A3217A Series
3" Internal Valves
Installation and Operation Manual

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

This valve must remain in the closed position except during product transfer. A line break downstream of the pump may fail to actuate the excess flow valve as the pump may limit flow. If a break occurs in the system, or the excess flow closes, immediately shut down the system.

Inspection and maintenance on a periodic basis is essential. Installation, disassembly, repair and maintenance must be performed only by qualified personnel.

Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

Thermal links or thermal fuses must not be painted or have any type of ornamental finish applied. Doing so could prevent the thermal device from activation when exposed to a temperature of 250°F.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

Foreword

The A3217A Series 3" Flanged Internal Valves are designed primarily for use with propane, butane and anhydrous ammonia. The valve can be used on bobtail delivery trucks, transports and stationary storage tanks with flanged pumps or piping. It may be operated manually, by cable or with air. Special feature design allows switching between left and right hand with minimal effort.

How The Valve Works - See Figure 1

View “A” shows the valve held closed without leakage by tank pressure and the valve’s closing spring. Actuation of the operating handle alone does not open the valve, it only allows pressure to equalize between the inlet and outlet of the valve by rapid bleeding of the product downstream. This equalized pressure then allows the valve to open via the internal spring.

The valve opens by moving the handle to mid-point, see view “B”. This position allows the actuator to put the equalizing portion of the valve stem in the pilot opening, allowing more product to bleed downstream than if the handle was fully open.

In a few seconds, the tank and downstream pressure will be nearly equal. The excess flow spring will push the main poppet to the open position, see view “C”, the handle should then be moved to the fully opened position.

If at first, the handle is quickly moved to the fully opened position, the pilot valve allows a small amount of bleed downstream, but much less than during rapid bleed ,view “B”. This results in a longer pressure equalizing time before the main valve can open.

NOTE: The main poppet will not open until outlet pressure approximates tank pressure!

Once the main poppet is open, flow greater than the excess flow rating, or a sufficient surge in flow, forces the main poppet closed against the excess flow spring, as seen in view “D”. The pilot valve in this position is open and allows a small amount of bleed downstream, but much less than during rapid bleed ,view “B”.

When the operating handle is moved to the closed position, the valve closes and a leak-tight seal is re-established as seen in view “A”.

REGO 10 YEAR WARRANTY

Valve Installation

A 3" 300 lb. ANSI RF flange with a modified bore of 4-5/8" diameter and a 5-3/4" RF must be installed in the tank. New studs and nuts are also recommended. Be sure flange is clean, smooth and free of imperfections before valve installation. Coat the full length of the studs with an anti-seize compound to prevent rusting and provide for easy removal of the valve for maintenance.

Place gasket with larger interior diameter on top flange of valve body to seal against tank opening.

NOTE: The screen should be removed if the valve is to be used for both filling and withdrawal service or for filling alone.

Support and position valve under flange opening of tank in its installation position. Be sure that:

a) the handle is in a fully operable, convenient position and free of all obstacles, and that

b) the handle is oriented in the proper direction to accommodate controls.

Carefully insert valve into flange opening and onto the studs. Tighten two opposite nuts and bring valve flush to flange with gasket in place in groove – see Figure 2. In sequence, start six remaining nuts and tighten all nuts securely, side-to-side and alternately.

Once all eight nuts are hand tight, torque to 150 ft-lbs side to side and alternately. Then torque to 200-220 ft-lbs side to side and alternately.

Place gasket with smaller interior diameter on bottom of lower flange before connecting pump or mating flange.

Once all eight nuts are hand tight, torque to 150 ft-lbs side to side and alternately. Then torque to 200-220 ft-lbs side to side and alternately.

A hydrostatic relief valve need not be installed between the A3217A Internal Valve and next adjacent Shut-Off Valve as excessive line pressure is automatically relieved by the internal valve into the tank.

After valve, pump and system piping are fully installed, run a thorough leak test using a high quality leak detection solution. Unit must be leak-free before being placed in service. In addition, the system must be tested for excess flow valve operation.

WARNING: This test must be performed in a safe location, as testing with flammable gas is extremely hazardous. Only authorized trained personnel should perform this test.

NOTE: To provide excess flow protection, the flow rating of the pump, piping, valves, fittings and hose on the inlet and outlet sides of the valve must be greater than the flow rating of the valve. Keep piping from the valve outlet to the pump full-size and as short as possible with a minimum number of bends. Any restrictions that reduce the flow to less than the excess flow valve rating will result in the excess flow valve not operating when required.

Valve Change Over - See Figure 3

The A3217A Series 3" Flanged Internal Valve is designed in such a manner to allow the change over of the valve from a right handed version to a left handed or from a left handed version to a right handed version depending on the application. To change the valve over;

1. Remove the two hex head screws on the top of the valve.
2. Remove the strainer top and strainer.
3. Remove the set screw from the top end of the valve.
4. Rotate the valve handle in direction that acts to open the valve.
5. Continue the handle rotation past the full open position until the linkage flips. Once the linkage flips, the valve will act to close itself.
6. Remove the roll pin from the handle.
7. Rotate the handle to the desired closed valve position (approx 90°).
8. Replace the roll pin.

The valve should now function mirrored to its original orientation.

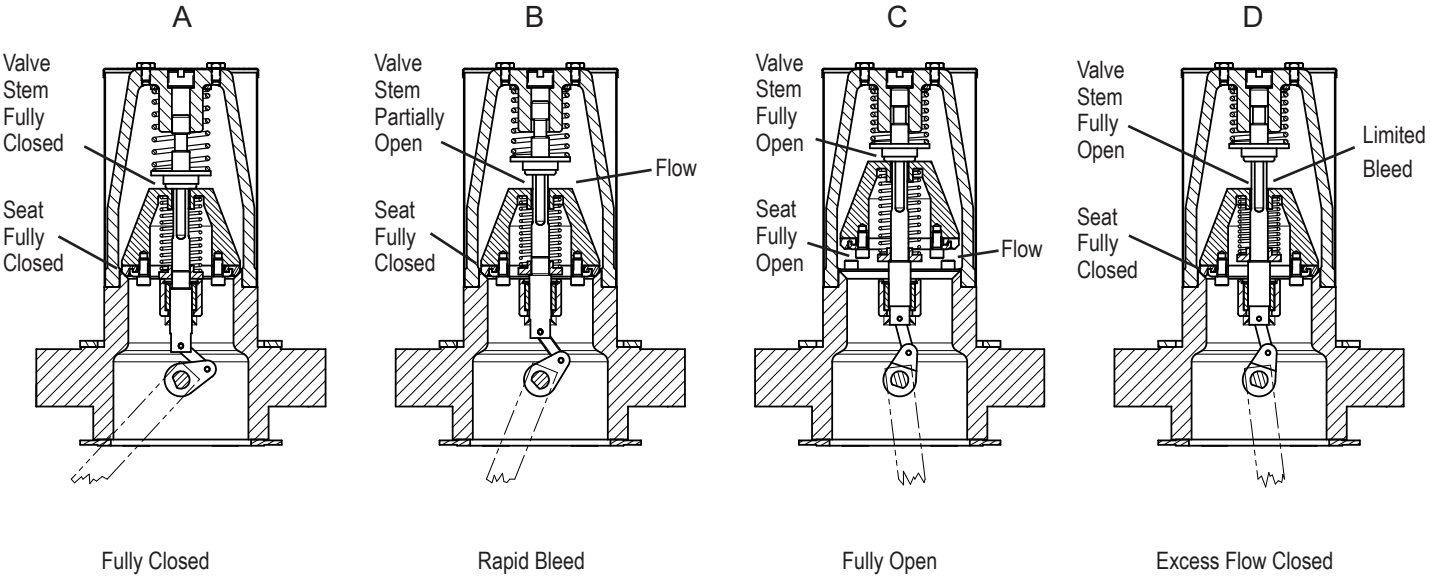
Cable Control System

The cable control system employed must meet the requirements and be in accordance with the provisions of NFPA #58, DOT, ANSI, and all applicable federal, state, provincial and local codes.

Valve Operation and Precautions

1. Valve must be opened before starting pump, and before opening valve on pump outlet.
2. Leave pumping system “wet” to avoid drying of seals and to reduce time involved in opening valve. Drain piping only when required by codes or safe operating practices.
3. When piping is dry or at a lower pressure than the tank, open valve half-way for a few seconds to allow line pressure to equalize before fully opening the valve handle. The main poppet may not open immediately if the handle is placed in the open

Figure 1 — Valve Operation



position too quickly.

4. Flow surges may close the built-in excess flow valve and should be avoided. If the valve slams shut, immediately stop the pump, close the nearest downstream valve, and move handle to mid-point position to equalize pressure until valve reopens with a click, then restart pump and open downstream valve slowly.
5. Always keep valve closed except during product transfer.
6. Avoid partially opening valves during pumping. The resulting restriction may prevent excess flow valve from closing when required.
7. All personnel must be aware of remote closure locations and their operation in case of an emergency.
8. Never, under any circumstances, permanently wire open the operating handle of the internal valve.

Troubleshooting

1. **Internal Valve Will Not Open**

   Causes may be excess leakage downstream as pressure cannot equalize, pump engaged too quickly, excessive wear of valve, or ice freezing on poppet.

   When there is excessive volume downstream, a greater amount of time is required to equalize tank and downstream pressure.

   To determine if the pilot seat is opening, install a pressure gauge downstream of the valve outlet, open any hand valves between valve and pressure gauge; then open valve. Pilot seat is not opening if pressure does not build up to tank pressure. Perform this test with pump off. A broken internal part may cause pilot seat not to open.

2. **Premature Valve Closure**

   First, check to see that operating lever is properly connected and fully opens valve. Premature closure may also be a result of engaging pump too quickly, sudden line surges, an under-rated excess flow spring or an obstructed inlet port.

3. **Internal Valve Will Not Close**

   Usually a result of faulty or sticking actuator. Check actuator to see that it works freely by disconnecting it from valve handle and cycling it several times, before disassembling valve. Also, operate valve handle manually. If it sticks in the open position, replace the packing and bushings. This should free the operating mechanism providing the valve has no internal damage.

4. **Low Flow Capacity**

   Downstream piping may be too small and/or long, screen or strainer may be plugged, possible restriction downstream, or a bypass valve stuck in the open position are causes of low flow. Also, the bypass valve may be set too low and is prematurely opening. See Technical Guide 102 for troubleshooting procedures.

Maintenance

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

1. Check to see that the operating handle moves freely and smoothly. Check shaft-bonnet nut for leakage with high quality leak detection solution. Leakage requires replacement of the bonnet packing. A sticking handle may indicate trapped foreign material or mechanism wear. Replacement of shaft seals, shaft bushings and/or stem bushings may be necessary.
2. Check both seat discs for tight closure. Close valve and exhaust downstream pressure. Be sure piping is warmed to an ambient temperature. Close the first downstream valve and observe for pressure build-up between the two closed valves with a pressure gauge. If leakage occurs, replace both seat discs.
3. Inspect, clean and oil all operating controls. Check controls to see that they open fully, but do not over-travel the valve operating handle and lever. See that they work freely to close the valve. Worn parts should be replaced.
4. Remove valve if the tank is to be steam cleaned. Heat may damage the valve seals.
5. Valve is not designed for water service. After tank is hydrostatically tested, immediately remove all water and allow tank to thoroughly dry out before installing valve.

Figure 2 — Valve Installation

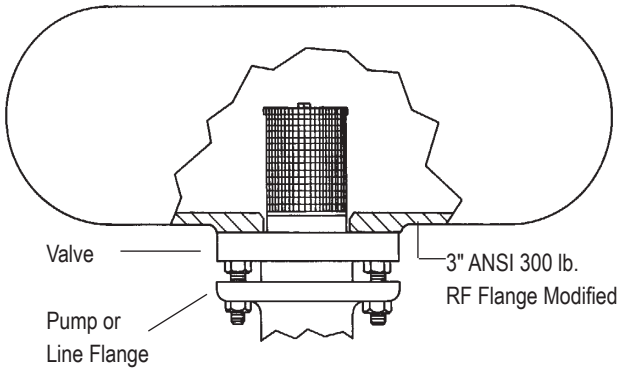
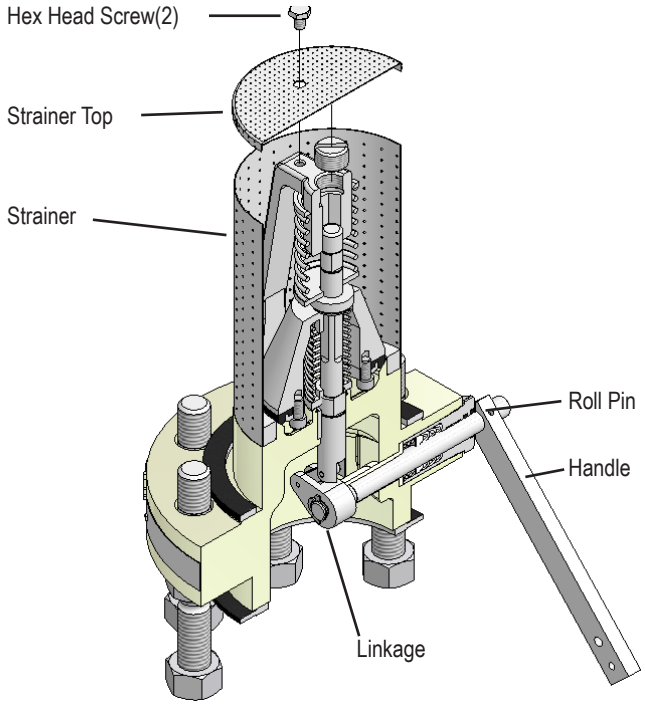
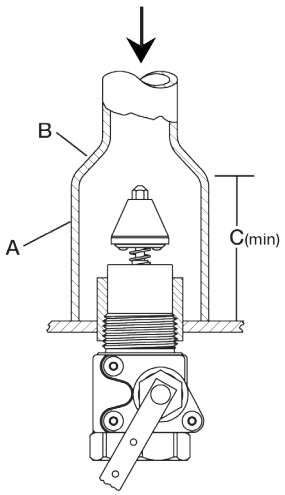


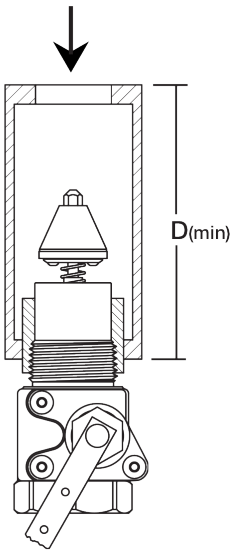
Figure 3 — Valve Change Over

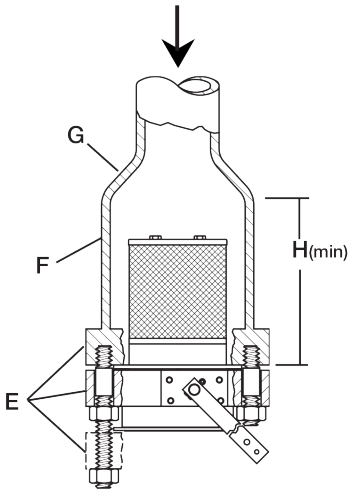


PipeLine Application for Internal Valves



Standpipes			
	A Pipe Size	B Reducer	C Length (min)
A3209 Series (1 1/4" MNPT)	2"	2" x 1 1/4"	8"
A3212 Series (2" MNPT)	3"	3" x 2"	12"
A3213 Series (3" MNPT)	5"	5" x 3"	14"
A3217 Series (3" Flange)	6"	6" x 3"	14"
A3219 Series (4" Flange)	8"	8" x 4"	14"





In-Line Piping Connections		
Screwed Internal Valve	D (min)	Pipe (min)
A3209 Series (1 1/4" MNPT)	8"	2" Sched. 80
A3212 Series (2" MNPT)	12"	3" Sched. 80
A3213 Series (3" MNPT)	14"	5" Sched. 80

In-Line Piping Connections			
E 300 lbs ANSI RF Flange	F Pipe Size	G Reducer	H Length (min)
A3217 Series (3")	6"	6" x 3"	14"
A3219 Series (4")	8"	8" x 4"	14"

NOTICE

LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO® parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

LIMITED 10 YEAR WARRANTY

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

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

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

LIMITATION OF LIABILITY

RegO® 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 causes be based on theories of contract, negligence, strict liability, tort or otherwise.

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

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

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

WARNING

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

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

NOTICE TO USERS OF PRODUCTS

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

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

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Elon, N.C. 27244 U.S.A. Phone +1 (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com