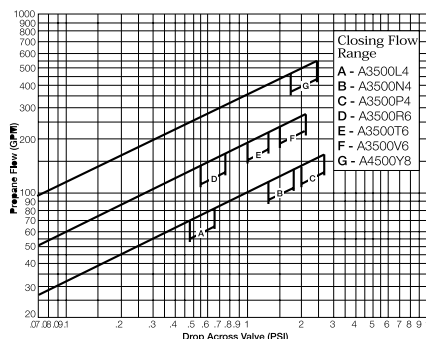
NOTE: Multiply flow rate by .94 to determine liquid butane flow and by .90 to determine liquid anhydrous ammonia flow.

\* 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.

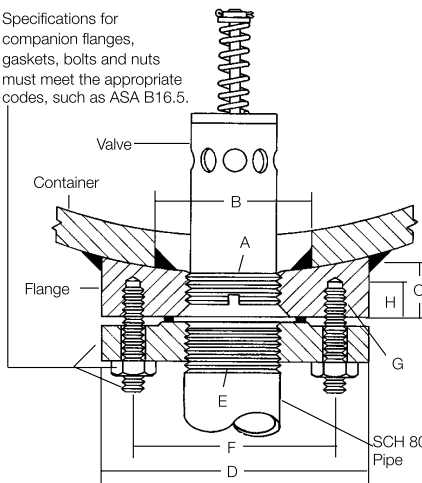
**F14**



## Performance



Specifications for companion flanges, gaskets, bolts and nuts must meet the appropriate codes, such as ASA B16.5.



Key No.	Description	A3400L4, A3500L4, A3500N4, A3500P4	A3400L6, A3500R6, A3500T6, A3500V6	A4500Y8
A	Valve Size (NPT)	2"	3"	4"
B	Tank Opening	3 1/2"	4 1/2"	5 1/2"
C	Thickness (min.)	1"	1 1/4"	1 3/8"
D	Outside Diameter	6 1/2"	8 1/4"	10"
E	Pipe Thread (NPT)	2"	3"	4"
F	Bolt Circle Dia.	5"	6 3/8"	7 1/8"
	Number of Bolt Holes	8	8	8
G	Bolt Hole Thread	5/8" - 11 NC - 2	3/4" - 10 NC - 2	3/4" - 10 NC - 2
H	Bolt Hole Thread (min. eff.)	3/4"	1"	1 1/8"

# Excess Flow Valves for Liquid or Vapor Withdrawal 2723C and A8013D Series

## Application

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.

## Features

- 2723C provides a 3/4" dip pipe inlet connection for top-mounted liquid or bottom-mounted vapor requirements.
- A8013D Series features a 2-position floating valve disc for faster, more efficient container filing.
- Precision machined.
- Stainless steel spring provides consistent closing flow and long service life.
- Generous flow channels provide low pressure drop.

## Materials

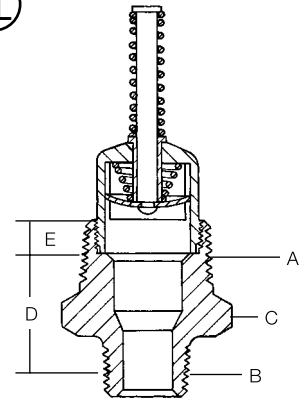
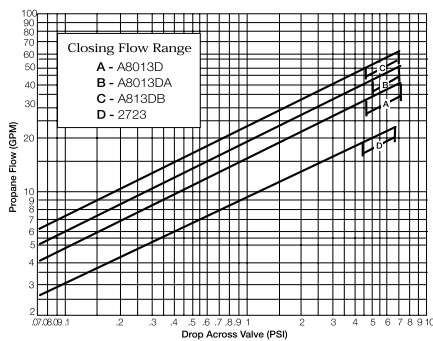
### A8013D Series

Body .....	Cadmium Plated Steel
Disc .....	Stainless Steel
Stem .....	Stainless Steel
Spring .....	Stainless Steel
Guide .....	Cadmium Plated Steel
Insert .....	Stainless Steel

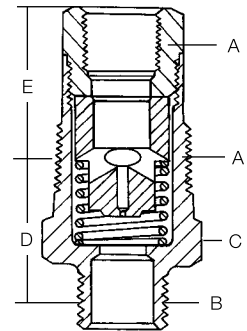
### 2723C

Body .....	Brass
Valve Poppet .....	Brass
Retainer .....	Brass
Spring .....	Stainless Steel

## Performance



A8013D



2723C



## Ordering Information

Part Number	A. Inlet Connection M. NPT	B. Outlet Connection NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow**		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
							25 PSIG Inlet	100 PSIG Inlet
A8013D	1 1/4"	3/4"	1 1/4"	9/16"	-	39	8,700	14,700
A8013DA		1"		2 1/2"		44		
A8013DB		1 1/4"		1 1/16"		55		
2723C	1 1/4"	3/4"	1 1/16"	1 1/4"	3 3/16"	20	3,900	6,900

\* 3/8" F. NPT Dip Pipe Connection

\*\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

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

## Excess Flow Valve for Pressure Gauges 2884D

### Application

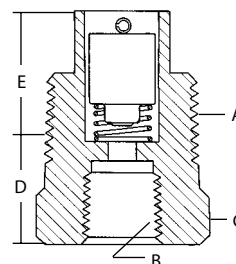
Designed for container use in pressure gauge installations to minimize excess gas discharge in the event the pressure gauge is sheared. A suitable shut-off valve should be installed between this valve and the pressure gauge to allow convenient gauge replacement.

### Features

- Precision machined.
- Suitable for use with all 1/4" M.NPT pressure gauges.

### Materials

Body .....	Brass
Valve .....	Brass
Spring .....	Stainless Steel
Pin .....	Stainless Steel



2884D



### Ordering Information

Part Number	A. Inlet Connection M. NPT	B. Outlet Connection F. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow*		
						Liquid (GPM Propane)	Vapor SCFH (Propane)	
2884D	3/4"	1/4"	1 1/8"	1 1/4"	1 1/8"	N/A	25 PSIG Inlet	100 PSIG Inlet
							60	110

\* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

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

## Excess Flow Valve for DOT Cylinders 3199W

### Application

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.

### Features

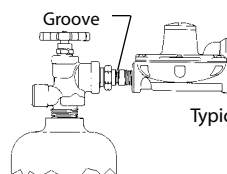
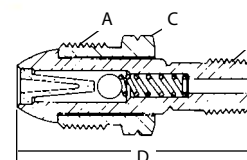
- Integral ball check design.
- Machined groove designed to break-off and allow excess flow valve ball to close.

### Materials

Body .....	Brass
Nut .....	Brass
Bell .....	Stainless Steel
Spring .....	Stainless Steel
Retainer Spring .....	Stainless Steel
Retainer .....	Brass



3199W



Typical Installation



#### NOTE:

No protection is afforded should break-off occur downstream of the groove. Also, restrictions introduced by the regulator may prevent closing of the valve due to limited flow capacity. The valve's purpose is to protect the cylinder valve outlet should the regulator be broken off of its connection (at the groove), in which case it will close. It must not be depended upon to protect against breaks downstream of the regulator.

### Ordering Information

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

### F16

## 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 ECII® 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®

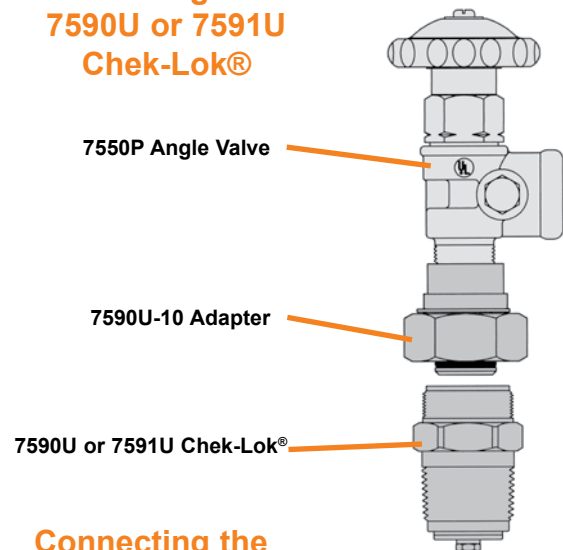
- 1 To re-lock the Chek-Lok, container pressure must be in excess of 35 PSIG. Close shut-off valve and disconnect the hose or piping.
- 2 Open shut-off valve fully. Liquid discharging to the atmosphere should cause the excess flow valve of the Chek-Lok to close, provided tank pressure is 35 PSIG or more.

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.

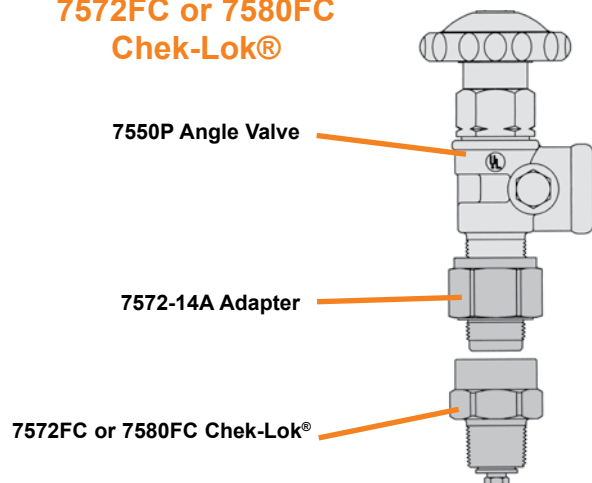
- 3 After the excess flow valve closes, remove the Adapter and Shut-Off Valve Assembly.
- 4 Clean face of Chek-Lok and install the Cap with a gasket. IMPORTANT: Only use the proper Chek-Lok Cap. Do not use a standard pipe cap.

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®

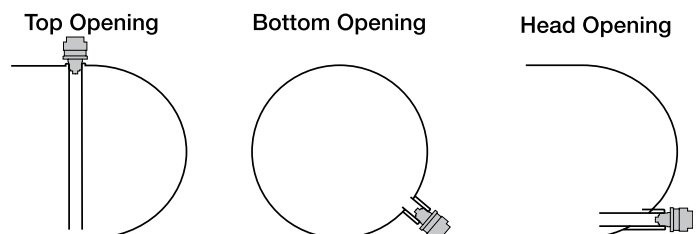


In the absence of a 7550P transfer valve, a 3/4" A7505A Globe Valve or A7506AP Angle Valve may be used. Follow the above procedures using the 7572C-15A adapter instead of the 7572C-14A. Use an ECII 7550P without an adapter in an emergency only.

**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

### Application

Chek-Lok® Excess Flow Valves are designed to provide a convenient means of withdrawing liquid from stationary containers prior to moving the container. The Chek-Lok® permits one transfer shut-off valve with an adapter to be used interchangeably on a number of tanks.

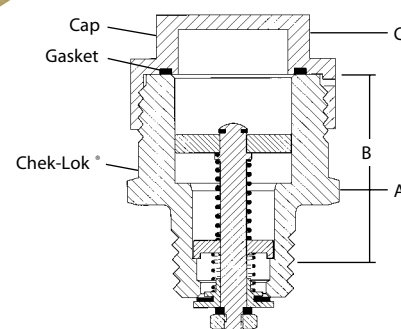
The 7590U and 7591U Chek-Loks® are also designed for use on permanent installations provided the excess flow valve is sized properly for the system and piping. NOTE: In some cases, it may be necessary to use an in-line excess flow valve to protect the downstream piping. This valve is not recommended for use as a liquid source for pumps.

### Features

- Extra strength connection between body and adapter provides increased strength.
- Weep hole in cap provides indicator to verify Chek-Lok® is closed before cap removal.
- Heavy duty brass cap requires at least 3 1/2 full turns for removal.
- O-ring seal on adapter provides a gas tight seal before the adapter opens the equalizing stem.
- Eliminates need for individual transfer valves at each container.
- UL listed.



7590U with Cap



### Materials

Body .....	Brass
Stem .....	Brass
Spring .....	Stainless Steel
Seals .....	Sunthetic Rubber
Valve Poppet .....	Brass
Gasket .....	Nylon

Chek-Lok® Number	Inlet Connection	Outlet Connection	C. Body Wrench Hex Flats	B. Approximate Effective Length	C. Cap Wrench Hex Flats	Approximate Closing Flow, Liquid GPM (Propane)*
7590U	3/4" M. NPT	1 1/8" UNF	1 1/8"	1 1/16"	1 1/8"	20
7591U	1 1/4" M. NPT		1 3/4"	1 1/16"		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

### Application

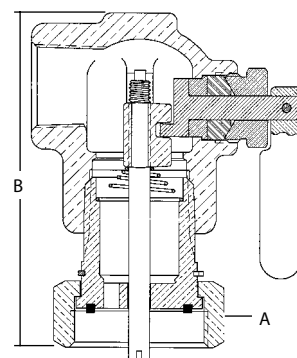
Designed specifically for use with RegO® 7590U and 7591U Chek-Lok® Excess Flow Valves. Adapter's operating handle opens and closes equalizing stem in the Chek-Lok® valve. Eliminates gas flow through Chek-Lok® valve when installing or removing adapter. Use of RegO® adapter ensures proper connections and opening of the check mechanism.

### Features

- Built in nylon gasket provides a gas tight seal.
- Adapter can be installed without depressing the equalizing stem of the Chek-Lok®.
- Design eliminates the need to slug excess flow feature of Chek-Lok® when removing the adapter.
- Built in bleeder valve allows controlled discharge of liquid before removing the adapter.



7590U-20

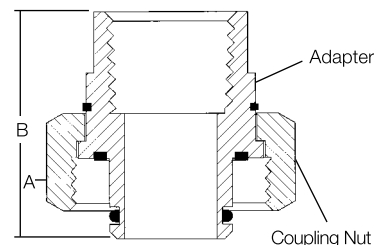


### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A Wrench Hex Flats	B Approximate Length
7590U-20	1 1/8" F. NPT	3/4" F. NPT	1 1/4" F. NPT	4 1/8" F. NPT

## Union Style Adapters for 7590U and 7591U Valves

The 7590U-10 adapter must be used to connect to the 7590U and 7591U Chek-Lok. This insures a proper connection to open the check mechanism. A built in nylon gasket provides a gas tight seal.



7590U-10

### Ordering Information

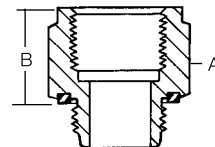
Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Length
7590U-10	1½" UNF	¾" F. NPT	1¾"	1⅜"

## Adapters for 7572FC and 7580FC Valves

These adapters must be used to connect to the 7572FC and 7580FC Chek Loks to open the check mechanism properly. A built in nylon gasket provides a gas tight seal.



**7572C-14A**  
For Transfer Valves

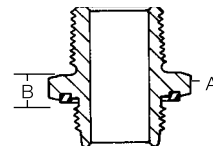


### Ordering Information

Adapter Number	Inlet Connection	Outlet Connection	A. Wrench Hex Flats	B. Approximate Effective Length
7572C-14A	¾" M. NPT	¾" F. NPT	1⅜"	1"
7572C-15A		¾" M. NPT		¼"



**7572C-15A**  
For Globe and Angle Valves



## Double-Check Filler Valves

### General Information

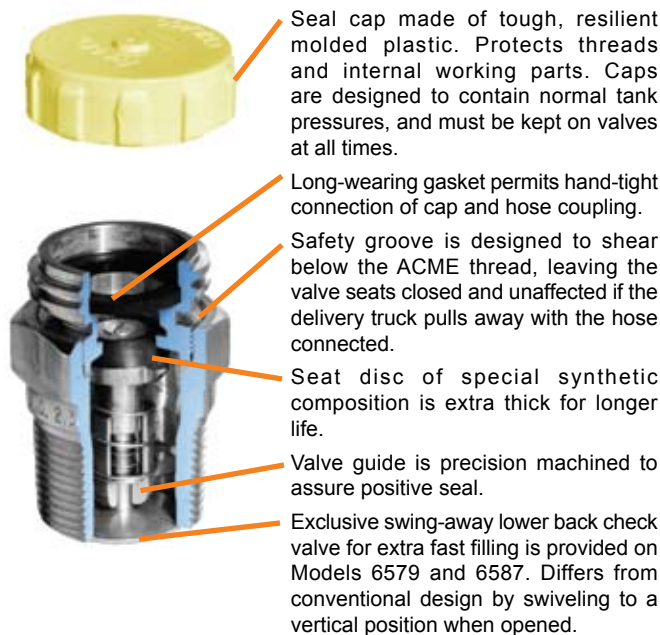
RegO® Double-Check Filler Valves incorporate a resilient upper check valve, normally designated as a filler valve, and a lower check valve, commonly called a back pressure check valve. Available in a range of sizes to cover virtually all LP-Gas storage containers, these valves are UL listed and meet 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 Large Motor Fuel and ASME Tanks 6579 Series and 7579 Series

### Application

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.

### Features

- Double back check provides added system protection.
- Upper filler valve assembly can be easily replaced without evacuating the container.
- Both checks are spring actuated for quick, precise closure when flow into the valve stops or reverses.
- 6579 Series swing-away check promotes faster filling for more profitable operations.
- Specify RegO® Filler Valves on all your original tank purchases to insure quality and dependable performance.



### Materials

Upper Body.....	Brass
Lower Body.....	Brass
Springs.....	Stainless Steel
Washer and Seat Disc.....	Synthetic Rubber
Cap.....	Plastic



### Ordering Information

Part Number		A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)				
Cap Only	Cap, Chain and Ring					5 PSIG	10 PSIG	25 PSIG	50 PSIG	75 PSIG
7579	7579C	1¼"	1¼"	1½"		50	70	111	157	192
7579P	-		1¼"			37	52	82	116	142
6579**	6579C**		1¼"			78	110	174	246	301

\* Incorporates ¾ F. NPT dip pipe connection

\*\* Swing-away lower back check valve design for higher filling rate. NOTE: Multiply flow rate by .94 to determine liquid butane capacity.

# Double Check Filler Valves for Forklift, Motor Fuel and RV Tanks 7647 Series

## Application

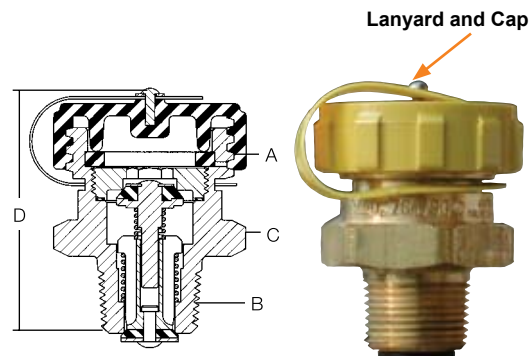
Designed to provide fast filling of forklift, motor fuel, and recreational vehicle tanks.

## Features

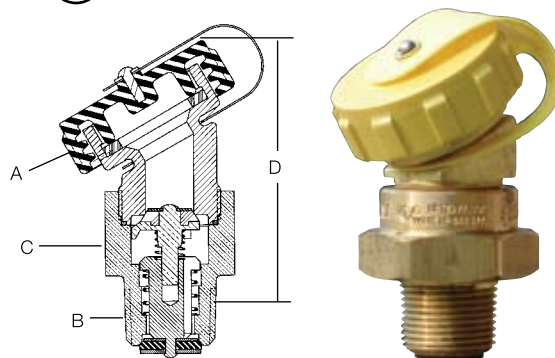
- Resilient seat disc in lower check designed to provide a gas tight seal without leakage.
- Double back check provides added system protection.
- 7647SA has 30° angle on hose connection. Makes connection and disconnection easier for certain engine fuel applications.
- Large 13/4" wrench flats on 7647SC allow use of socket wrench for easy installation.
- Specify RegO® Filler Valves on all your original tank purchases to insure quality and dependable performance.

## Materials

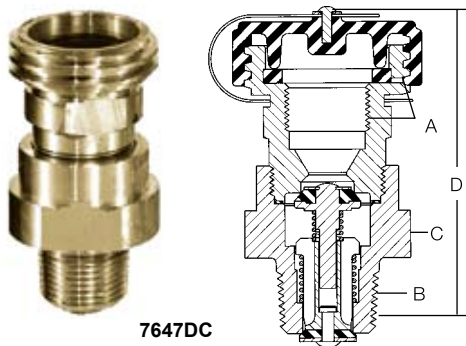
Upper Body..... Brass  
Lower Body..... Brass  
Springs..... Stainless Steel  
Washer and Seat Discs..... Resilient Synthetic Rubber  
Cap..... Plastic



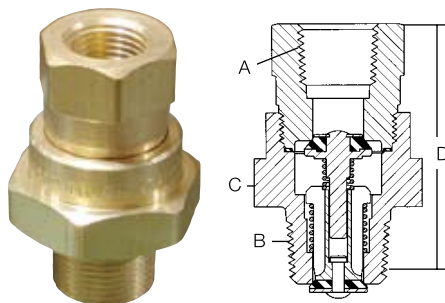
7647SC



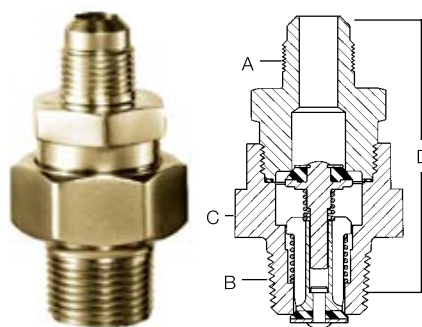
7647SA



7647DC



7647H



7647HF



## Ordering Information

Part Number		A Hose Connection	B Tank Connection M. NPT	C Wrench Flats	D Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)***				
Basic	w/Lanyard and Cap					10 PSIG	20 PSIG	30 PSIG	40 PSIG	50 PSIG
7647H	-	½" F. NPT	¾"	1½"	2⅞"	14	20	24	27	50
7647HF	-	½" SAE Flare			2⅝"					
-	7647DC	1¾" ACME & F. POL			3"					
-	7647SA**	1¾" ACME			3⅛"					
-	7647SC*			1¾"	2¼"*					

\* Large 1 3/8" hex wrench flats.

\*\* 30° angle on 1-1/4" ACME hose connection.

\*\*\* 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

## Application

Designed to provide fast filling of bobtails, transports and large bulk storage tanks.

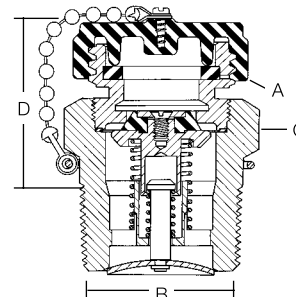
The 6587EC incorporates a swing-away lower check which greatly reduces pressure drop across the valve. This lower pressure drop promotes faster filling rates and greater efficiency resulting in more profitable operations.

## Features

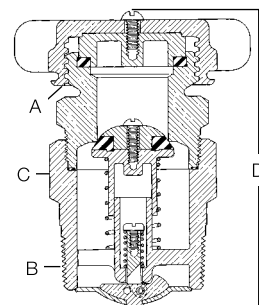
- Double back check provides added system protection.
- Upper filler valve assembly can be easily replaced without evacuating the container.
- Both checks are spring actuated for quick, precise closure when flow into the valve stops or reverses.
- 6587EC swing-away check promotes up to 65% faster filling rates for more profitable operations. Faster filling rates add longer pump life by reducing chances of cavitation.
- Specify RegO® Filler Valves on all your original tank purchases to insure quality and dependable performance.

## Materials

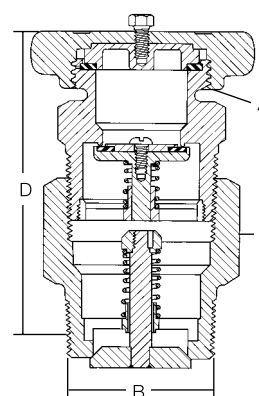
Upper Body.....	Brass
Lower Body (7579S and 6587EC).....	Brass
Lower Body (3197C).....	Brass
Springs .....	Stainless Steel
Washer and Seat Discs .....	Synthetic Rubber
Cap (6587EC and 3197C).....	Brass
Cap (7579S).....	Plastic



7579S



6587EC



3197C

## Ordering Information

Part Number	A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)				
					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 3/4"	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

## Application

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.

## Features

- Specifically for use with RegO® Back Check Valves.
- 6584C stem assembly reduces turbulence during filling and promotes higher filling rates.
- Specify RegO® Filler Valves on all your original tank purchases to insure quality and dependable performance.

## Materials

Upper Body.....	Brass
Lower Body .....	Brass
Springs .....	Stainless Steel
Washer and Seat Discs .....	Synthetic Rubber
Cap (3194C, 6584C) .....	Brass
Cap (3174C).....	Plastic



3174C



3194C, 6584C

## 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 3/8"	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.



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

ACME	Part Number
1 1/4"	A2797-20R
1 3/4"	A2697-20R

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

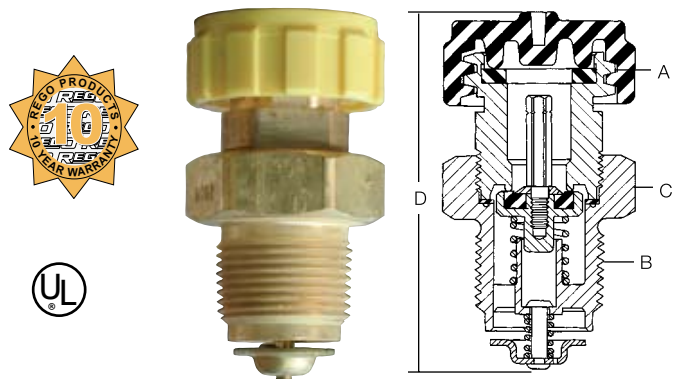
### Application

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.

### Features

- Double check provides added system protection.
- Upper back check valve can be easily replaced without evacuating the container
- Specify RegO® Vapor Equalizing Valves on all your original tank purchases to insure quality and dependable performance.



7573 Series

### Materials

Body .....	Brass
Spring .....	Stainless Steel
Upper Check Seat Disc .....	Synthetic Rubber
Seals .....	Synthetic Rubber
Cap .....	Plastic

### Ordering Information

Part Number		A. ACME Hose Connection	B. Tank Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Approx. Closing Flow at 100 PSIG Inlet Pressure (SCFH/Propane)
Basic	W/ Chain & Cap					
7573D	7573DC	1 1/4"	3/4"	1 1/4"	2 1/16"	4,100
-	3183AC	1 3/4"	1 1/4"	2"	3 1/16"	10,000

## Single Check Vapor Equalizing Valves for ASME and DOT Containers with Supplementary Excess Flow Valves

### Application

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.

### Features

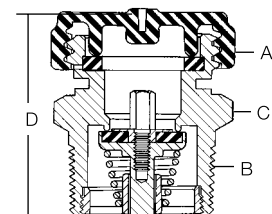
- Specifically for use with RegO® Excess Flow Valves.
- Specify RegO® Vapor Equalizing Valves on all your original tank purchases to insure quality and dependable performance.

### Materials

Body .....	Brass
Spring .....	Stainless Steel
Seat Disc .....	Synthetic Rubber
Seal .....	Synthetic Rubber
Cap .....	Plastic



3170



### Ordering Information

Part Number		A. Inlet Connection	B. Outlet Connection	C. Wrench Hex Flats	D. 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	-	1 1/4"	3/4"	1 1/4"	1 1/16"	7,600	3272E
-	3180C	1 3/4"	1 1/4"	1 1/4"	1 11/16"	10,000	3282A

# Back Pressure Check Valves

## General Information

RegO® Back Pressure Check Valves are designed to allow flow in one direction only. The check, normally held in the closed position by a spring, precludes the possibility of flow out of the container. When flow starts into the container, the pressure overcomes the force of the spring to open the check. When the flow stops or reverses, the check closes.

Metal-to-metal seats will allow slight leakage after closure. These valves will restrict the escape of container contents in the event of accidental breakage of the piping or fittings.

## Back Pressure Valves for Container or Line Applications 3146 Series, 3176 Series, A3186, A3187S, A3196, and A3276BC

## Application

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.

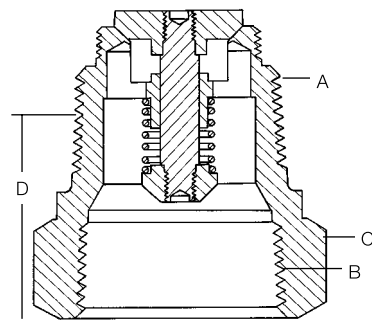
When used with the appropriate single check filler valve, the combination forms a double check filler valve suitable for use in filling of bulk storage tanks.

## Features

- Generous flow channels for low pressure drop.
- Heavy-duty construction for long service life.
- Soft seat valves have synthetic rubber seat disc for positive seals.

## Materials

Body (3146, 3146S, 3176)	Brass
Body (all others)	Cadmium Plated Steel
Disc (3146, 3146S, 3176)	Brass
Disc (all others)	Cadmium Plated Steel
Stem (3146, 3146S, 3176)	Brass
Stem (A3146, A3196, A3276BC)	Stainless Steel
Stem (A3176, A3186)	Cadmium Plated Steel
Spring	Stainless Steel
Seat Disc (3146S, A3276BC)	Synthetic Rubber



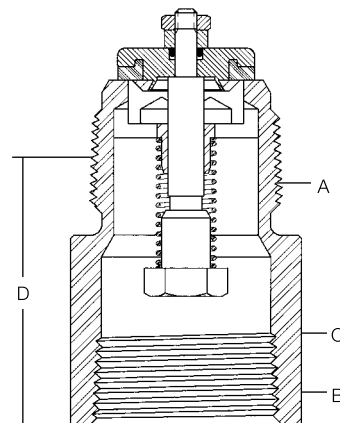
3146 Series, 3176 Series, A3186, A3196



A3187S



A3276BC



## Ordering Information

Part Number		A Inlet Connection F. NPT	B Outlet Connection M. NPT	C Wrench Hex Flats	D Effective Length (approx.)	Propane Liquid Capacity at various differential pressures (GPM)			
Brass	Steel					5 PSIG	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"	2"	2 7/8"	2 7/16"	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

\*Soft seat version.

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



# Swing-Away Back Pressure Check Valves for Container or Line Applications 6586D and A6586D

## Application

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.

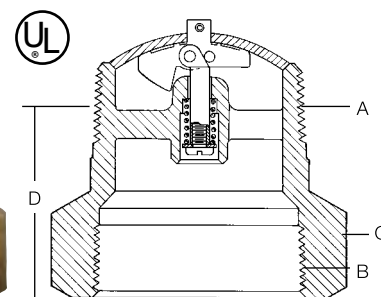
## Features

- Swing-away check design offers faster flow rates.
- Heavy-duty construction for long service life.



## Materials

Body (6586D)	Brass
Body (A6586D)	Steel
Disc (6586D)	Brass
Disc (A6586D)	Stainless Steel
Stem Assembly	Stainless Steel
Spring	Stainless Steel
Screw	Stainless Steel



6586D

## Ordering Information

Part Number		A. Inlet Connection F. NPT	B. Outlet Connection M. NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	Propane Liquid Capacity at Various Differential Pressures (GPM)			
Brass	Steel					5 PSIG	10 PSIG	25 PSIG	50 PSIG
6586D	A6586D	2"	2"	2 1/4"	2 7/16"	190	270	420	600

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

# Back Pressure Check Valves for Flanged Installation A3400L4 and A3400L6

## Application

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.

## Features

- Speeds up filling operations in bulk tanks.
- All steel and stainless steel construction assures long service life.

## Materials

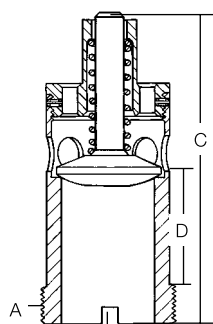
Body	Cadmium Plated Steel
Stem	Stainless Steel
Spring	Stainless Steel
Disc	Cadmium Plated Steel
Guide	Stainless Steel
Roll Pin	Stainless Steel

## Ordering Information

Part Number	A. Flange Connection M. NPT	B. Wrench Hex Flats	C. Overall Length	D. Threaded End To Port	Propane Liquid Capacity at Various Differential Pressures (GPM)			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A3400L4	2"	Slotted	5 1/4"	1 5/16"	223	316	500	707
A3400L6	3"		5 5/8"	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.

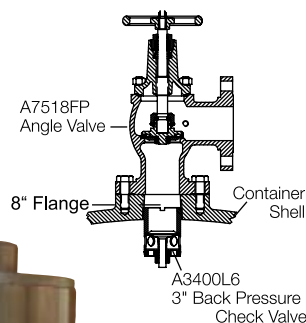
## F26



A3400L6



Typical high capacity filling installation for large storage containers



# Warning Notice

The following warning information, Part Number 903-500, is included with each shipment of Excess Flow, Check, Filler and Vapor Equalizing Valves to the first purchaser of the product from the factory.

This information is intended to be forwarded throughout the product distribution chain. Additional copies are available from Engineered Controls International, Inc. and Authorized Product Distributors.

These adhesive warning labels are intended for application as close as possible to the Chek-Lok® once the Chek-Lok® is installed.

The basic information contained on the label is intended for the benefit of the user of the Chek-Lok® and is not intended to be an "all-inclusive" product warning.

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

Part Number	Description
7572-400	Adhesive Warning Label

## DANGER READ THIS FIRST WARNING

### LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

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

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

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

Know and understand NFPA Pamphlet 58 "Liquefied Petroleum Gas Code", which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Following its requirements is essential in the safe use of LP-Gas. Section 15 states that "In the interest of safety, all persons employed in handling LP-Gases shall be trained in proper handling and operating procedures."

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

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

Install valves by applying force to wrenching flats only.

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

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

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

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

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

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

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

In selecting a label for posting at the installation site, consider ECII® part number 901-400 or 903-400 along with your own, NFPA's and others.

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

Engineered Controls International, Inc., ECII® requests that this information be forwarded to your customers. Additional copies are available from ECII® and your authorized ECII® Product Distributor.

**ECII® Engineered Controls International, Inc.**

Printed in USA 07-0203-0686  
Part number 903-500

100 RegO Drive PO Box 247 Elon, NC 27244 USA Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

## DANGER WARNING

### LP-GAS IS EXTREMELY FLAMMABLE AND EXPLOSIVE

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

#### CAUTION!

Use this CHECK-LOK® connection only for liquid evacuation before moving tank in accordance with NFPA Pamphlet 58, which is the law in many states. This publication is available from NFPA, Batterymarch Park, Quincy, MA 02269. Read and follow ECII® product instruction number 7572FA-301.

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

ADDITIONAL SAFETY INFORMATION IS AVAILABLE FROM

**ECII® Engineered Controls International, Inc.**

Printed in U.S.A. 03-0994-1189  
Part No. 7572-400

100 RegO Drive PO Box 247 Elon College, NC 27244 USA Phone (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

## Cross Reference by Part Number

12472	F11	A3292C	F11
A1519A2	F10	A3400L4	F26
1519A2	F10	A3400L6	F26
1519A3	F10	A3500L4	F14
A1519A4	F10	A3500N4	F14
1519A4	F10	A3500P4	F14
A1519A6	F10	A3500R6	F14
A1519B4	F10	A3500T6	F14
1519B4	F10	A3500V6	F14
1519C2	F9	6579	F20
1519C4	F9	6584C	F23
A2137	F13	A6586D	F26
A2137A	F13	6586D	F26
2139	F13	6587EC	F22
2139A	F13	A7537L4	F12
A2697-20R	F20	A7537L4F	F12
A2697-20R	F23	A7537N4	F12
2723C	F15	A7537N4F	F12
A2797-20R	F20	A7537P4	F12
A2797-20R	F23	A7537P4F	F12
2884D	F16	A7539R6	F12
3146	F25	A7539R6F	F12
A3146	F25	A7539T6	F12
3146S	F25	A7539T6F	F12
3170	F24	A7539V6	F12
3174C	F23	A7539V6F	F12
3176	F25	7572-400	F27
A3176	F25	7572C-14A	F19
3180C	F24	7572C-15A	F19
3183AC	F24	7573D	F24
A3184-8R	F20	7573DC	F24
A3186	F25	7574	F11
A3194-8R	F20	7574L	F11
3194C	F23	7579	F20
A3196	F25	7579P	F20
3197C	F22	7579S	F22
3199W	F16	7590U	F18
3272E	F11	7590U-10	F19
3272F	F11	7590U-20	F18
A3272G	F11	7591U	F18
3272G	F11	7647DC	F21
A3276BC	F25	7647H	F21
3282A	F11	7647HF	F21
3282B	F11	7647SA	F21
A3282C	F11	7647SC	F21
3282C	F11	A8013D	F15
A3292A	F11	A8013DA	F15
3292A	F11	A8013DB	F15
A3292B	F11	A8523	F12
3292B	F11	A8525	F12