



LP-Gas & Anhydrous Ammonia Equipment

ECII *Engineered Controls
International, Inc.*

Section J

Miscellaneous Equipment (Including Rotogages and ESVs)

J

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.

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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 (NH₃). The following points are important to know for proper use of the catalog:

1. Illustrations and drawings of individual products are representative of "product groups" and all products within a product group are similar in construction.
2. Materials used for construction of products in this catalog are suitable for rated service pressure at temperatures of -40° F. to +165° F., unless otherwise specified.
3. Products in this catalog are only intended for use in LP-Gas and/or anhydrous ammonia service as follows.
 - a. "A" or "AA" prefix — Products with this prefix are suitable for NH₃ service (i.e., contain no brass parts).
 - b. "AA" prefix on relief valves — These valves are NOT suitable for use with LP-Gas service. These are of partial aluminum materials and are listed by Underwriters Laboratories (UL) for NH₃ service only.
 - c. All other products are suitable for use with LP-Gas service.
 - d. "SS" prefix—Hydrostatic relief valve with this prefix are suitable for NH₃ 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 NH₃. 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.

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1" Rotogages® for Large Mobile and Stationary Containers 9090 and AA9090 Series

Application

Rotogages® are designed to provide an accurate determination of LP-Gas or anhydrous ammonia container contents. They mount in a standard 1" NPT coupling on large mobile or stationary containers.

To operate the Rotogages®, the vent valve is opened and the dip tube rotated slowly from the container vapor space to the liquid space. The difference in appearance of the discharge indicates when the liquid level is reached. Dial readings then indicate the percentage of product in the container.

Features

- Supported design (TS Models) eliminates whipping and the need for internal support hangers.
- Resistance-free nylon bearing inserts reduce friction and promote operating ease.
- Dial face is dual calibrated to provide greater accuracy in reading contents in containers which are not level.
- Interchangeable accessory dials permit interchangeable service between LP-Gas and anhydrous ammonia.



Rotogage® Assembly

Materials

Body	Steel
Stem	Steel
Dip Tube	Seamless Steel
Indicator	Malleable Iron
Dial Plate	Aluminium
Vent Stem	Stainless Steel



A9091-18LX



Rotogage® Dials

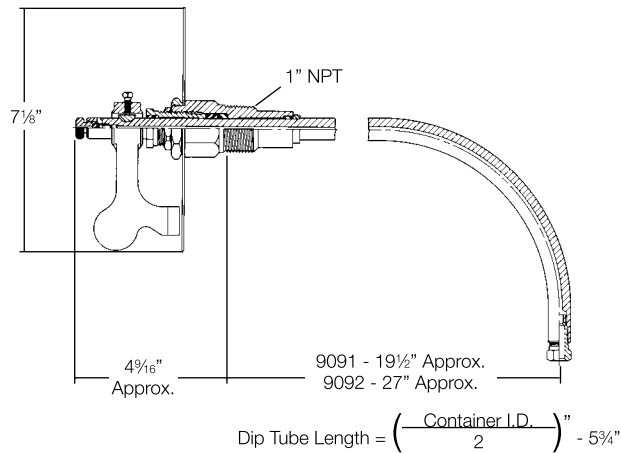
Ordering Information

Part Number	Service	Container Size
A9091-18L	LP-Gas	All Sizes
A9091-18LX*	LP-Gas	Over 1200 U.S. gallons
A9091-18N	NH3	All Sizes

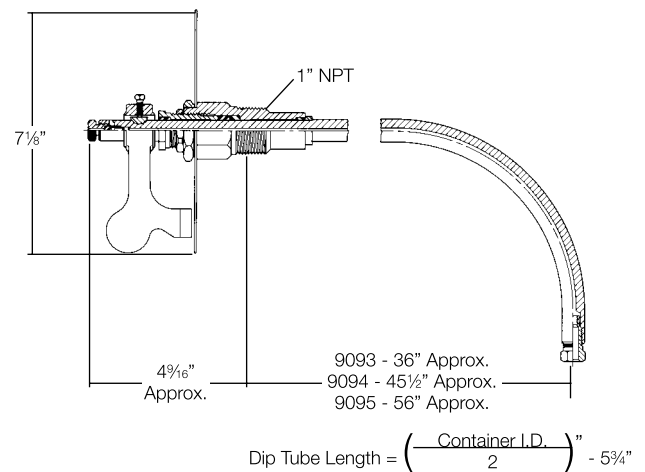
* Dial permits higher filling level, as per NFPA 58, (1983) Par. 4-5.2.1, Table 4-5.2.1

1" Rotogages® for Large Mobile and Stationary Containers

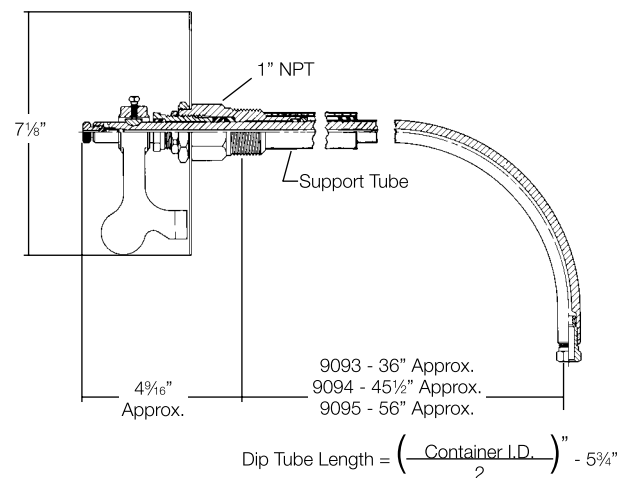
For Small Mobile or Stationary Containers 9091RM and 9092RM Series





For Large Stationary Containers 9093RSM, 9094RSM and 9095RSM Series



For Large Mobile or Stationary Containers 9093TSM, 9094TSM and 9095TSM Series



Ordering Information

Part Number				For Container Inside Diameter			
For Use With LP-Gas		For Use With NH ₃					
				Ellipsoidal Heads		Hemispherical Heads	
For Mobile or Stationary Containers	For Stationary Containers Only	For Mobile or Stationary Containers	For Stationary Containers Only	Side Mounted	End Mounted	Side Mounted	End Mounted
9091RM24	-	AA9091RM24	-	30" - 45"	30" - 75"	30" - 45"	30" - 45"
9092RM36	-	AA9092RM36	-	46" - 61"	76" - 108"	46" - 61"	46" - 61"
9093TSM48*	9093RSM48	AA9093TSM48*	AA9093RSM48	62" - 79"	109" - 147"	62" - 79"	62" - 79"
9094TSM60*	9094RSM60	AA9094TSM60*	AA9094RSM60	80" - 99"	-	80" - 99"	80" - 99"
9095TSM72*	9095RSM72	AA9095TSM72*	AA9095RSM72	100" - 147"	-	100" - 147"	100" - 147"

* Supported Design

NOTE: The dip tube must be cut to the required length (1/2" of container inside diameter minus 5 3/4").

3/4" Rotogages® for Small Stationary and Mobile LP-Gas Containers 2070 Series

Application

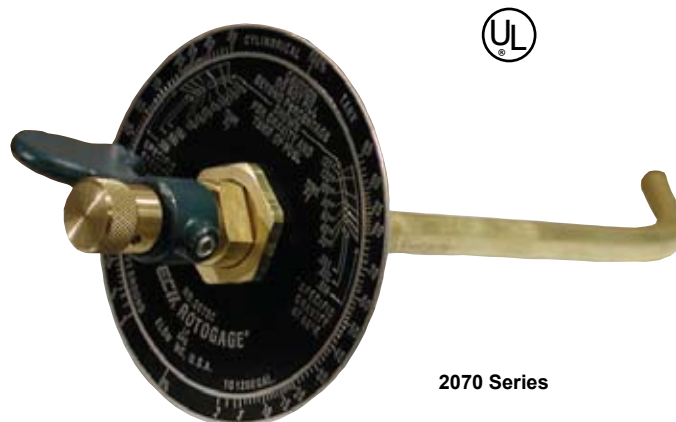
Rotogages® are designed to provide accurate determination of LP-Gas container contents. They may be end or side mounted in a standard 3/4" NPT coupling on stationary or mobile containers. To guarantee accurate measurement, they should not be used on stationary containers that exceed 60" I.D. or on mobile containers, subject to vibration, with an I.D. of more than 24".

Features

- Provides long, trouble-free performance and ease of operation.
- Polished stems assure bind-proof operation.
- Dial face is dual calibrated to provide greater accuracy in reading contents in containers which are not level.

Materials

Body Brass
Stem Brass Tubing
Dip Tube Seamless Brass Tubing
Dial Plate Aluminium
Indicator Malleable Iron

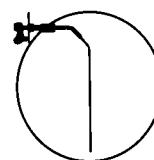


2070 Series

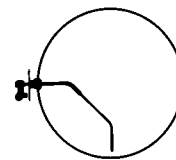
2070 Series Rotogage® Mounting Positions



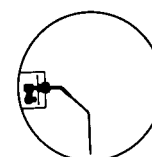
End at Center Line



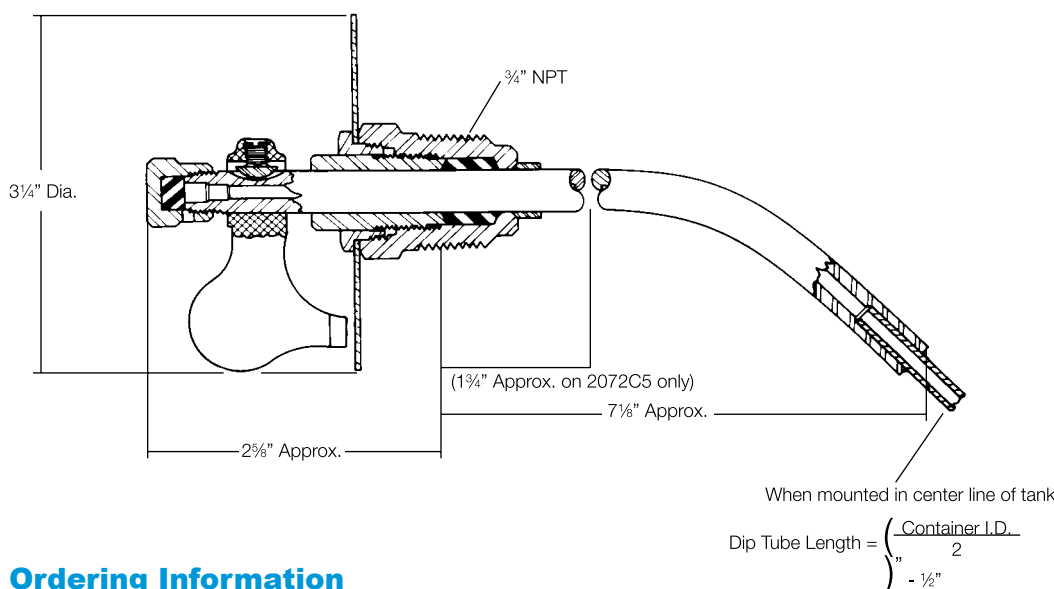
Side at Maximum Filling Level



Side at Center Line



Recessed in Side at Center Line



Ordering Information

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

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

Pull-Away Valves for Transfer Operations

A2141 Series

Application

Designed especially to provide pull-away protection for LP-Gas and anhydrous ammonia transfer operations including transport and delivery truck loading and unloading, engine fuel container filling and miscellaneous cylinder filling operations. When properly fastened to the inlet end of the discharge hose, the valve is designed to stop gas escape from both upstream and downstream lines in the event of a pull-away. An excessive tension pull causes the valve to automatically separate, closing two internal back pressure checks. Only a few cubic centimeters of gas escape at the instant of separation.

It is recommended that a convenient means be provided to safely remove the pressure from the line upstream of each coupling half to enable reassembly of the valve. To reassemble, simply push the male half firmly into the female half until the retaining balls slip into the retaining groove. Check for leaks after reassembly.

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

If the A2141 pull-away valve is going to be stored for a period of time, A2141 Series such as in seasonal applications, it is recommended that it be sprayed with a good grade of rust-preventive machine oil, and covered to protect it from moisture.

Materials

Body (3/4", 1")..... Cadmium Plated Steel
Body (1 1/4", 2")..... Aluminum
Seals..... Buna-N Rubber
Cables Nylon Coated, Galvanized Steel



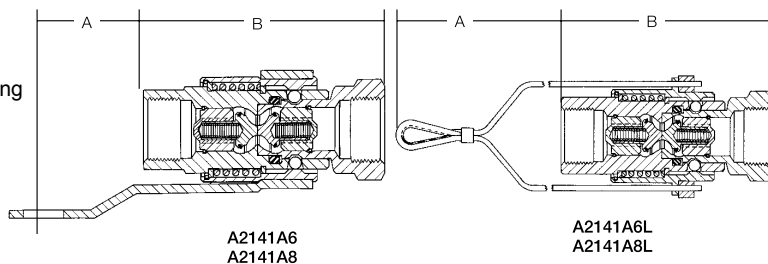
A2141A6



A2141A10

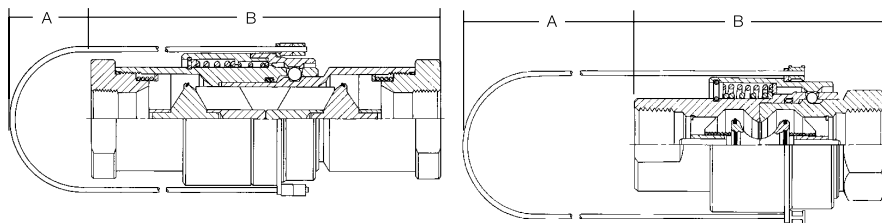
Features

- Heavy-duty construction for long service life.
- A "true" pull-away type valve which simply reconnects by snapping together without unnecessary downtime or need for new parts.
- Buna-N seals provide leak tight operation.
- 400 PSIG operating pressure.



A2141A6
A2141A8

A2141A6L
A2141A8L



A2141A16

A2141A10



Ordering Information

Part Number	Inlet/Outlet Connections NPT F.	Disconnect Force Approx.-lbs	Reconnect Force Approx.-lbs	Length Of Valve	LP-Gas Liquid Flow Capacity at Various Differential Pressures (GPM)*			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A2141A6	3/4"	130	80	3 3/8"	11	16	25	36
A2141A6L**								
A2141A8	1"	75	50	4 5/16"	21	30	47	67
A2141A8L**								
A2141A10	1 1/4"	160	25	5 5/8"	52	75	120	170
A2141A16	2"	300	50	14 5/16"	250	350	550	750

* To Determine NH₃ liquid flow capacity, multiply by .90.



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LP-Gas Emergency Shut-Off Valves (ESV's)

Why and how they should be used for Bobtail Filling and Transport Unloading.

General Information

The primary purpose of Emergency Shut-Off Valves in bobtail filling and transport unloading is to allow quick shut-off of liquid and vapor flow in the event there is an accidental pull-away of a truck or a hose rupture, both of which could cause a fire.

A system using Emergency Shut-Off Valves will not prevent some spillage of liquid and vapor, but the total system should be constructed so this spillage will be kept to a minimum.

This can be accomplished either by making possible, quick action by the driver or plant personnel in closing the valves by manual remote or pneumatic remote actuation; or in case of a pull-away, by automatic closing of the liquid valve by means of a cable connected to the liquid hose.

By minimizing the presence of liquid and vapor, the chance of a fire or explosion will be reduced. In case of a fire, thermal links at the valves or at other appropriate locations could close the valves and prevent further release of liquid and vapor.

The valve closing systems will be discussed later in this section. The user should decide which system is most appropriate, depending on the piping configuration and the general layout of the filling/unloading area.

ESV Application for Bobtail Loading and Transport Unloading

A very important function of the typical LP-Gas storage plant is to transfer LP-Gas into bobtails for delivery to customers. How efficiently and rapidly these bobtails can be filled often determines the number of customers that can be served each day, as well as how many bobtails are required to satisfactorily serve all customers. Therefore, the selection of an ESV for the bobtail liquid loading line should be done with care so as to maximize efficiency in filling and have year-round dependability.

The RegO® 2" liquid ESV (7605B) has a full open port so that the restrictions of flow would be no more than you would expect through an equivalent length of 2" schedule 80 pipe. To improve the overall efficiency of the system, the valve was also designed as an operating valve so it could replace an existing globe or angle valve already installed at the end of the fixed piping. Thus, installing a RegO® ESV could actually result in a more efficient pumping operation than the existing system.

Equally important in the consideration of an ESV is its performance in an emergency, especially bobtail pull-aways. According to the NPGA, it is the bobtail filling transfer process that produces almost 99% of all bulk plant accidents and fires. Therefore, when selecting the proper ESV for bobtail filling, also consider the dependability of performance, and simplicity of operation and maintenance.

The RegO® ESV clearly indicates to the operator its open or closed position. It allows full manual control by the operator and provides means for remote operation in emergencies from either in front of the valve or in the rear.

No complicated systems of pulleys and cables are necessary since direct, straight pulls will close the valve. Means are even provided to secure a length of cable to the transfer hose so as to produce an automatic closing in the event the driver pulls away without disconnecting the hose.

NFPA Provisions (1986)

The pertinent provisions of NFPA Pamphlet 58, as they apply to Emergency Shut-Off Valves and how they are to be installed, are as follows:

Section 2-4.5.4 Emergency shutoff valves shall be approved and incorporate all the following means of closing:

(a) Automatic shutoff through thermal (fire) actuation. When fusible elements are used they shall have a melting point not exceeding 250° F. (121° C).

(b) Manual shutoff from a remote location.

(c) Manual shutoff at the installed location.

This provision sets for the basic criteria for the emergency shutoff valve, a key valve in the protection of many liquid transfer operations. Actuating means for remote control may be electrical, mechanical or pneumatic.

Many systems use a pneumatic system where the tubing itself acts as a fusible element releasing the pressure holding the valve open. With respect to the feature of manual shutoff at the installed location, it is recommended that this valve be operated occasionally. Also, the system should be tested periodically to determine that it will function properly.

Section 3-2.7.9 on new installations, and by December 31, 1980 on existing installations, (1) stationary single container systems of over 4,000 gal. (15.1 m³) water capacity, or (2) stationary multiple container systems with an aggregate water capacity of more than 4,000 gal. (15.1 m³) utilizing a common or manifolded liquid transfer line, shall comply with 3-2.7.9 (a) and (b).

(a) When a hose or swivel type piping 1 1/2" or larger is used for liquid transfer or a 1 1/4" or larger vapor hose or swivel type piping is used in this service (excluding flexible connectors in such liquid and vapor piping), and emergency shutoff valve complying with 2-4.5.4 shall be installed in the fixed piping of the transfer system within 20 ft (6m) of lineal pipe from the nearest end of the hose or swivel type piping to which the hose or swivel type piping is connected. The preceding sizes are nominal. Where the flow is only in one direction, a backflow check valve may be used in lieu of an emergency shutoff valve if installed in the fixed piping down-stream of the hose or swivel type piping, provided the backflow check valve has a metal-to-metal seat or a primary resilient seat with a secondary metal seat not hinged with combustible material. When either a liquid or vapor line has two or more hoses or swivel type piping of the sizes designated, either an emergency shutoff valve or a backflow check valve shall be installed in each leg of the piping.

(1) Emergency shutoff valves shall be installed so that the temperature sensitive element in the valve, or a supplemental temperature sensitive element [250° F. (121° C) maximum] connected to actuate the valve, is not more than 5 ft. (1.5 m) from the nearest end of the hose or swivel type piping connected to the line in which the valve is installed.

(b) The emergency shutoff valve(s) or backflow check valve(s) specified in 3-2.7.9 (a) shall be installed in the plant piping so that any break resulting from a pull will occur on the hose or swivel type piping side of the connection while retaining intact the valves and piping on the plant side of the connection. This may be accomplished by use of concrete bulkheads or equivalent anchorage or by the use of a weakness or shear fitting. Such anchorage is not required for tank car unloading.

These provisions have been interpreted by the National Propane Gas Association as to how bobtail filling and transport unloading stations should be configured. The diagrams shown here are in essential conformance with NPGA Bulletin 128-77.

LP-Gas Emergency Shut-Off Valves (ESV's)

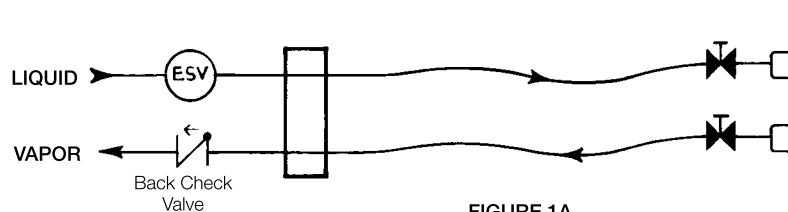


FIGURE 1A
Bobtail Filling Only

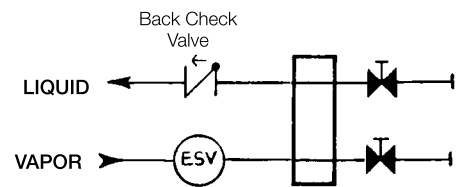


FIGURE 1B
Transport Unloading Only

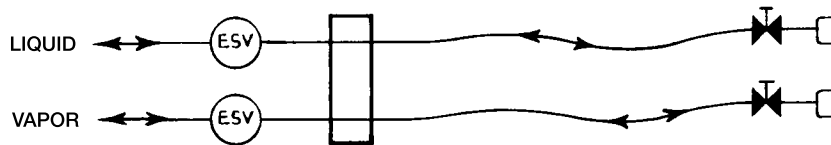


FIGURE 1C
Combined Bobtail Filling
and Transport Unloading

Installation Compliance with NFPA Requirements

A valve that is approved as an ESV may be installed in the fixed piping up to a distance of 20 feet (along the pipe) from the point where the transfer hose is attached to the fixed piping.

However, when the ESV is located more than five feet from the end of the fixed piping, an additional fusible element must be installed within five feet of the point of attachment of the hose, and be connected to the ESV valve in such a manner that it will cause the ESV to close in the event of a fire.

The ideal location of the ESV is as close to the end of the fixed piping as possible. This position eliminates the need for an additional fusible element and cable, and it may also permit the elimination of a restrictive valve already installed at the end of the fixed piping.

To this point, our comments have been principally concerned with ESV protection of the liquid line at bulk plants because this is the area of greatest potential danger in the event of a pull-away or hose rupture.

However, regulations also require an ESV in the vapor transfer line when the vapor hose is 1 1/4" or larger. A helpful rule of thumb in determining whether or not an ESV control valve is required in your

vapor system is this: If the vapor flow is out of the storage tank, an ESV is required. ESV systems are designed to protect the storage tank contents against uncontrolled release.

Therefore, a bobtail loading system could use a 1 1/4" or larger back pressure check valve in the vapor system since the flow of vapor is always from the bobtail being filled back to the storage tank. To improve transfer rates, the use of the RegO® 6586B back check valve at this location would provide protection at minimum pressure drop.

If the bobtail vapor line is also used when unloading transports, then the RegO® 7781AF ESV should be used. The 7781AF provides thermal protection, manual closing and a remote emergency closing system similar to the RegO® 2" liquid ESV, 7605B.

Remote Control Systems

Usually in transfer loading operations, the valve handles and cables are located in close proximity to the area of greatest potential danger during an emergency. Therefore, each bobtail filling system or transport unloading system should have installed in it at least one readily accessible, alternate remote operating device.

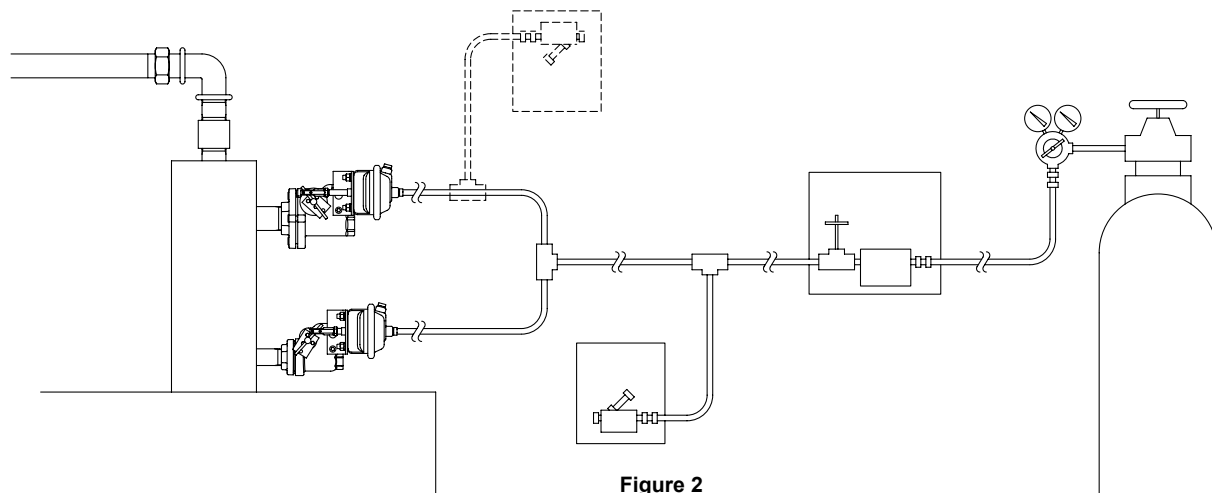


Figure 2
RegO® ESV's with Remote Pneumatic
and Transfer Hose Cable Release
Systems Typical Installation

2" & 3" Swing-Check ESVs for Bulk Plants 6016 Series and 6024 Series

Application

Designed for installation in liquid transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

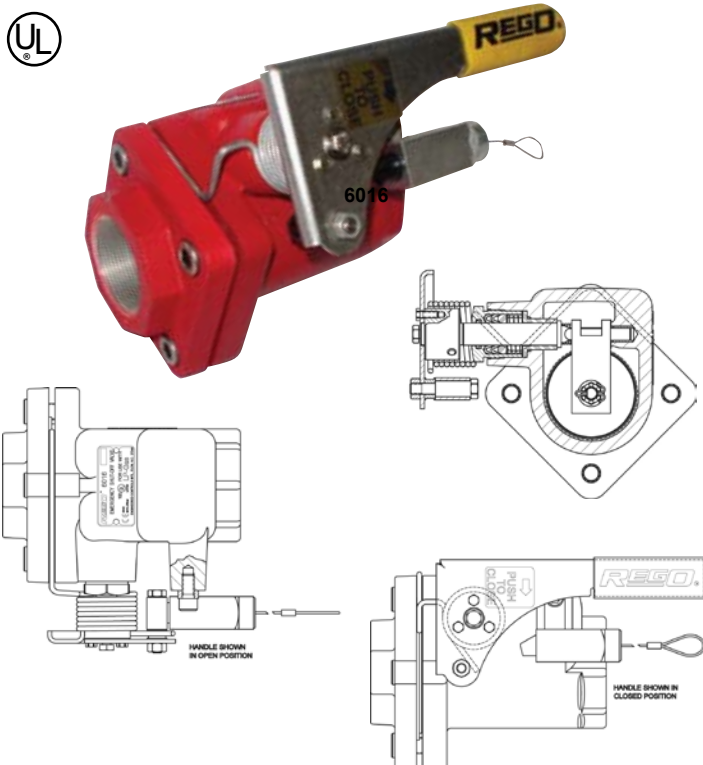
- Fusible Element is located in the thermal fuse assembly which acts at the latch open and close trigger. When exposed to fire, the element melts at 212 degrees F. allowing the shaft to return to the closed position.
- Valve can be opened by use of operating lever, if a pneumatic actuator is used it will open with the actuator.
- Valve can be closed by remote cable or pneumatic actuator.
- Valve can be closed by simply pushing the operating lever down, it is not necessary to trip the close trigger.
- Seat is metal protected to minimize leakage in case direct fire impingement.
- Straight through design allows for a liquid flow of 150 GPM (LPG) with only a 1 psig drop.
- Quick closing regardless if the pump is running or not.

Sturdy Rugged Construction

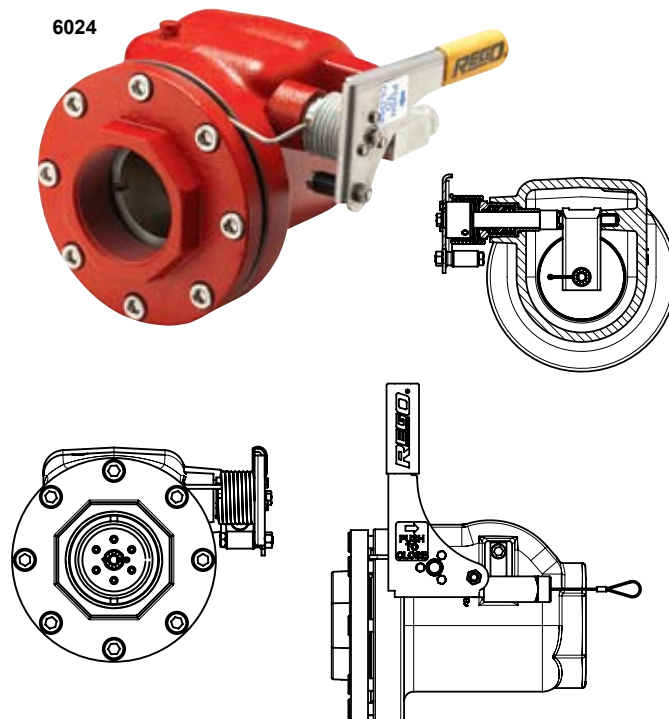
- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- 6016 is UL listed for use in LP-Gas as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.

Materials

Body Ductile Iron Cad Plated
Stem Stainless Steel
Seat Stainless Steel
Seat Disc (6016) High Temperature Viton
Seat Disc (AA6016) Synthetic Rubber
Springs Stainless Steel
Gaskets Teflon



6024



Ordering Information

Part Number	For Use With:	Inlet and Outlet Connections	Liquid Flow Capacity at 10 PSIG Drop (GPM)
6016	LP-Gas	2" F-NPT	711 (LP-Gas)
AA6016	NH ₃	2" F-NPT	640 (NH ₃)
6024	LP-Gas	3" F-NPT	1325 (LP-Gas)
AA6024	NH ₃	3" F-NPT	1173 (NH ₃)

1¼" Swing-Check ESV for Bulk Plants 6010 and AA6010

Application

Designed for installation in liquid or vapor transfer lines at LP-Gas or Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

Meets NFPA 58 and UL requirements

- Fusible Element is located in the thermal fuse assembly, which acts at the latch open and close trigger. When exposed to fire, the element melts at 212 degrees F. allowing the shaft to return to the closed position.
- Valve can be opened by use of operating lever, if a pneumatic actuator is used it will open with the actuator.
- Valve can be closed by remote cable or pneumatic actuator.
- Valve can be closed by simply pushing the operating lever down; it is not necessary to trip the close trigger.

Sturdy Rugged Construction

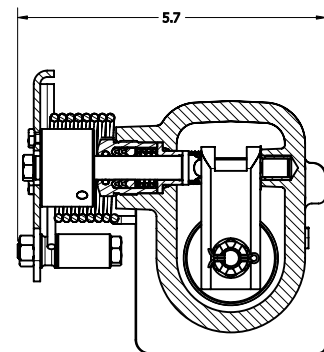
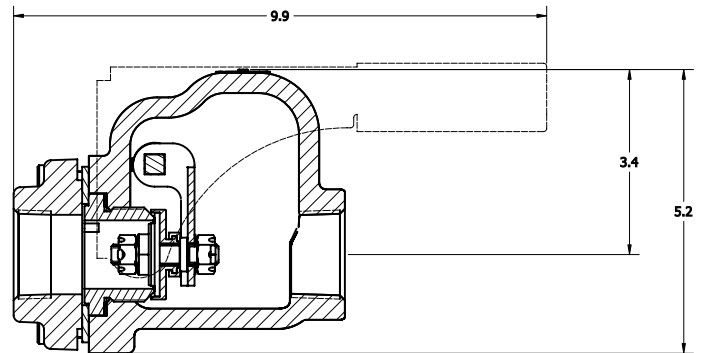
- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- **6010** is UL listed for use in LP-Gas as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.
- Seat is metal protected to minimize leakage in case direct fire impingement.
- Quick closing regardless if the pump is running or not.

Materials

Body Ductile Iron Clad Plated
Stem Stainless Steel
Seat Stainless Steel
Seat Disc High Temperature Viton (6010 only)
Seat Disc Synthetic Rubber (AA6010 only)
Springs Stainless Steel
Gaskets Teflon



6010



Ordering Information

Part Number	For Use With	Inlet and Outlet Connections	Accessories		Liquid Flow Capacity @ 10 PSIG Pressure Drop (GPM)
			Remote Pneumatic Close	Remote Pneumatic Open/Close	
6010	LP-Gas	1¼" F. NPT	6016-60D	6016-60C	259
AA6010	NH ₃	1¼" F. NPT			233

ESV Pneumatic Controls

Application

RegO® Emergency Shut-Off Valves modified for remote pneumatic shutdown operation retain all the operating features of the standard valves.

Once equipped with pneumatic cylinders and then pressurized, the pneumatic cylinder piston rod disengages from a striker plate, allowing the ESV to be manually opened and the striker plate to act as a latch and hold the valve open. Release of the control system pressure for any reason closes the ESV for fail-safe operation.

Features

Convenience

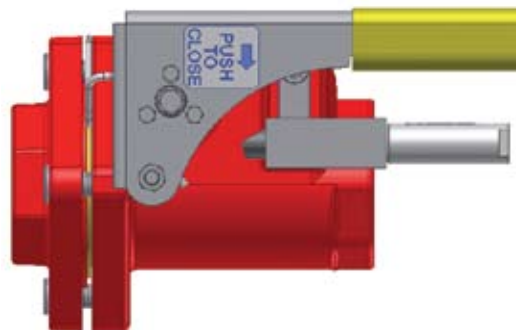
- Closes the liquid and vapor ESV from a convenient remote location.
- Independent closed loop system allows the ESV to be pneumatically charged, but opened or closed manually or with cable controls to conserve pressurized gas.

Reliability

- Independent closed loop system will continue to hold pressure and close ESV in an emergency - even if supply pressure is cut off.

Security

- Any loss of pressure from the control line, such as accidents or the line melting from fire, automatically shuts down the liquid and vapor ESV.
- ESV must be reset after automatic shutdown.



6016 with 6016-60D Remote Close Actuator



7605PN-50 Pneumatic Remote Control Kit

Control kit with components for connecting and charging the pneumatic controls from a source of compressed gas (air or nitrogen) to a RegO® liquid or vapor ESV. Includes charging valves with low pressure indicator, operating valves, 100 feet of 1/4" plastic tubing and tube fittings.



Ordering Information

Part Number	Description
7781AFPN-1	Cylinder assembly kit to convert 7781AF ESVs to pneumatic shutdown.
6016-60D	Cylinder assembly kit to convert 6016 ESVs to pneumatic shutdown.
7605PN-50	Pneumatic remote shutdown system kit, complete with 100' of tubing, fittings, 1 charging valve assembly and 1 remote shutdown valve assembly
7605APN-8A	Extra shutdown valve assembly
7605A-BT	100' roll of 1/4" pneumatic tubing.
7605AP-16	1/4" tubing tee, with nuts.
7605AP-15	1/8" NPT x 1/4" tubing, straight connector.

Hydraulic Automatic Cylinder Filling System 7194MD and 7194HD

Application

Designed to provide accurate, economical filling of LP-Gas DOT and fork lift cylinders by weight. Filling stops automatically as the total weight of the cylinder reaches the amount pre-set on the scale. One individual can efficiently handle up to four cylinder filling operations simultaneously, to maximize profits, increase efficiency and allow servicing of more customers.

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

FAIRBANKS-MORSE SCALES

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

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

HOWE SCALES

(with or without Howe No. 8325 Balance Indicator)

—No. 54X Wood Pillar and Shelf Scale.

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

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

Features

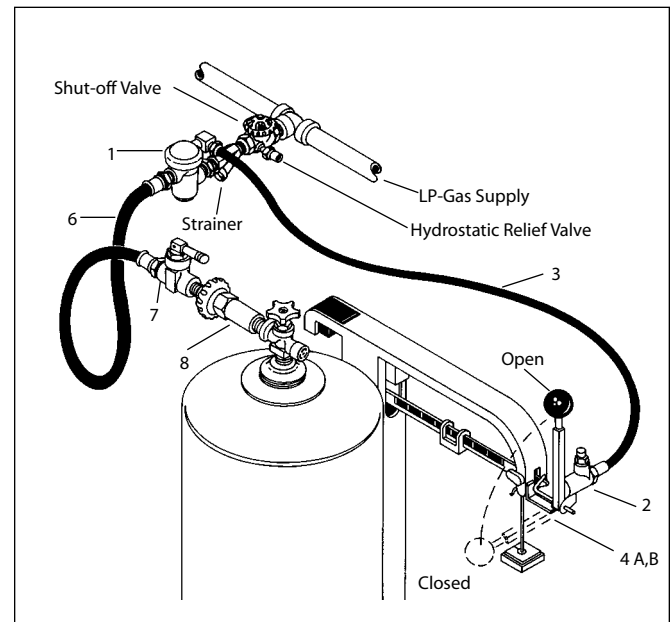
- Completely self-contained with no electrical source or wiring required.
- Works hydraulically, like brakes on a car.
- Filling stops automatically when cylinders reach pre-set weight.
- Up to four stations can be handled by one individual.

How It Works

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

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

Hydraulic self-contained system.
No external power required.



Ordering Information Hydraulic System Components

Key No.	Description	Size	Part No.
Assembly for Fairbanks-Morse. Includes items 1 thru 8 below.			7194MD
Assembly for Howe. Includes items 1 thru 8			7194HD
1	Propane Control Valve	½" NPT Female, with ⅛" NPT Female Hydraulic Connection	7177
2	Master Cylinder, with Actuator Lever	⅛" NPT Hydraulic Connection	7188
3	Hydraulic Hose Assembly	⅜" I.D. with ⅛" NPT Male Ends, 43½" Overall Length	7194-1
1-3	Valve, Cylinder and Hose Assembly for Fairbanks-Morse Scales	-	7188MS
1-3	Valve, Cylinder and Hose Assembly for Howe Scales	-	7188HS
4A	Bracket Kit for Fairbanks Morse Scales, Complete with Screws, Washers, Nuts and Instructions	-	7194M-3A
4B	Bracket Kit for Howe Scales, Complete with Screws, Washers, Nuts and Instructions	-	7194H-3
5	Can of Hydraulic Fluid, Complete with Filling Spout	1½ ounce	7188-21
6	Propane Filling Hose Assembly	½" I.D., with ½" NPT Male Ends. 50½" Overall Length	7193D
7	Quick-acting Shut Off Valve	½" NPT INlet X ¼" NPT Outlet	7901TB
8*	Soft Nose Cylinder Connector	¼" NPT Male X POL Male	7193D-10

Sight Flow Indicators for Bulk Plants A7794 and A7796

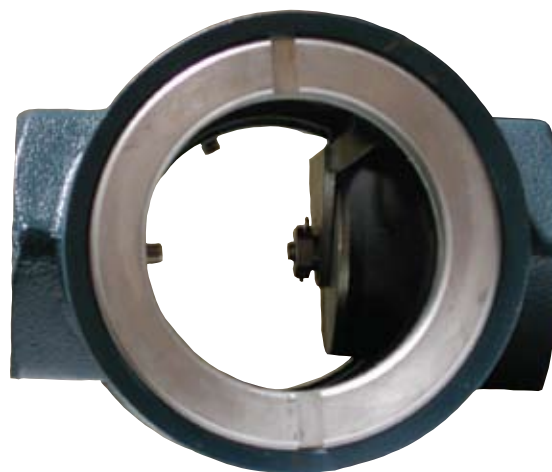
Application

Designed to promote maximum pump efficiency, these indicators enable bulk plant operators to visually inspect liquid flow conditions. With glass on both sides of the indicator, flow can be observed from either side, even under some poor light conditions. The integral swing check also serves as a back-check valve to prevent reverse flow and product loss if the hose fails in a loading operation.

By installing an indicator on the upstream side of the plant pump, suction conditions can be observed and the pump speed adjusted to obtain the maximum possible flow rate without cavitation. Additionally, if an indicator is installed in the piping at the loading rack, just ahead of the loading hose, the operator can maintain a constant check on pump conditions.

Both installations are designed to allow for observation to provide maximum pump efficiency and assure safe plant pump operation.

In compressor operations a sight flow indicator installed in the liquid line will give a visual indication when the tank car or transport is emptied. Compressor operation can then be immediately reversed to start recovery of the vapor



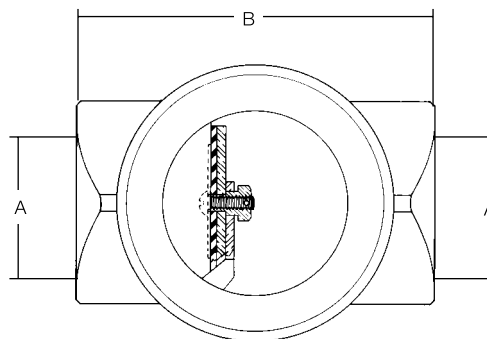
A7794

Features

- Durable ductile iron body assures long, trouble-free operation with design working pressure of 400 PSIG.
- Glass is polished, ground and tempered after fabrication for maximum strength up to 2,500 PSIG.
- Set screws minimize loosening of glass retainer rings.
- O-ring glass seals provide for leak-tight operation.

Materials

Body Ductile Iron
Swing Check..... Stainless Steel
Check Seat Disc..... Resilient Synthetic Rubber
Glass Polished, Ground and Tempered
Tested to 2,500 PSIG.



Ordering Information

Part Number	A Inlet/Outlet Connections	B Length
A7794	2" F. NPT	5 3/4"
A7796	3" F. NPT	7 3/8"

Hose End Adapters for DOT Cylinder Filling 7193D-10 and 7193U-10

Application

Designed to provide quick and easy filling of DOT cylinders with POL or Type I connections. This adapter may be used with hydraulic and electric automatic systems or with manual systems in conjunction with a RegO® 7901TB Quick Acting Shut-Off Valve.

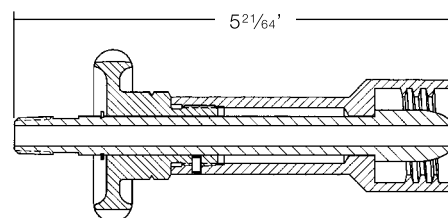
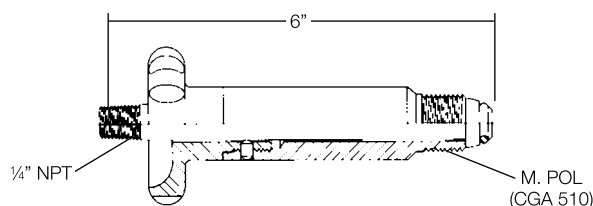
These filling connectors have an extended connection on the handwheel, which makes it possible to connect the loading hose to valves on cylinders with fixed collars. The handwheel is well outside the collar for easy operation.



7193U-10



7193D-10



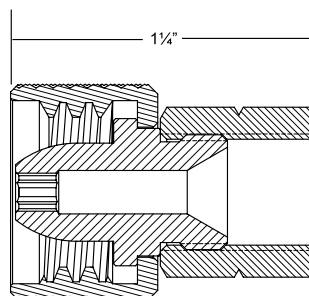
Part Number	Applications	Inlet Connection	Outlet Connection	Materials
7193D-10	Filling of DOT Cylinders with POL Connections	1/4" M. NPT	M. POL (CGA 510)	Brass & Stainless Steel
7193U-10	Filling of DOT Cylinders with Type I Connections		Type 1 Connection (1 " M. ACME)	Brass

J

Connector for DOT Cylinder Filling Adapter 7193T-10

Application

The 7193T-10 Connector is designed for use on the 7193D-10 Filling Adapters. Connector allows quick connection to the Type I 15/16 M. ACME threads for operators that fill both POL and Type I valves.



7193T-10

Ordering Information

Part Number	Applications	Inlet Connection	Outlet Connection	Materials
7193T-10	Converts 7193D-10 Adapters from POL to a Type 1 Connection	M. POL CGA 510	Type 1 Connection (1 1/16" M. ACME)	Brass

Hose End Adapter for Lift Truck Cylinder Filling 7193L-10A

Application

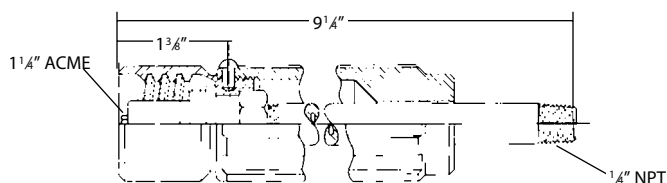
The 7193L-10A is designed to provide quick and easy attachment of the filling hose to DOT cylinders equipped with RegO® 7141M check connectors.

The 1 1/4" ACME outlet threads facilitate rapid make-up. When connected, back-checks in the adapter and check connector automatically open. Low pressure drop between the two assures high filling rates. An integral check closes when disconnected, eliminating the need to close any valves manually to disconnect the charging hose.

Because a leak-tight seal is formed before the integral check opens or closes, product loss is kept to an absolute minimum when connecting or disconnecting the loading hose.



7193L-10A



Ordering Information

Part Number	Application	Inlet Connection	Outlet Connection	Body Material	Accessories
					Adapter
7193L-10A	Filling of Fork Lift Cylinders*	1/4" M. NPT	1 1/4" F. ACME	Brass	5760A

* The 7193L-10A is intended to be permanently attached to the filling hose.

A 5760A adapter enables the 7193L-10A to be attached to the POL connection on the 7193D-10 at regulator cylinder filling stations to allow for occasional filling of fork lift cylinders.

Lever Operated Hose End Adapter for Fork Lift Cylinder Filling 7193K-10B

Application

Designed to drastically reduce labor and time when continuously filling large numbers of lift truck cylinders equipped with RegO® 7141M check connectors.

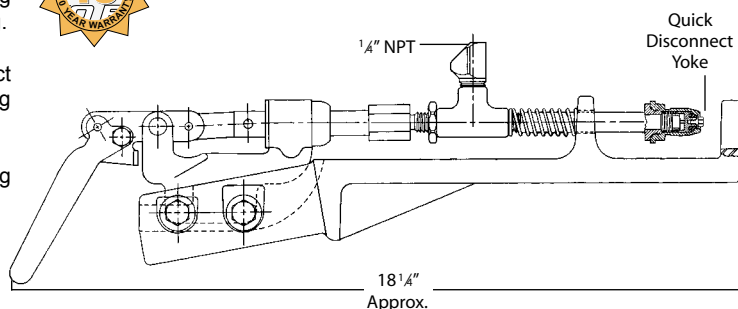
Rapid make-up is accomplished by simply slipping the adapter yoke behind the hex wrenching section of the 7141M connector and depressing the lever. When the cylinder is filled, the adapter is easily disengaged by releasing the operating lever. When connected, back checks in the adapter and connector automatically open. An integral check closes when disconnected, eliminating the need to close any valves manually on the filling manifold to disconnect the charging hose. The shut-off valve on the container must be closed after filling.

Because a leak-tight seal is formed before the checks close, product loss is kept to an absolute minimum when connecting or disconnecting the loading hose.

The 7193K-10B is intended to be permanently attached to the filling hose.



7193K-10B



Ordering Information

Part Number	Application	Inlet Connection	Outlet Connection	Materials
7193K-10B	Lever Operated for Quick Filling of Fork Lift Cylinders	1/4" F. NPT	Quick Disconnect Yoke*	Brass and Steel

* For use with RegO® 7141M check connector.

Combination Valve for Bulk Storage Containers A2805C

Application

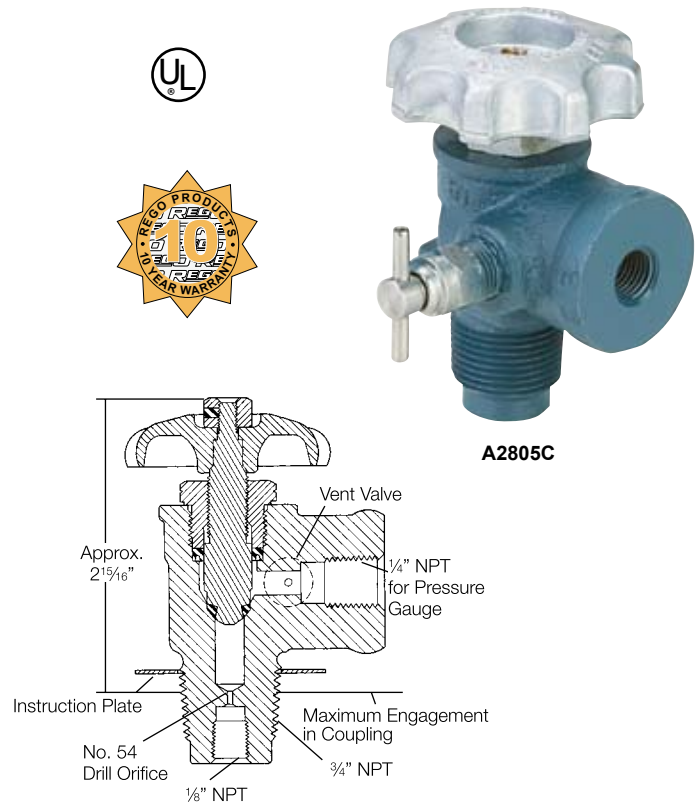
Designed for installation on bulk storage containers, this valve combines a pressure gauge mounting and provision for a fixed tube liquid level gauge.

The shut-off valve prevents the pressure gauge from being subjected to constant pressure, thereby prolonging its life and accuracy. The valve may be closed, and the vent valve opened to vent pressure from the gauge to permit replacement.

For fixed liquid level gauging, the valve can be mounted at the maximum permitted filling level. When equipped with a dip tube threaded 1/8" M.NPT, it can be installed at any convenient level.

Materials

Body 2805C.....	Brass
Body A2805C.....	Ductile Iron
Bonnet.....	Steel
Valve Stem.....	Stainless Steel
Vent Stem.....	Stainless Steel
Valve Stem Seal.....	Resilient Synthetic Rubber
Vent Seal.....	Resilient Synthetic Rubber
Valve Seat.....	Nylon



Ordering Information

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

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

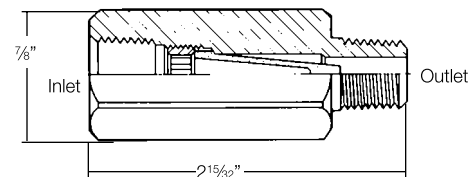
Gritrol Fuel Line Filters 12802

Application

Designed especially for use in liquid motor fuel lines to trap foreign material which otherwise may damage precision components in the LP-Gas carburetion system. These filters incorporate an integral sintered metal filter element in a straight through design.



12802



Ordering Information

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

Vent Valves 3165C, 3165S and TSS3169

Application

Especially designed to bleed off liquid or vapor pressures trapped in transfer lines. When installed in the downstream boss of RegO® globe and angle valves used at the end of a liquid transfer hose, the bleeder valve allows for the controlled venting of the product and indicates to the operator that the valves are closed and he can disconnect the coupling. They may also be used as a fixed liquid level gauge where the dip tube is part of the container.

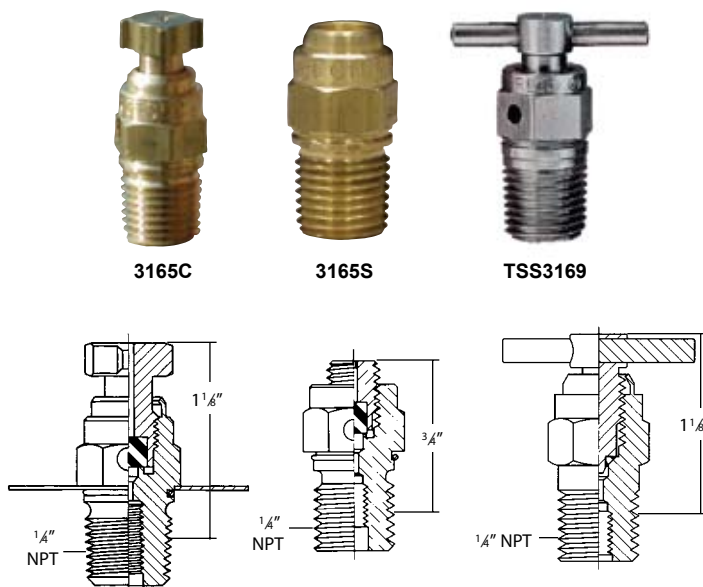
All these valves incorporate a No. 54 drill size orifice.

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

Materials



Body (3165).....	Brass
Body (TSS3169).....	Stainless Steel
Seat Disc (3165).....	Resilient Synthetic Rubber
Seat Disc (3169).....	Teflon



Ordering Information

Part Number	Service	Connection	Actuation	Accessories
				Warning Plate Kit
3165C	LP-Gas Only	1/4" M. NPT	Knurled	2550-40P
3165S			Slotted	
TSS3169	LP-Gas & NH ₃		Tee Handle	

Fixed Liquid Level Gauges 3165 Series and TA3169F

Application

Especially designed to provide a visible warning when containers are filled to the maximum permitted filling level. At the start of the filling operation, with the vent stem opened, the valve discharges vapor. When the maximum permitted filling level is reached, the valve discharges liquid. These valves are normally furnished with a 12", 3/16" O.D. dip tube and incorporate a No. 54 drill size orifice.

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



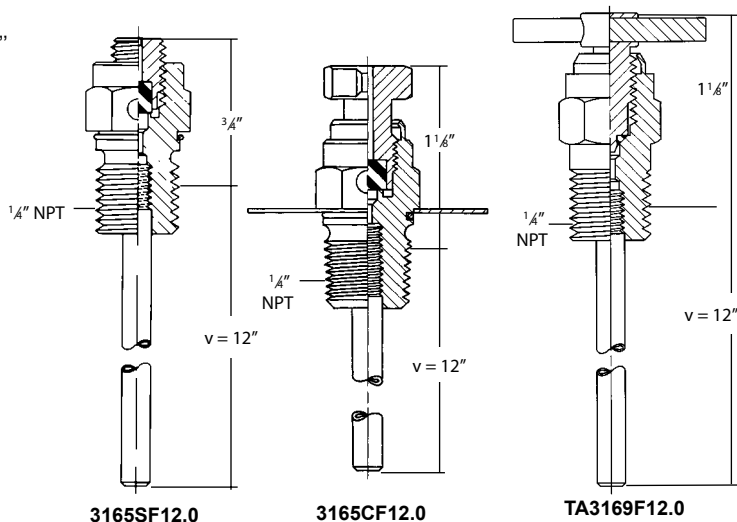
3165SF12.0



TA3169F12.0

Materials

Body (3165).....	Brass
Body (TA3169).....	Stainless Steel
Seat Disc (3165).....	Resilient Synthetic Rubber
Seat Disc (TA3169)	Teflon



Ordering Information

Part Number	Service	Connection	Actuation	Dip Tube Length	Accessories
					Warning Plate Kit
3165CF*	LP-Gas Only	1/4" M. NPT	Knurled	*	2550-40P
3165CF12.0			Slotted	12"	
3165SF12.0					
TA3169F12.0	LP-Gas & NH3		Tee Handle		

Spanner Wrench for ACME Connectors 3195-50

Application

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



3195-50



Ordering Information

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

Pressure Gauges

Application

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

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



Ordering Information

Part Number	Service	Case Material	Maximum Pressure	Case Size	Increment Divisions
2434A-2*	LP-Gas Only	Steel	35" w.c. and 20 oz. (Dual)	2½"	1" w.c. and 1 oz.
2434-2**					
3226A-3			30 PSIG	2"	½ PSI
2411		60 PSIG			
5575			100 PSIG		
5547		2 PSI			
5576					2½"
1286		300 PSIG	5 PSI		
1178				500 PSIG	2½"
948		Steel			
612**			Brass		
948B		60 PSIG		5 lb.	
1183			150 PSIG		
A8060	400 PSIG				
A8150					
A8400					

* ¼" Hose Connection

** ⅛" M. NPT Connection



Needle Valves 1224, 1316 and 1318

Application

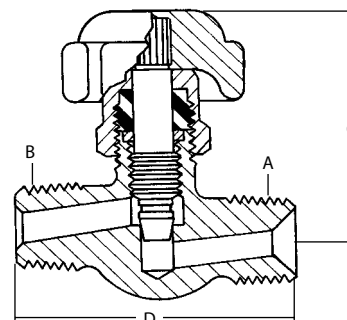
These valves are high quality, "true" throttling valves. Unlike most so-called needle valves, both the body seat and stem are tapered to provide fine, precise control over a wide range of adjustment without stem galling.

The 1224 may be used as a small, inexpensive shut-off valve between a pressure gauge and bulk storage container to allow for convenient gauge replacement.

The 1316 and 1318 provide taper pipe thread by left hand hose connection threads and are useful in a wide range of torch and fuel burner applications where an accurate throttling action is required.



1224



Ordering Information

Part Number	A. Inlet Connection	B. Outlet Connection	C. Height	D. Length
1224WA	1/4" M. NPT	1/4" M. NPT	1 9/16"	1 1/4"
1314WA	9/16" - 18 L.H.	1/8" M. NPT		
1316WA		1/4" M. NPT		

Household Gas Detector/Alarm 100-HGD

Application

The 100-HGD gas fume detection/alarm unit gives advance warning of gas leaks well below the hazard level (1/4th the lowest explosive level). It provides the homeowner more time to take action to protect the family and remedy the problem.

Features

- Available in attractive high impact plastic housing.
- Fume detection systems are reliable and a snap to install.
- Early warning: a high pitched audio alarm and red light visual alarm is activated when propane fumes reach a level of only 1/4 the danger level.
- Built in power filtering system for protection against power fluctuations.
- Every semiconductor sensor unit is properly acclimatized and custom calibrated to the individual circuitry in which it is installed to ensure maximum sensitivity, reliability and accuracy.
- Solid state electronic circuitry.
- Supplied with CSA approved converter for use with standard 110 volt outlets.

Unit Specifications

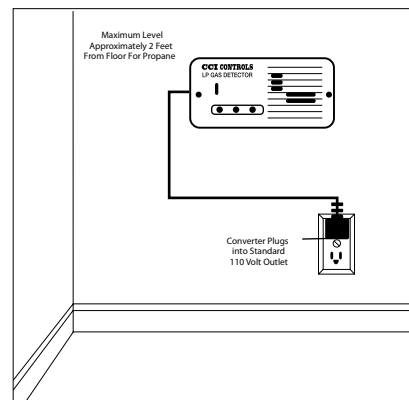
Height 3 3/4"
Width 5 3/4"
Depth 1 3/8"



100-HGD



Typical Installation



Ordering Information

Part Number	Description
100-HGD	Household Propane Gas Alarm

Cross Reference by Part Number

12802	J17	7193D-10	J15
100-HGD	J20	7193K-10B	J16
1178	J19	7193L-10A	J16
1183	J19	7193T-10	J15
1286	J19	7193U-10	J15
1316WA	J20	7194-1	J13
2070CO	J6	7194H-3K	J13
2071-L25.7	J6	7194HD	J13
2071-L39.7	J6	7194M-3K	J13
A2141A10	J7	7194MD	J13
A2141A16	J7	7605A-BT	J12
A2141A6	J7	7605AP-15	J12
A2141A6L	J7	7605AP-16	J12
A2141A8	J7	7605APN-8A	J12
A2141A8L	J7	7605PN-50	J12
2411	J19	7781AFPN-1	J12
2434-2	J19	A7794	J14
2434A-2	J19	A7796	J14
A2805C	J17	7901TB	J13
3165C	J18	A8060	J19
3165CF	J18	A8150	J19
3165CF12.0	J18	A8400	J19
3165S	J18	A9091-18L	J4
3165SF12.0	J18	A9091-18LX	J4
TA3169F12.0	J18	A9091-18N	J4
3195-50	J19	AA9091RM24	J5
3226A-3	J19	9091RM24	J5
5547	J19	AA9092RM36	J5
5575	J19	9092RM36	J5
5576	J19	AA9093RSM48	J5
6010	J11	9093RSM48	J5
AA6010	J11	AA9093TSM48	J5
6016	J10	9093TSM48	J5
AA6016	J10	AA9094RSM60	J5
6016-60D	J12	9094RSM60	J5
6024	J10	AA9094TSM60	J5
AA6024	J10	9094TSM60	J5
612	J19	AA9095RSM72	J5
7177	J13	9095RSM72	J5
7188	J13	AA9095TSM72	J5
7188-21	J13	9095TSM72	J5
7188HS	J13	948	J19
7188MS	J13	948B	J19
7193-4	J13	TSS3169	J18
7193D-10	J13		

J

