

ECII/Rego Products

Operating Instructions for A3217DF, A3217F, 3217F

Flange Mounted Internal Valves for Liquid or Vapor Service

Suitable for use on LP-Gas and Anhydrous Ammonia

Maximum Allowable Pressure 25 bar

WARNING: Installation, usage and maintenance of this product must be in compliance with all Engineered Controls International Inc. instructions as well as requirements and provisions National 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 actual end user of the valve.

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.

Installation:

1. A 3" 300 lb. ANSI RF flange with a modified bore of 4 5/8" diameter and 5 3/4" RF must be installed in the tank. New studs and nuts are also recommended.

2. Be sure flange is clean, smooth and free of imperfections before valve installation.

3. Coat full length of studs with anti-seize compound to prevent rusting and provide for easy removal of the valve for maintenance.

4. 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.

5. Support and position valve under flange opening of tank in its installation position.

6. 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.

7. 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.

8. In sequence, start six remaining nuts and tighten all nuts securely, side-to-side and alternately.

9. Place gasket with smaller Interior Diameter on bottom of lower flange before connecting pump or mating flange.

Note: A hydrostatic relief valve need not be installed between the A3217F and next adjacent shut-off valve as excessive line pressure is automatically relieved by the internal valve into the tank.

10. 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.

11. In additions the valve should be tested for excess flow valve

operation by simulating a leak downstream at the furthest point being protected.

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.

Cable Control System

The cable control system employed must meet the requirements and be in accordance with the provisions of applicable National, and Local codes.

Operation:

The A3217F 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.

How the Valve Works

Refer to the drawings in Figure 1.

1. View "A" shows the valve held closed without leakage by tank pressure and the valve's closing spring.

2. 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.

3. 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",

4. The handle should then be moved to the fully opened position.

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

5. 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 product to bleed downstream, but much less than during rapid bleed .view "B".

6. 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".

Valve Operation

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 position too quickly.

4. Flow surges may close the built-in excess flow valve and should be avoided. If the valve slams shut, immediately stop the pump, close the nearest downstream valve, and move handle to midpoint position to equalize pressure until valve reopens with a click, then restart the pump and slowly open downstream 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 of poppet.

When there is excessive volume downstream, a greater amount of time is required to equalize tank and downstream pressure. To determine if the pilot seat is opening, install a pressure gauge downstream of 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.

Maintenance and Inspection:

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.
6. Always keep valve closed except during product transfer.

Hazards:

- Avoid partially opening valves during pumping. The resulting restriction may prevent excess flow valve from closing when required.
- All personnel must be aware of remote closure locations and their operation in case of an emergency.
- Never, under any circumstances, permanently wire open the operating handle of the internal valve.
- Never uncouple the valve connections until all pressure is bled from the lines.

Figure 1 — Valve Operation

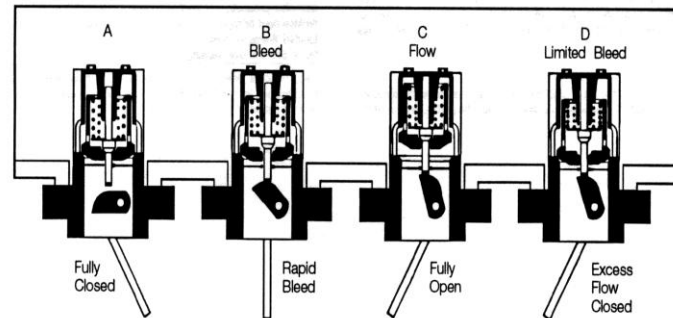
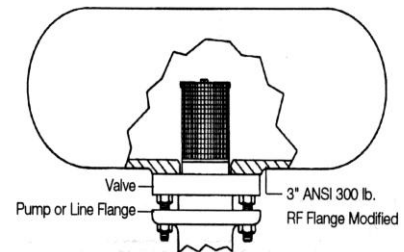


Figure 2 — Valve Installation



General Warning:

All ECU products are mechanical devices that will eventually become inoperative due to wear contaminants, corrosion, and aging components. Periodic inspection and maintenance are essential. The safe useful life of this product can vary greatly depending on the environment it is exposed to, and the inspection/maintenance program that is used. For more information refer to RegO Products L-500 catalog or www.regoproducts.com.

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