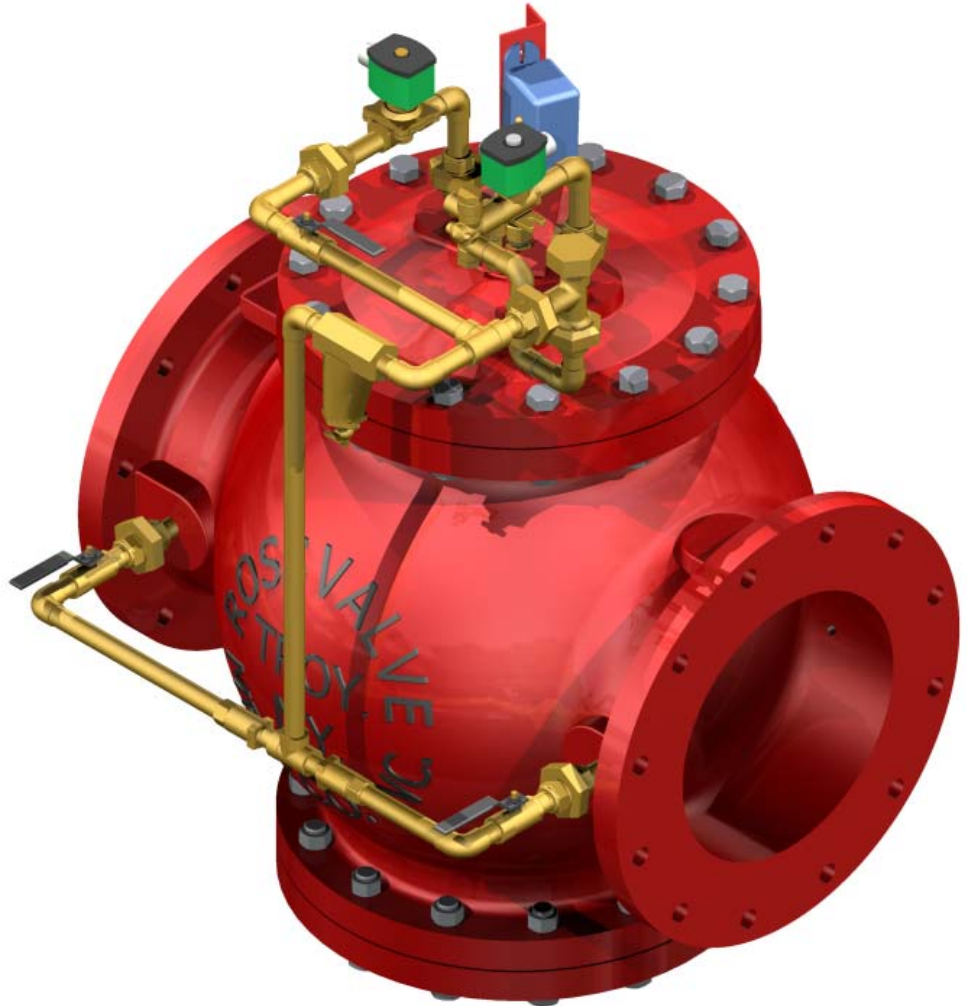


OPERATIONAL MANUAL

ROSS

1879 VALVE

OPERATIONAL MANUAL



Buy American



All Ross Valves are
100% ARRA Compliant

www.rossvalve.com

ROSS TECHNOLOGY PARK
79 102ND STREET
TROY NY 12180

TEL 516.274.0961
FAX 516.274.0210

INSTALLATION / START-UP (ROSS PISTON VALVE – GLOBE OR ANGLE STYLE)

Shipment:

Prior to shipment, each valve is thoroughly tested and pre-adjusted at the factory to the expected field conditions. Any visible damage to the crate or packaging should be immediately brought to the attention of the shipping company and documented with photographs.

Depending upon the valve size, external controls may be attached or in a separate box. The inlet of the main valve is identified with a metal tag. When controls are shipped separately, connections are tagged.

Storage:

If it is necessary to store the valve before installation, it should be protected from the elements. Inside storage is recommended. If this is not possible, the valve should be protected from dirt, heat, freezing, and direct sunlight.

Installation:

1. Carefully remove all shipping materials and check the valve for any other foreign objects.
2. If possible, flush the line before inserting the valve.
3. The valve is tagged with a model and serial number. It is recommended that the serial number be noted in your records as this will be requested by the factory when any technical support or parts replacement is required. **Valve serial number: L_____.**
4. Place the valve in line with the flange marked "INLET" facing the high pressure or supply line.
CAUTION: Do not obstruct the vent hole in the center of the bottom cap (#16 for Globe Body valves) or in the differential cylinder bracket (#27 for Angle Body valves). Allow enough clearance above the valve for removal of the stem assembly.
5. If external piping and controls are not attached to the valve when shipped, connect couplings identified with tags that are numbered. The arrow on the pilot valve body points in the direction of flow through the pilot valve. Flow is always away from the top cap of the main valve. The indicator rod (#20) shows the position of the main stem.
6. Attach gauge cocks to the back side of the valve.
7. Complete any necessary wiring on solenoid valves (if applicable).

Start-Up:

1. Close the isolation valves (#18) in the control piping.
2. Open the main line gate valve (if installed) on the discharge/downstream side of the valve.
3. *Slowly* open the main line gate valve (if installed) on the inlet/upstream side of the valve.
4. Open the isolation valves (#18) in the control piping.
5. Loosening the union of the control piping on the top cap side of the speed control valve will help bleed air and give a positive indication when the operating chamber is full. It may be necessary to apply pressure to the valve indicator rod (if provided) with a wrench handle or block of wood until the valve operating chamber is pressurized.
6. No lubrication or adjustment to the valve is required or recommended. The valve has been thoroughly tested at the factory and set to the expected field conditions.

PUMP CONTROL VALVE

Purpose: Control surges caused by pump starting/ stopping **Model Number: 42WRS**

Sizes: 2" - 48"

Type: Nonthrottling system

Primarily Controlled By: Electricity

Located: In line

Purpose: To control surges caused by pump starting and stopping

Inlet Pressure: Maximum: 300 psi

Inlet Pressure: Minimum: 5 psi

Construction: Cast iron (semi-steel) body with bronze trim
Body: 2" - 36" - Cast iron (semi-steel) with bronze trim
40" - 48" - Ductile iron, with bronze/ stainless steel trim

Control Devices:

Strainer: Model 5F-2

Valves:

Needle: (Closing Control)

Needle: (Opening Control)

Pilot: Solenoid: 3 Way

Other System Components:

Limit Switch: Wired to normally closed contact

Options

1. Angle body design (90 degree)
2. Cast steel or ductile iron body and stainless steel trim
3. Two 2-Way solenoids - To hold the piston in an intermediate position
4. Teflon coated cylinders

Customized Features

Any one or a selection of the features can be added to the basic pump control valve.

Code

MC2001P - Pump Control Panel:
Computer Based- 2nd Generation

CP - Pump Control Panel: Mechanical Relay

PR - Pressure Reducing Valve

BP - Back Pressure Sustaining Valve

CI - Check Feature (Internal)

SO - Solenoid Pilot Valve:

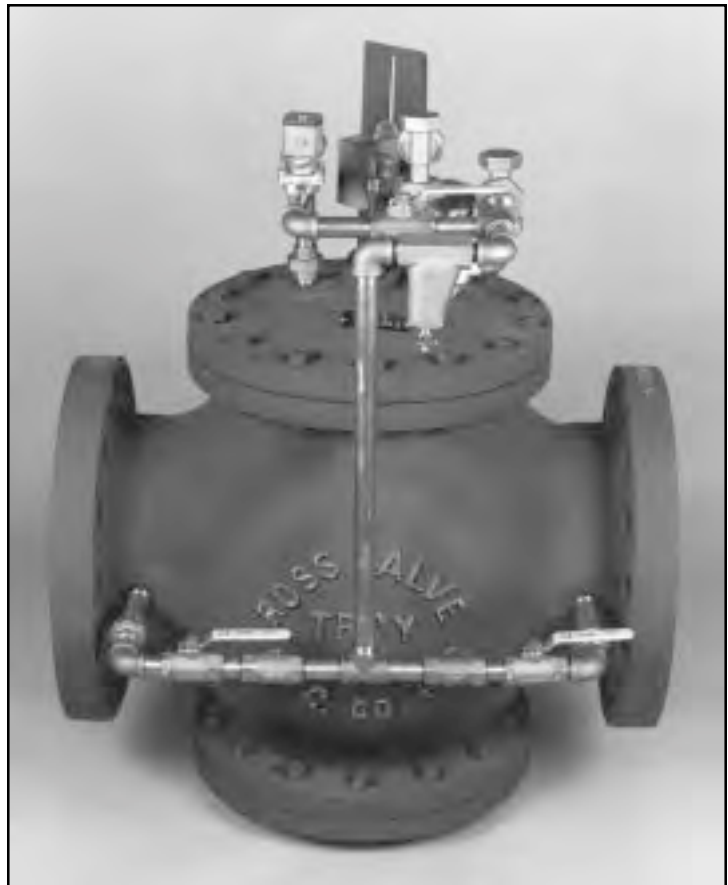
2 Way Emergency Close

ES - Higher Efficiency Strainer

TD - Time Delay Relay

PS - Pressure Switch

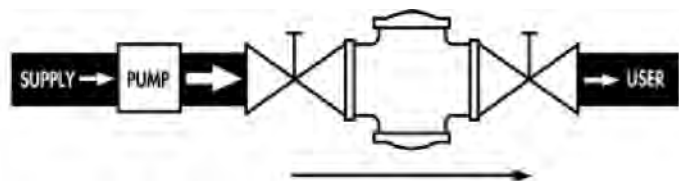
Factory: Telephone (518) 274-0961; Fax (518) 274-0210



Ross engineers customize the basic **42WRS** to accommodate individual needs.

Basic Applications

1. Minimize pump starting and stopping surges.
2. Prevent reverse flow when the controls are de-energized.



If: Pump pressure is less than system pressure or the pump is not running

Ross Main Valve will: Remain closed.

When: Pump starts

Ross Main Valve will: Open slowly after the pump start up to minimize possible surges.

When: Pump stops

Ross Main Valve will: Already be 95% closed to minimize possible surges.

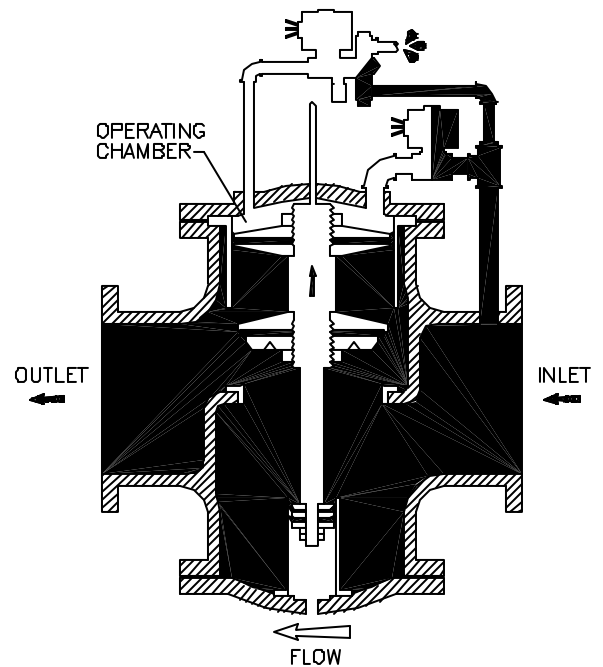
GENERAL OPERATION OF A ROSS VALVE (Model 42WR-S)

All Ross Valves operate with the same basic hydraulic principles and are composed of two essential parts: the main valve (through which the main flow of water passes), and a control device (which is piped externally on the main valve).

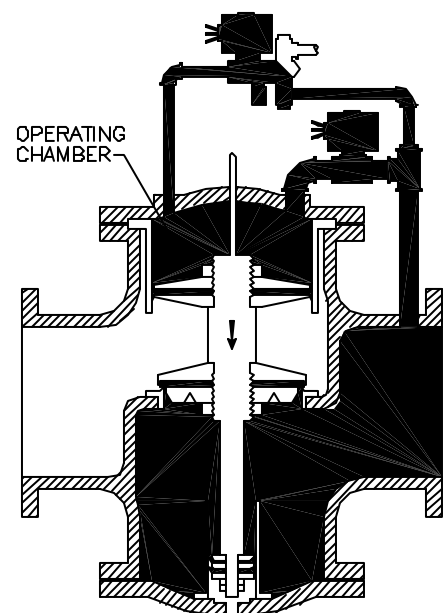
The control device is varied to suit the specific type of operation desired. In this case, it includes a 3-way and a 2-way (optional) electrically-actuated, non-throttling solenoid valve. Its basic function is to control the pressure in the "operating chamber" (the area above the large piston in the main valve).

The main valve, no matter what its function, is of the same fundamental design. A stem, which carries a seat disc between a large and a small piston, is free to move along the axis of the cylinders. This movement corresponds to the opening and closing of the valve, as follows:

Opening - Typically, when the pump is started the solenoid valves in the control circuit are energized. This arranges the solenoid porting in such a way that the operating chamber is emptied. Line pressure, acting on the exposed areas of the stem, produces a net upward hydraulic force which lifts the stem assembly (including the seat disc), and allows water to flow unrestricted through the valve.



Closing - When the porting through the solenoid pilot valves is electrically changed, the inlet pressure forces the operating chamber to fill with water. As the pressure in the operating chamber builds up, the stem assembly is forced to move down into its seat, preventing flow through the valve. (Note: When supplied, the 2-way solenoid is used for "Emergency Close" situations. In the event of a power failure, the 2-way solenoid will open to fill the operating chamber quickly, regardless of what the smaller, 3-way solenoid is doing.)



These are the basic principles used in all of our valves.

OPER44EC

PUMP CONTROL VALVE

Operation

Model Number: 42WRS

Control Unit

A carefully balanced system of controls along an external piping circuit monitors flow in and out of the operating chamber and, consequently, the piston open/closed position relative to the pump stopping/starting. It includes:

- a. External Piping with several basic segments which run from the:
 1. Inlet side of the main valve to a pipe leading into the operating chamber.
 2. Outlet side of the main valve to a pipe leading out of the operating chamber.
 3. Inlet/outlet external pipes into the operating chamber.
- b. Normal Solenoid pilot valve
Three openings and two ports control pressure in the operating chamber
 - 1 Opening - to the operating chamber.
 - 1 Opening - to the line (controlled by 1 port).
 - 1 Opening - to waste (controlled by 1 port).
- c. Emergency Close-Solenoid pilot valve - (Customized feature used on most installations.)
Two openings and one port control flow from the operating chamber.
- d. Needle Valves - Two valves control maximum flow:
 - 1 Needle - Into the operating chamber.
 - 1 Needle - Out of the operating chamber.
- e. Limit Switch - Switches on and off by movement of a valve indicator.

Operation

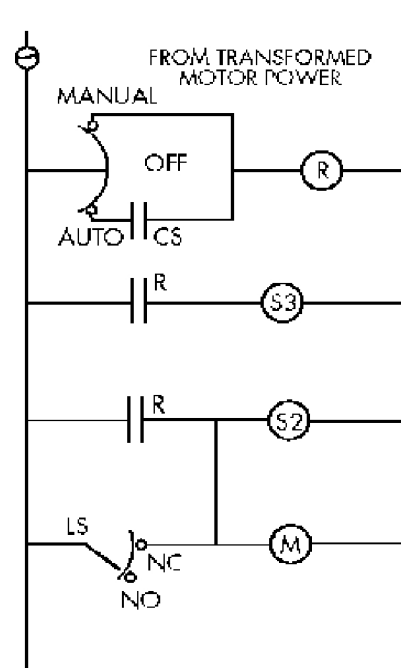
By slowly going full open after the pump starts and 95% closed before the pump stops, the valve effectively provides the system with a smooth stopping and starting flow.

- A. In order to open the main line valve, the
 1. Control switch contacts close together, energizing the relay coil R.
 2. Two R contacts close together energizing the:
 - a. Normal solenoid coil S_3 .
 - b. Emergency (backup) solenoid coil S_2 .
 - c. Pump motor starter coil M.
 3. Pump starts.
 4. When the pump develops enough line pressure, the valve slowly opens.
 5. As the valve opens, limit switch LS closes and parallels the R contact to be in series with the:
 - a. Emergency solenoid pilot S_2 .
 - b. Pump motor starter M.
- B. In order to close the main line valve, the
 1. Control switch contacts open, de-energizing the relay coil R.
 2. Two R contacts open and de-energize only the normal solenoid coil S_3 .

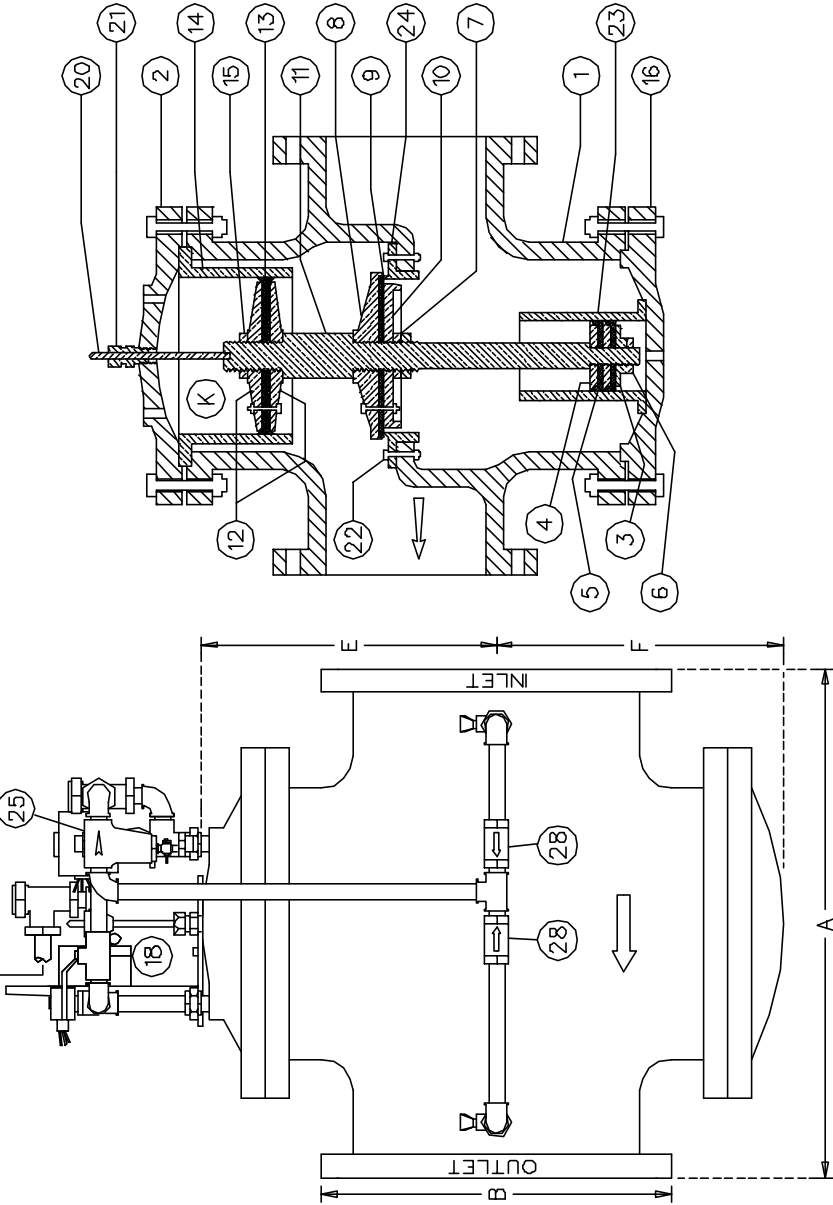
3. Main line valve begins to close.
4. Limit switch, whose contacts are still closed, continues to energize the:
 - a. Emergency solenoid coil S_2 .
 - b. Pump motor starter coil M.
5. Pump continues running.
6. Main line valve reaches 95% closed causing the limit switch contacts to open and de-energizing the:
 - a. Emergency solenoid coil S_2 .
 - b. Pump motor starter M.
7. Pump stops.

THIS EXAMPLE IS VERY BASIC. Refinements such as stepped voltage starting, thermal and reverse phase motor protection, interlock to prevent accidental start from limit switch, etc., are desirable. ROSS ENGINEERS ARE AVAILABLE to make suggestions.

Simple example incorporating second 2 Way Solenoid (customized) feature.



- CS = Control Switch
M = Motor Starter Relay
R = Double Pole Normally Open Relay
LS = Limit Switch (Shown in Valve Closed Position)
 S_3 = Normal Solenoid Coil
 S_2 = Emergency (backup) Solenoid Coil



| VALVE SIZE (IN) | ANSI B.16 CLASS | SHIPPING WEIGHT (LBS) | DIMENSIONS (INCHES) | | | E&F |
|-----------------|-----------------|-----------------------|---------------------|------------------|----------------|------------------|
| | | | A | B | C&D | |
| 4 | 125 250 | 235 275 | 14 14-5/8 | 9 10 | 4-3/4 4-3/4 | 7 7 |
| 6 | 125 250 | 375 430 | 17-3/4 17-3/4 | 11 12-1/2 | 6-5/8 6-5/8 | 9 9 |
| 8 | 125 250 | 690 750 | 24 24-13/16 | 13-1/2 15 | 8-3/4 8-3/4 | 12-1/2 12-1/2 |
| 10 | 125 250 | 920 1000 | 24-7/8 26-1/4 | 16 17-1/2 | 10 10 | 14-1/4 14-1/4 |
| 12 | 125 250 | 1375 1475 | 30 31-1/2 | 19 20-1/2 | 12 12 | 15-1/2 15-1/2 |
| 14 | 125 250 | 1770 1850 | 34-1/4 35-5/4 | 21 23 | 14 14 | 18 18 |
| 16 | 125 250 | 2400 2600 | 37-7/8 39-1/4 | 23-1/2 25-1/2 | 15 15 | 21-1/2 21-1/2 |

| PART | DESCRIPTION | QTY. | MATERIAL |
|------|---------------------------------|------|------------------|
| 1 | VALVE SHELL | 1 | CAST IRON |
| 2 | TOP CAP | 1 | CAST IRON |
| 3 | BOTTOM STEM GUIDE NUT | 1 | BRONZE |
| 4 | BOTTOM CUP FOLLOWERS (SET OF 2) | 1 | BRONZE |
| 5 | PISTON CUP PACKING | 2 | LEATHER |
| 6 | BOTTOM STEM LOCK NUT | 1 | BRONZE |
| 7 | STEM NUT | 1 | BRONZE |
| 8 | SEAT DISC | 1 | BRONZE |
| 9 | SEAT PACKING | 1 | POLYURETHANE |
| 10 | SEAT PACKING SUPPORT | 1 | BRONZE |
| 11 | STEM | 1 | BRONZE |
| 12 | MAIN CUP PLATES (SET OF 2) | 1 | BRONZE |
| 13 | MAIN CUP PACKING | 2 | LEATHER |
| 14 | MAIN BUSHING | 1 | BRONZE |
| 15 | TOP STEM NUT | 1 | BRONZE |
| 16 | BOTTOM CAP | 1 | CAST IRON |
| 18 | ISOLATION VALVE | 2 | BRONZE |
| 20 | INDICATOR ROD | 1 | BRONZE |
| 21 | INDICATOR STUFFING BOX | 1 | BRONZE |
| 22 | BOLTS & NUTS (SEAT RING) | VARY | BRONZE |
| 23 | BOTTOM CAP CYLINDER | 1 | BRONZE |
| 24 | SEAT RING | 1 | BRONZE |
| 25 | STRAINER | 1 | BRONZE/STAINLESS |
| 26 | SOLENOID 2-WAY - EMERGENCY | 1 | BRONZE/STAINLESS |
| 27 | SOLENOID 3-WAY - NORMAL | 1 | BRONZE/STAINLESS |
| 28 | CHECK VALVE | 2 | BRONZE |
| 29 | LIMIT SWITCH ASSEMBLY | 1 | MISC |
| 32 | NEEDLE VALVE - OPENING CONTROL | 1 | BRONZE |
| 33 | NEEDLE VALVE - CLOSING CONTROL | 1 | BRONZE |
| | BOLTS & NUTS (TOP & BOTTOM CAP) | VARY | STEEL |
| | BOLTS & NUTS (CUP PLATES) | VARY | BRONZE |
| | BOLTS & NUTS (SEAT DISC) | VARY | BRONZE |
| | BOLTS (BOTTOM CAP CYLINDER) | VARY | BRONZE |
| | INDICATOR ROD PACKING (SET) | 1 | TEFLON |
| | COVER & MAIN BUSHING GASKETS | 3 | COMPOSITION |
| | STEM GASKETS | 3 | COMPOSITION |

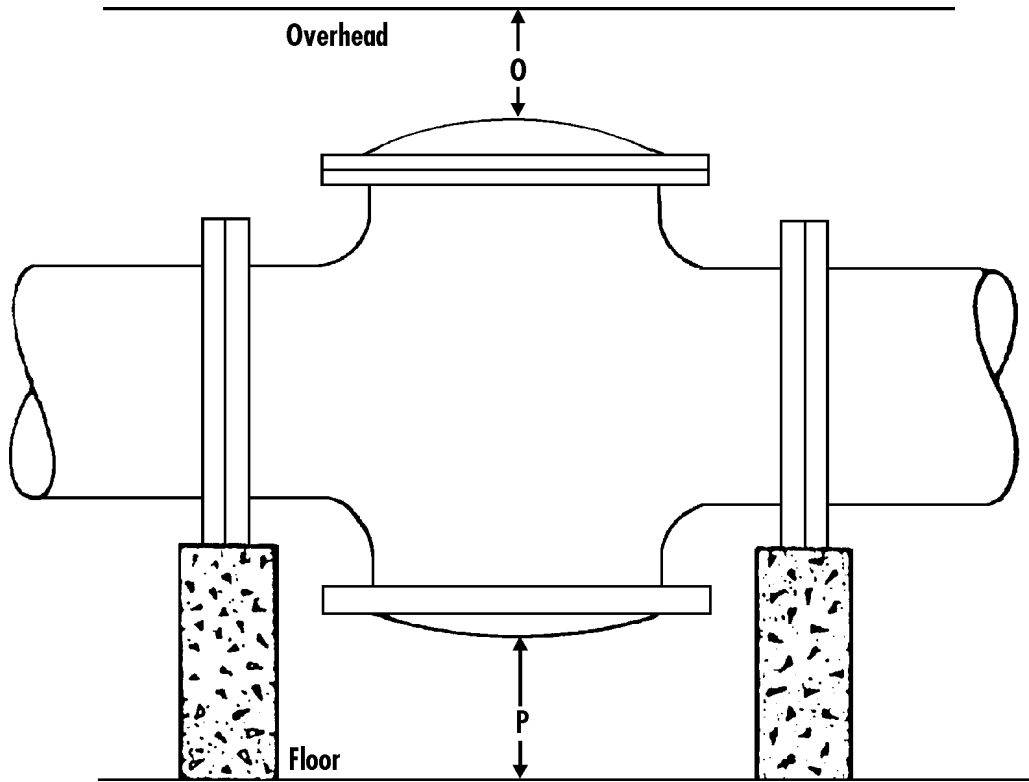
ROSS VALVE Mfg. Co., Inc.
 6 OAKWOOD AVENUE - TROY, NEW YORK, 12180 - TEL. (518) 274-0961
 POST OFFICE BOX 595 - TROY, NEW YORK, 12181 - FAX (518) 274-0210
 WEBSITE: www.rossvalve.com - E-MAIL: sales@rossvalve.com

DRAWING 42WR-S DATE 12-22-00 RJC
 GLOBE BODY 4" - 16" NO SCALE FIGURE 44EC
 Model 42WR-S
 PUMP CONTROL VALVE (ELECTRIC CHECK)
 WITH EMERGENCY CLOSE FEATURE

DIMENSIONS

Globe Body Minimum Clearances

Piston Valve Sizes: 4" - 36"



| Size (Inches) | 4" | 6" | 8" | 10" | 12" | 14" | 16" | 18" | 20" | 24" | 30" | 36" |
|---------------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| O | 14 | 16 | 18 | 21 | 23 | 28 | 28 | 33 | 33 | 36 | 43 | 46 |
| P | 4 1/2 | 5 1/2 | 6 1/2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Note

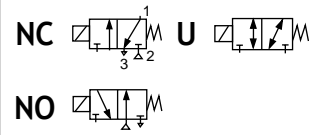
1. Dimension "O" is clearance for removal of the top cap and piston for repacking the main valve. Additional working space for the convenience of the service man should be considered above as well as around the valve.
2. Dimension "P" as listed is the desirable clearance under the valve for removal of the STANDARD bottom cap. This dimension may be reduced to 1 inch for all valves on special applications.

Note

- A. **Do not obstruct vent hole located at the center of the bottom cap.**
- B. Consideration should be given for installation of valves 14" or larger under manhole in the roof of the valve vault or for additional clearance above the valve since a mechanical hoist will probably be required for removal of the piston. An eye bolt or hook cast in the cover slab over the center of the valve is useful.
- C. If clearance under the valve is limited, dimensions "O" and "P" can be modified. Consult the factory concerning special applications.



Direct Acting
General Service Solenoid Valves
 Brass or Stainless Steel Bodies
 1/8" to 1/2" NPT



3/2
 SERIES
8300
8315

Features

- Designed for high flow and high pressure service.
- Direct acting, requires no minimum operating pressure.
- Choice of metal seating materials to handle aggressive fluids, or resilient seating for airtight shutoff.
- Ideal for power plants and similar applications.

Construction

| Valve Parts in Contact with Fluids | | |
|------------------------------------|---|---------------------|
| Body | Brass | 304 Stainless Steel |
| Disc | 303 Stainless Steel (Metal), PA or Brass (Resilient) | |
| Seats | NBR, Phosphor Bronze | 303 Stainless Steel |
| Core Tube | 305 Stainless Steel | |
| Core and Plugnut | 430 F Stainless Steel | |
| Springs | 302 Stainless Steel, 17-7PH or Inconel | |
| Shading Coil | Copper | Silver |
| Gaskets | NBR | PTFE |

Electrical

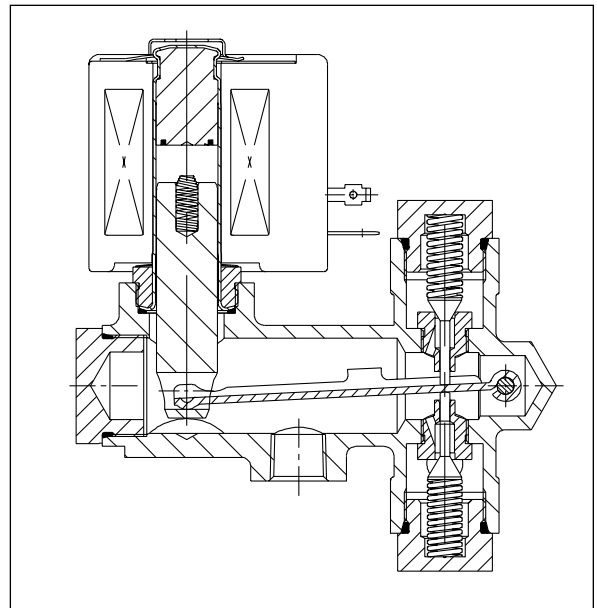
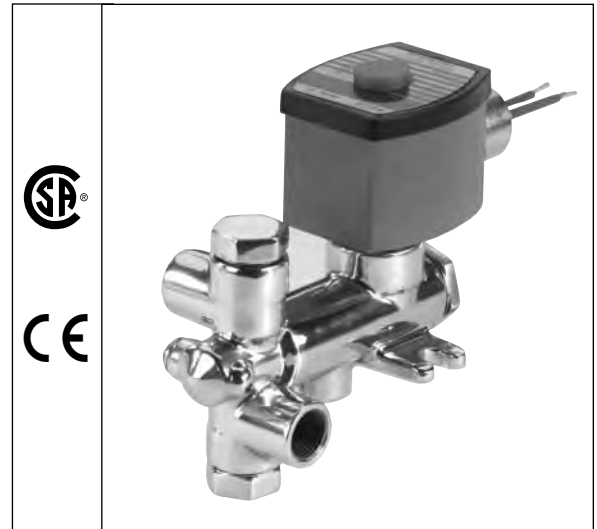
| Standard Coil and Class of Insulation | Watt Rating and Power Consumption | | | | Spare Coil Part Number | | | |
|---------------------------------------|-----------------------------------|-------|------------|-----------|------------------------|--------|----------------|--------|
| | DC Watts | AC | | | General Purpose | | Explosionproof | |
| | | Watts | VA Holding | VA Inrush | AC | DC | AC | DC |
| F | - | 20.1 | 43 | 240 | 272610 | - | 272614 | - |
| H | 36.2 | 28 | 60 | 330 | 222345 | 222184 | 222345 | 222184 |
| H | - | 16.1 | 35 | 180 | 272810 | - | 272814 | - |
| H | - | 28.2 | 50 | 385 | 224195 | - | 224195 | - |

Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.

Note: 125 and 250 volts DC are battery voltages applied in power plants. Special AC and DC constructions are available to pilot power plant control valves. Consult your local ASCO sales office for details.

Solenoid Enclosures

Standard: Red-Hat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; Red-Hat - Type 1.
Optional: Red-Hat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9. See footnote on next page.
 (To order, add prefix "EF" to catalog number.)
 See *Optional Features Section* for other available options.



Nominal Ambient Temperature Ranges:

Class F Coils AC: 32°F to 125°F (0°C to 52°C)

Class H Coils AC: 32°F to 140°F (0°C to 59°C)

Class H Coils DC: 32°F to 77°F (0°C to 25°C)
 (104°F/40°C occasionally)

Refer to *Engineering Section* for details.

Approvals:

CSA certified. Meets applicable CE directives.

Refer to *Engineering Section* for details.

INSTALLATION AND MAINTENANCE INSTRUCTIONS

3-WAY DIRECT ACTING SOLENOID VALVES

NORMALLY CLOSED, NORMALLY OPEN AND UNIVERSAL OPERATION

1/8, 1/4, 3/8 AND 1/2" NPT — METAL TO METAL SEATING

BULLETINS
8300
8302
8315

ASCO

FORM NO. V-5941

DESCRIPTION

Bulletin 8300's are 3-way, direct acting solenoid valves having only four moving parts - a core, a lever and two poppet type valve discs. Valves are supplied with stainless steel seats and discs and valve bodies of brass, steel or stainless steel construction. Standard valves have a General Purpose, NEMA Type 1 Solenoid Enclosure. Bulletin 8315 valves are identical to Bulletin 8300 valves except they are designed for higher temperature service.

Bulletin 8302's are the same as Bulletins 8300 except the solenoids are equipped with an enclosure which is designed to meet NEMA Type 4 Watertight, NEMA Type 7 (C or D) Hazardous Locations - Class I, Groups C or D and NEMA Type 9 (E, F or G) Hazardous Locations - Class II, Groups E, F or G. Installation and Maintenance Instructions for the Explosion-Proof/Watertight Solenoid Enclosure are shown on Form No. V-5381.

OPERATION

Normally Closed (Suffix Letter "F")

Solenoid De-energized: Flow is from Cylinder Connection (1) to Exhaust Connection (3). Pressure Connection (2) is closed.

Solenoid Energized: Flow is from Pressure Connection (2) to Cylinder Connection (1). Exhaust Connection (3) is closed.

Normally Open (Suffix Letter "G")

Solenoid De-energized: Flow is from Pressure Connection (3) to Cylinder Connection (1). Exhaust Connection (2) is closed.

Solenoid Energized: Flow is from Cylinder Connection (1) to Exhaust Connection (2). Pressure Connection (3) is closed.

Universal (Suffix Letter "U")

Solenoid De-energized: Flow is from Connection (3) to Connection (1) or Connection (1) to Connection (3). Connection (2) is closed.

Solenoid Energized: Flow is from Connection (1) to Connection (2) or Connection (2) to Connection (1). Connection (3) is closed.

NOTE: Operation forms are identified by catalog suffix letters as follows:

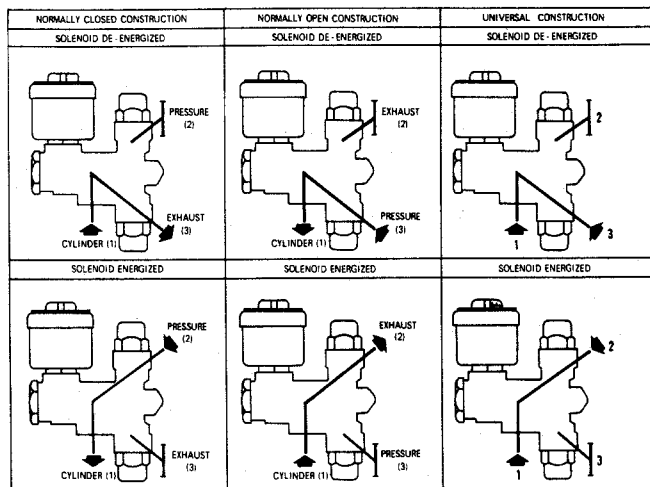
Suffix Letter "F" Normally Closed Operation
Suffix Letter "G" Normally Open Operation
Suffix Letter "U" Universal Operation

CHANGING OPERATION FORMS

Universal valves (U) may be used for any operation form without internal changes. However, normally closed (F) and normally open (G) valves cannot be used for a different operation form unless internal parts (upper and lower springs) are changed. Consult factory for new internal parts and nameplate for proper valve identification. Refer to "NEW SPRING INSTALLATION" Section when changing operation forms.

IMPORTANT: No minimum operating pressure is required.

FLOW DIAGRAMS



NOTE: PORT MARKINGS 1, 2 AND 3 CORRESPOND DIRECTLY TO A, B, AND C.

MANUAL OPERATOR (Optional)

Valves with Suffix "MO" after catalog number are provided with a manual operator which allows operation when desired or during an interruption of electrical power. To actuate valve manually, push knob upward and rotate one half (1/2) turn. Valve will now be in same position as when solenoid is energized. To disengage manual operator, rotate manual operator approximately one half (1/2) turn until guide pin in manual operator stem engages slots in stuffing box bonnet and drops down. CAUTION: For valve to operate electrically, manual operator stem must be fully retracted.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

POSITIONING

Valve must be mounted with the solenoid vertical and upright.

MOUNTING

For mounting bracket mounting dimensions, refer to Figure 3.

PIPING

Connect piping to valve according to markings on valve body. The form of flow is indicated by the Suffix Letters ("F," "G" or "U") following the valve catalog number on nameplate. Refer to flow diagrams provided. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening pipe, do not use valve as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point.

IMPORTANT: For protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on the service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

WIRING

Wiring must comply with Local and National Electrical Codes. Housings for all solenoids are provided with connections or accommodations for 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by removing the retaining cap or clip. CAUTION: When metal retaining clip disengages, it will spring upward. Rotate enclosure to desired position. Replace retaining cap or clip before operating.

NOTE: Alternating Current (A-C) and Direct Current (D-C) solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid base sub-assembly, core/spring sub-assembly or core.

SOLENOID TEMPERATURE

Standard catalog valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched with the hand for only an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

MAINTENANCE

WARNING: Turn off electrical power and depressurize valve before making repairs. It is necessary to remove valve from pipe line for repairs.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate the valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on medium and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic click signifies solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires or splice connections.
2. **Burned-Out Coil:** Check for open-circuited coil. Replace coil if necessary.
3. **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check pressure at the solenoid valve. Pressure to the valve must not exceed that stamped on nameplate.
5. **Incorrect Pressure Connection:** Refer to valve catalog suffix letter on nameplate and flow diagrams.
6. **Excessive Leakage:** Disassemble valve and clean all parts and passageways. Leakage between the seats and discs is usually caused by lodgement of foreign material on the valve seating surfaces. The foreign material, though not present upon examination, may have damaged the seating surfaces enough to cause leakage. Leakage thru the stainless steel (metal to metal) seats can usually be corrected by regrinding and lapping (see section on grinding and lapping). If leakage should still exist, the seating surfaces may be worn more than grinding and/or lapping can correct. In that case, replace both seats and discs. NOTE: New seats and discs must be checked and adjusted for proper stroke where necessary. Refer to paragraphs on "NEW SEAT AND DISC INSTALLATION" under "INSTALLATION OF NEW SPARE PARTS KIT" Section.

COIL REPLACEMENT (Refer to Figure 4)

Turn off electrical power supply and disconnect coil lead wires.

1. Remove retaining cap or clip, nameplate and solenoid cover. CAUTION: When metal retaining clip disengages, it will spring upward.
2. Slip yoke containing coil, sleeves and insulating washers off the solenoid base sub-assembly. For D-C Construction, a fluxplate over the coil replaces the yoke and sleeves. Insulating washers are omitted when a molded coil is used.
3. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.

CAUTION: Solenoid must be fully reassembled as the housing and internal parts are part of and complete the magnetic circuit. Place an insulating washer at each end of coil, if required.

ASCO Valves

ASCO

VALVE DISASSEMBLY FOR GENERAL CLEANING AND INSPECTION

(Refer to Figure 4)

Depressurize valve and turn off electrical power supply. It is strongly recommended that the valve be removed from the pipe line for ease of maintenance. If it is not practical to remove the valve from the pipe line and resetting of strokes is required or a new Spare Parts Kit is to be installed, consult factory for special bonnet tools which are available. When consulting the factory, be sure to include the valve catalog number and serial number from the nameplate on the valve.

1. Disassemble valve in an orderly fashion paying careful attention to exploded view provided for identification of parts.
2. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upward. For Explosion-Proof/Watertight Enclosure, refer to Installation and Maintenance Instructions Sheet, Form No. V-5381.
3. Unscrew solenoid base sub-assembly and remove bonnet gasket. For Explosion-Proof/Watertight Enclosure, a special bonnet adapter wrench is available, Order No. 102-649-1.
4. Unscrew disc guide caps (both ends) and remove disc guide cap gaskets, upper and lower springs and discs. CAUTION: Tag springs and discs as they are not interchangeable and must be returned to the original location. Tag upper and lower for ease of identification.
5. Remove end cap, end cap gasket and slip core/spring sub-assembly (A-C Construction) or core (D-C Construction) off the end of the valve lever and lift it out through solenoid base sub-assembly opening.
6. Inspect upper and lower valve seats but do not remove from valve body unless installing a complete Spare Parts Kit.
7. Clean all parts thoroughly and replace worn or damaged parts with a complete Spare Parts Kit. If a Spare Parts Kit is required, refer to section on "INSTALLATION OF NEW SPARE PARTS KIT" for complete rebuild. **IMPORTANT: Install all new parts. Do not retain any old parts when rebuilding valve. If only partial installation is made, valve malfunction may occur.**

VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
2. Lubricate all gaskets with Dow Corning's Valve Seal silicone lubricant or an equivalent high grade silicone grease.
3. Replace core/spring sub-assembly (A-C Construction) or core (D-C Construction) through solenoid base sub-assembly opening and engage with lever.
4. Install end cap gasket and end cap. Torque end cap to 55 ± 5 foot-pounds [74.6 ± 6.8 newton meters].
5. Replace bonnet gasket and solenoid base sub-assembly. Torque solenoid base sub-assembly to 175 ± 25 inch-pounds [19.8 ± 2.8 newton meters].
6. Replace solenoid enclosure and retaining cap or clip.
7. Install valve discs. If lapping is required, refer to "LAPPING SEATS AND DISCS" Section.
8. For stroke setting requirements (adjustment of valve discs) refer to "NEW SEAT AND DISC INSTALLATION" Paragraphs under "INSTALLATION OF NEW SPARE PARTS KIT" Section.
9. Install upper and lower springs. Refer to "NEW SPRING INSTALLATION" Section.
10. Replace disc guide cap gaskets and disc guide caps (both ends). Torque disc guide caps to 180 ± 15 inch-pounds [20.3 ± 1.7 newton meters].
11. After maintenance, operate the valve a few times to be sure of proper opening and closing. A metallic click signifies that the solenoid is operating.

NEW SPRING INSTALLATION (Refer to Figures 1 and 4)

When it is desired to change to a different form of flow or operating conditions, new upper and lower springs corresponding to the new requirements must be installed. Depressurize valve and turn off electrical supply. Remove the two disc guide caps and old springs. Install new springs in their proper location as indicated on the factory labeled tags. Replace disc guide caps and torque to 180 ± 15 inch-pounds [20.3 ± 1.7 newton meters]. The smaller diameter end of the Type "38" body springs faces the discs.

NOTE: The lower spring is always the weaker of the two and should always be located at the bottom. If the springs are installed in the wrong position, the valve will not function properly.

A method to determine which spring is the weaker is by placing the two springs on the shaft of a screwdriver or similar tool and compressing them. The spring which compresses to the "L" dimension (Figure 1) first is the weaker of the two springs and should be placed on the bottom.

MANUAL OPERATOR DISASSEMBLY AND REASSEMBLY

(Refer to Figure 4)

1. Unscrew stuffing box bonnet from valve body. (Be certain manual operator stem is fully retracted). Remove the manual operator intact.
2. Remove gasket from stuffing box bonnet.
3. Press or drive out knob/stem pin from operating knob and stem. CAUTION: When removing knob/stem pin from knob/stem sub-assembly, do not let parts fly apart.
4. Remove spring and slide stem out of stuffing box bonnet. CAUTION: Before sliding stem thru stuffing box bonnet, be certain there are no burrs on stem from removing knob/stem pin. Do not damage captive gasket seat ("O"-ring) in stuffing box sub-assembly.
5. All parts are now accessible for cleaning.
6. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
7. Torque stuffing box bonnet to 16 ± 3 foot-pounds [22.7 ± 4.1 newton meters].

SPARE PARTS KITS

Spare Parts Kits and Coils are available for ASCO valves. Parts marked with an asterisk (*) are supplied in Spare Parts Kits.

ORDERING INFORMATION FOR SPARE PARTS KITS

When Ordering Spare Parts Kits or Coils, Specify Valve Catalog Number, Serial Number and Voltage.

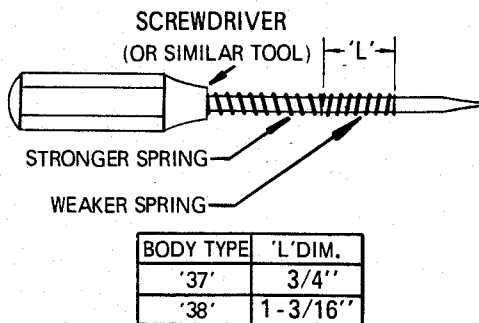


Figure 1. Method to Determine Weaker Spring

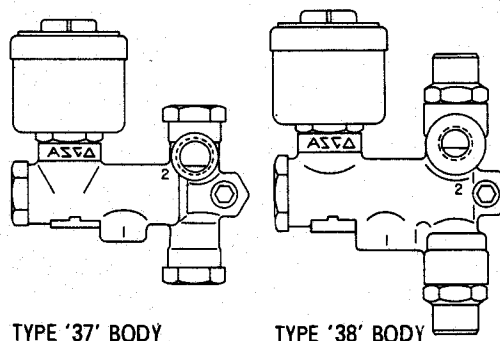


Figure 2. Identification of Body Type

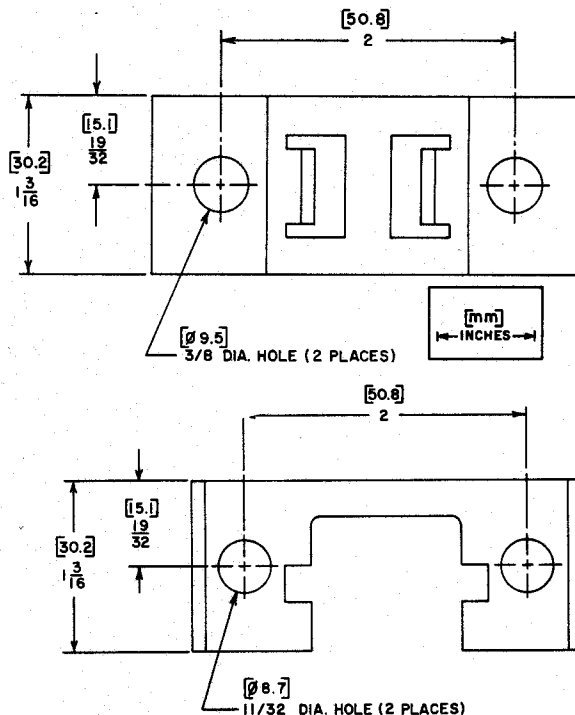


Figure 3. Mounting Bracket Dimensions

CONNECTION 'I' MACHINED INTO END CAP (WHEN MANUAL OPERATOR IS USED)

PARTS INCLUDED IN SPARE PARTS KITS*

A - C (ALTERNATING CURRENT) CONSTRUCTION SHOWN

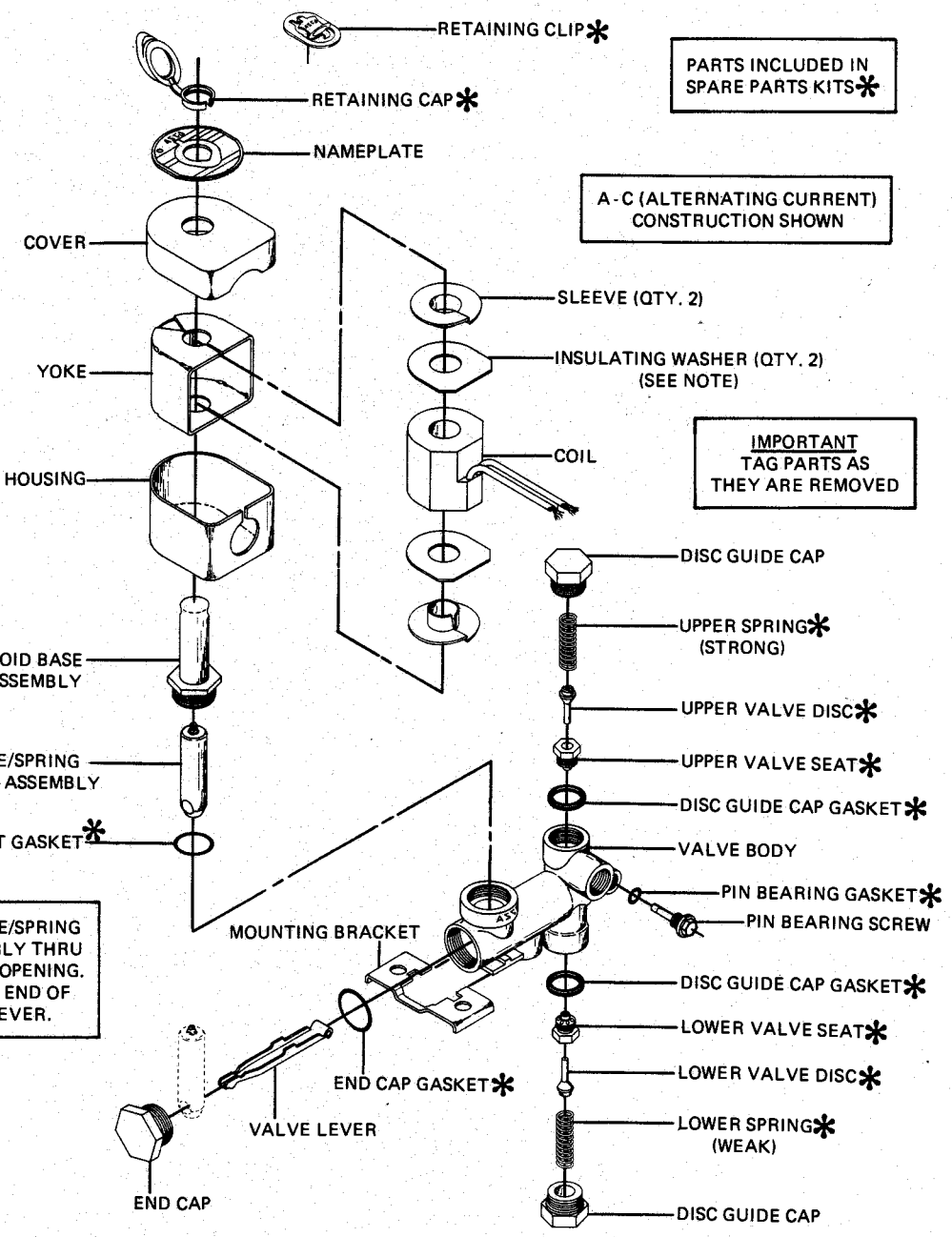
IMPORTANT TAG PARTS AS THEY ARE REMOVED

INSERT CORE/SRING SUB-ASSEMBLY THRU UPPER BODY OPENING. ENGAGE IN END OF VALVE LEVER.

PARTIAL VIEW OF BODY TYPE 38 TO SHOW VARIATION OF BODY CONFIGURATION AND PARTS.

TORQUE STUFFING BOX BONNET TO 16 ± 3 FOOT-POUNDS (22.7 ± 4.1 NEWTON METERS)

VIEW SHOWING MANUAL OPERATOR THREADED INTO CONNECTION 'I' ON UNDERSIDE OF VALVE BODY



NOTE: INSULATING WASHERS (2) ARE OMITTED WHEN A MOLDED COIL IS USED.

| PART NAME | TORQUE VALUE INCH-POUNDS | TORQUE VALUE NEWTON METERS |
|---------------------------------|--------------------------|----------------------------|
| PIN BEARING SCREW | 55 ± 5 | 6.2 ± .6 |
| SOLENOID BASE SUB-ASSEMBLY | 175 ± 25 | 19.8 ± 2.8 |
| VALVE SEATS (UPPER & LOWER) | 80 ± 8 | 9.0 ± .9 |
| DISC GUIDE CAPS (UPPER & LOWER) | 180 ± 15 | 20.3 ± 1.7 |
| END CAP | FOOT-POUNDS 55 ± 5 | 74.6 ± 6.8 |

Figure 4.

Bulletin 8300
 Body Type 37 - Metal to Metal Seating
 General Purpose Solenoid Enclosure Shown.
 For Explosion-Proof/Watertight Solenoid Enclosure Used on Bulletin 8302 etc., See Form No. V-5381

LAPPING SEATS AND DISCS

Depressurize valve and proceed in the following manner:

CAUTION: Tag upper and lower springs and upper and lower discs as they are not interchangeable and must be returned to original locations.

1. Apply a small amount of fine grinding compound to the beveled seating surface of the disc and insert the disc in the proper valve seat (do not remove seat from body). A fine grade of grinding compound Grit Size 900 is recommended. NOTE: If new seats and discs are being installed, lap them before installation in the valve. Be sure to install seats and discs in mated sets.
2. Use a screwdriver in the slot provided in the disc and grind by rotating the disc back and forth using light pressure. After an evenly lapped surface has been obtained, repeat the grinding operation on the other disc.
3. Wipe all parts clean of grinding compound.
4. Reassemble parts in reverse order of disassembly replacing discs and springs in original positions. Be sure the weaker spring is located at the bottom and stronger spring at the top. If discs or springs are incorrectly reassembled, the valve will not function properly. To determine the weaker spring, refer to "NEW SPRING INSTALLATION" Section.

INSTALLATION OF NEW SPARE PARTS KITS

Depressurize valve and turn off electrical power supply. Disassemble valve in an orderly fashion paying careful attention to exploded views provided for identification of parts. For ease of maintenance, valve should be removed from the pipe line. Spare Parts Kits include springs for all three forms of flow (F, G and U). Check the catalog number suffix on the nameplate to determine which form of flow you have. For example, a Form "F" valve is normally closed operation. When the correct springs have been chosen, immediately discard remaining two (2) sets of springs to avoid any difficulty.

1. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upward. For Explosion-Proof/Watertight Solenoid Enclosure, refer to Form V-5381 for disassembly.
2. Unscrew solenoid base sub-assembly and remove bonnet gasket. For Explosion-Proof/Watertight Solenoid Enclosure, a special wrench is required to remove the solenoid base sub-assembly. Wrench adapter Order No. 102-649-1.
3. Unscrew disc guide cap (both ends) and remove disc guide cap gaskets, upper and lower springs and discs.
4. Remove upper and lower valve seats using a 1/2 inch thin wall socket wrench.
5. Remove end cap and end cap gasket. Slip core/spring sub-assembly (A-C Construction) or core (D-C Construction) off the end of the valve lever and lift out through the solenoid base sub-assembly opening.
6. Remove pin bearing screw and pin bearing gasket.
7. Slide valve lever out through the end cap opening of the valve body.
8. All parts are now accessible for replacement. Clean all internal passageways. Install a complete Spare Parts Kit. **IMPORTANT: Install all new parts. Do not retain any old parts when rebuilding valve.**
9. Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.
10. Lubricate all gaskets with Dow Corning's Valve Seal silicone lubricant or an equivalent high grade silicone grease.
11. Insert valve lever and replace pin bearing gasket and pin bearing screw through the valve lever. Torque pin bearing screw to 55 ± 5 inch-pounds [6.2 ± .6 newton meters].
12. Position core/spring sub-assembly (A-C Construction) or core (D-C Construction) thru solenoid base sub-assembly opening and engage with valve lever. Install end cap gasket and end cap. Torque end cap to 55 ± 5 foot-pounds [74.6 ± 6.8 newton meters].
13. Replace bonnet gasket and solenoid base sub-assembly. Torque solenoid base sub-assembly to 175 ± 25 inch-pounds [19.8 ± 2.8 newton meters].
14. The stainless steel seats and discs (metal to metal seating) provided in the Spare Parts Kit have already been coined, however, lapping of the seats and discs is required. Refer to "LAPPING SEATS AND DISCS" Section. When lapping is complete, be sure to install seats and discs in mated sets.
15. Install upper and lower valve seats using a small amount of pipe compound on the seat threads to avoid possible leakage. Torque upper and lower valve seats to 80 ± 8 inch-pounds [9.0 ± .9 newton meters].
16. Replace solenoid enclosure and retaining cap or clip. For Explosion-Proof/Watertight Solenoid Enclosures, refer to Form No. V-5381.

NEW SEAT AND DISC INSTALLATION

17. New upper and lower seats and discs cannot be installed without making some minor adjustments. It is important that the stroke of the valve discs be set carefully in order to obtain the proper orifice opening and reliable operation of the valve. Check valve nameplate for the catalog number and refer to "Stroke Chart," Form No. V-5940 for stroke setting requirements. Refer to Figure 5 for the method of measuring the stroke. Spaces are provided on this sheet for your calculations.
18. Place the valve in a vertical and upright position. Install new upper disc and use a depth gauge to measure distances. NOTE: Solenoid and core/spring sub-assembly or core must be assembled in valve when strokes are measured.
19. With valve de-energized, measure Dimension "A." Dimension "A" is from the top of the valve body to the top of the upper disc as illustrated in Figure 5.
20. With valve energized, measure Dimension "B." Dimension "B" is from the top of the valve body to the top of the upper disc as illustrated in Figure 5.
21. Dimension "A" - "B" = upper disc stroke.

The differences between the two distances "A" minus "B" is the upper disc stroke. If the stroke is more than can be allowed in the "Stroke Chart," Form No. V-5940 (according to catalog number and body type), the end of the upper disc which contacts the valve lever must be ground off until the proper stroke is obtained. After grinding, the end of the disc stem must be crowned slightly and polished smooth.

22. Replace upper valve spring (strong spring), disc guide cap with disc guide cap gasket attached. Torque disc guide cap to 180 ± 15 inch-pounds [20.3 ± 1.7 newton meters].
23. Turn valve upside-down to install lower disc and follow the same procedure used in setting the upper disc stroke to set the lower disc stroke. In general, more adjustment grinding of disc stem is required to set lower disc stroke.
24. With valve energized, measure Dimension "C."
25. With valve de-energized, measure Dimension "D."
26. Dimension "C" - "D" = lower stem stroke.
27. When the strokes have been set in accordance with Figure 5 and the "Stroke Chart," Form No. V-5940, a gap will automatically be obtained between the lower disc stem and the lever when the solenoid is energized. This gap will assure proper operation of the valve.
28. Replace lower valve spring (weak spring), disc guide cap with disc guide cap gasket attached. Torque disc guide cap to 180 ± 15 inch-pounds [20.3 ± 1.7 newton meters].
29. After maintenance, operate the valve a few times to be sure of proper opening and closing. A metallic click signifies that the solenoid is operating.

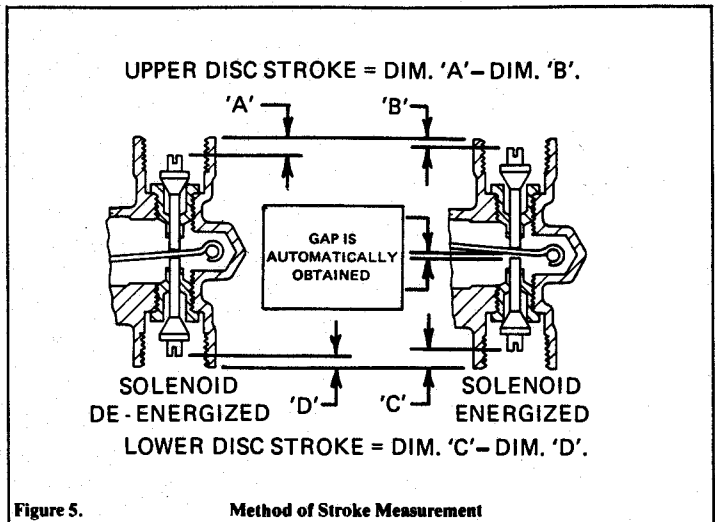


Figure 5. Method of Stroke Measurement

Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High Flow Valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
 - Car wash
 - Laundry equipment
 - Air compressors
 - Industrial water control
 - Pumps

Construction

| Valve Parts in Contact with Fluids | | |
|------------------------------------|----------------------|---------------------|
| Body | Brass | 304 Stainless Steel |
| Seals and Discs | NBR or PTFE | |
| Disc-Holder | PA | |
| Core Tube | 305 Stainless Steel | |
| Core and Plugnut | 430F Stainless Steel | |
| Springs | 302 Stainless Steel | |
| Shading Coil | Copper | Silver |

Electrical

| Standard Coil and Class of Insulation | Watt Rating and Power Consumption | | | | Spare Coil Part Number | | | |
|---------------------------------------|-----------------------------------|-------|------------|-----------|------------------------|--------|----------------|--------|
| | DC Watts | AC | | | General Purpose | | Explosionproof | |
| | | Watts | VA Holding | VA Inrush | AC | DC | AC | DC |
| F | - | 6.1 | 16 | 40 | 238210 | - | 238214 | - |
| F | 11.6 | 10.1 | 25 | 70 | 238610 | 238710 | 238614 | 238714 |
| F | 16.8 | 16.1 | 35 | 180 | 272610 | 97617 | 272614 | 97617 |
| F | - | 17.1 | 40 | 93 | 238610 | - | 238614 | - |
| F | - | 20 | 43 | 240 | 99257 | - | 99257 | - |
| F | - | 20.1 | 48 | 240 | 272610 | - | 272614 | - |
| H | 30.6 | - | - | - | - | 74073 | - | 74073 |
| H | 40.6 | - | - | - | - | 238910 | - | 238914 |

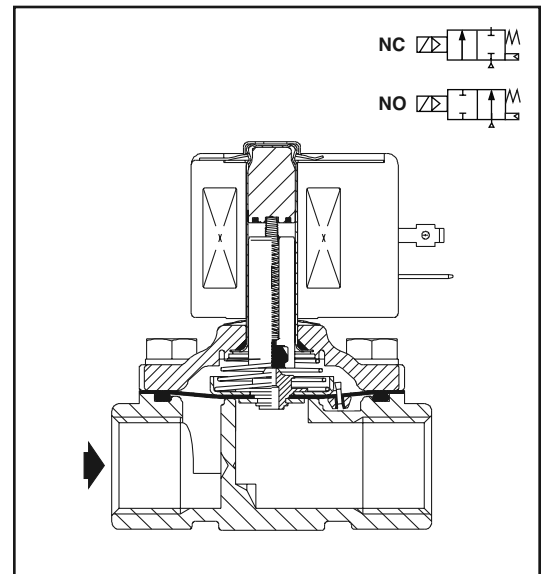
Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.
 Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.

(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
 See *Optional Features Section* for other available options.



Nominal Ambient Temp. Ranges

RedHat II/
 RedHat AC: 32°F to 125°F (0°C to 52°C)

RedHat II DC: 32°F to 104°F (0°C to 40°C)
 RedHat DC: 32°F to 77°F (0°C to 25°C)
 (104°F/40°C occasionally)

Refer to *Engineering Section* for details.

Approvals

CSA certified. RedHat II meets applicable CE directives.

Refer to *Engineering Section* for details.

Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES DIAPHRAGM TYPE – 3/8, 1/2 AND 3/4 NPT NORMALLY OPEN OPERATION

BULLETINS

8210

8211

I&M No.V5983R3

DESCRIPTION

Bulletin 8210 valves are 2-way, normally open internal pilot operated solenoid valves. Valve bodies and bonnets are of brass or stainless steel construction. Standard valves have a General Purpose, NEMA Type 1 Solenoid Enclosure.

Bulletin 8211's are the same as the 8210's except the solenoids are equipped with an enclosure which is designed to meet NEMA Type 4 - Watertight, NEMA Type 7 (C or D) Hazardous Locations - Class I, Groups C or D and NEMA Type 9 (E, F or G) Hazardous Locations - Class II, Groups E, F or G. Installation and Maintenance Instructions for Explosion-Proof/Watertight Solenoid Enclosures are shown on Form No. V-5709.

OPERATION

Normally Open: Valve is open when solenoid is de-energized. Valve closes when solenoid is energized.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

TEMPERATURE LIMITATIONS

For maximum valve ambient and fluid temperatures, refer to chart below. For higher ambient and fluid temperature limitations, consult factory. Check catalog number on nameplate to determine maximum temperatures.

| Construction | Coil Class | Catalog Number Prefix | Maximum Ambient Temp. °F | Maximum Fluid Temp. °F |
|---|--------------|-----------------------|--------------------------|------------------------|
| A-C Construction (Alternating Current) | A | None | 77 | 200 |
| | F | FT | 122 | 200 |
| | H | HT | 140 | 200 |
| D-C Construction (Direct Current) | A, F or H | None, FT or HT | 77 | 180 |

POSITIONING

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertical and upright so as to reduce the possibility of foreign matter accumulating in the core tube area.

MOUNTING

For mounting bracket (optional feature) dimensions, refer to Figure 1.

PIPING

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening the pipe, do not use valve as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point.

IMPORTANT: For the protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

WIRING

Wiring must comply with Local and National Electrical Codes. Housings for all solenoids are provided with connections or accommodations for 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by removing the retaining cap or clip. **CAUTION:** When metal retaining clip disengages, it will spring upward. Rotate enclosure to desired position. Replace retaining cap or clip before operating.

NOTE: Alternating Current (A-C) and Direct Current (D-C) solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid including the solenoid base sub-assembly, core, plugnut assembly and coil.

SOLENOID TEMPERATURE

Standard catalog valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched with the hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

MAINTENANCE

WARNING: Turn off electrical power supply and depressurize valve before making repairs. It is not necessary to remove the valve from the pipe line for repairs.

CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary depending on media and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. Clean valve strainer or filter when cleaning solenoid valve.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate the valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on media and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic click signifies the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires or splice connections.
2. **Burned-Out Coil:** Check for open-circuited coil. Replace coil if necessary.
3. **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
5. **Excessive Leakage:** Disassemble valve and clean all parts. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

COIL REPLACEMENT (Refer to Figure 1)

Turn off electrical power supply and disconnect coil lead wires. Proceed in the following manner:

1. Remove retaining cap or clip, spacer, nameplate and housing. CAUTION: When metal retaining clip disengages, it will spring upward.
2. Slip spring washer, insulating washer, coil and insulating washer off the solenoid base sub-assembly. Insulating washers are omitted when a molded coil is used.
3. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.

CAUTION: Solenoid must be fully reassembled as the housing and internal parts are part of and complete the magnetic circuit. Place an insulating washer at each end of the coil, if required.

VALVE DISASSEMBLY

Depressurize valve and turn off electrical power supply. For brass construction, refer to Figure 2. For stainless steel construction, refer to Figure 3. Proceed in the following manner:

1. Disassemble valve in an orderly fashion paying careful attention to exploded views provided for identification of parts.
2. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upward.
3. Unscrew solenoid base sub-assembly and remove core, plugnut gasket, plugnut assembly and solenoid base gasket.
4. For stainless steel construction, remove adapter and adapter gasket.
5. Remove bonnet screws (4), valve bonnet, disc holder sub-assembly, disc holder spring, diaphragm/spring sub-assembly and body gasket.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.
2. Replace body gasket and diaphragm/spring sub-assembly. Locate bleed hole in diaphragm/spring sub-assembly approximately 45° from valve outlet. NOTE: Should diaphragm/spring sub-assembly become disassembled, be sure to replace the diaphragm/spring support with lip facing upward towards the valve bonnet.
3. Replace disc holder spring and disc holder sub-assembly.
4. Replace valve bonnet and bonnet screws. Torque bonnet screws in a crisscross manner to 95 ± 10 inch-pounds.

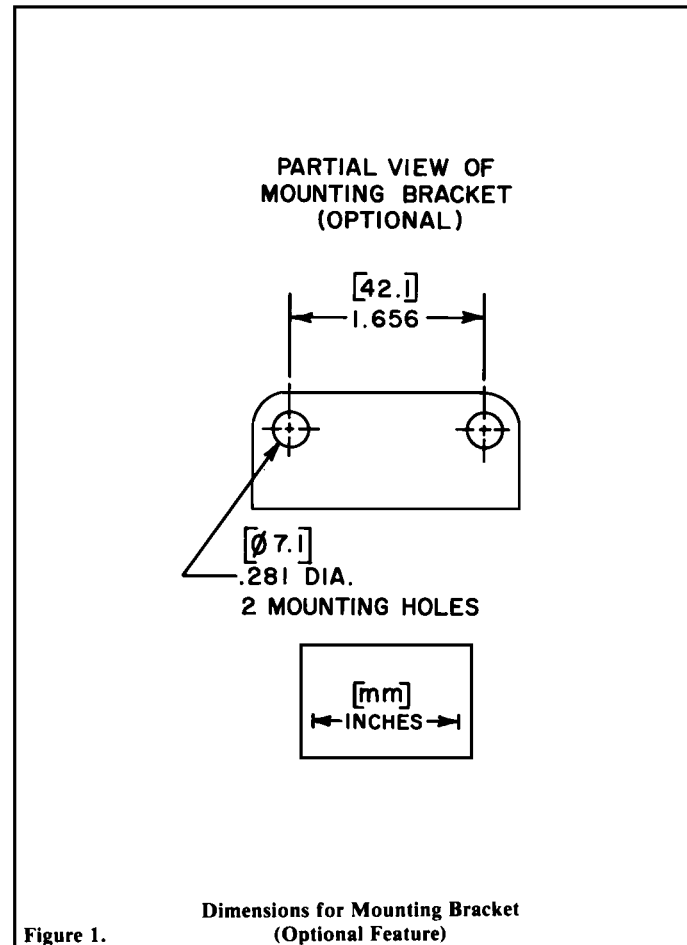
5. For stainless steel construction, replace adapter gasket and adapter. Torque adapter to 175 ± 25 inch-pounds.
6. Install solenoid base gasket, plugnut assembly and plugnut gasket. Position core (small end up for A-C Construction) on plugnut assembly. For D-C Construction, be sure plugnut assembly and core are installed with mated ends together.
7. Replace solenoid base sub-assembly and torque to 175 ± 25 inch-pounds.
8. Replace solenoid enclosure and retaining cap or clip.
9. After maintenance, operate the valve a few times to be sure of proper opening and closing.

SPARE PARTS KITS

Spare Parts Kits and Coils are available for ASCO valves. Parts marked with an asterisk (*) are supplied in Spare Parts Kits.

ORDERING INFORMATION FOR SPARE PARTS KITS

When Ordering Spare Parts or Coils, Specify Valve Catalog Number, Serial Number and Voltage.



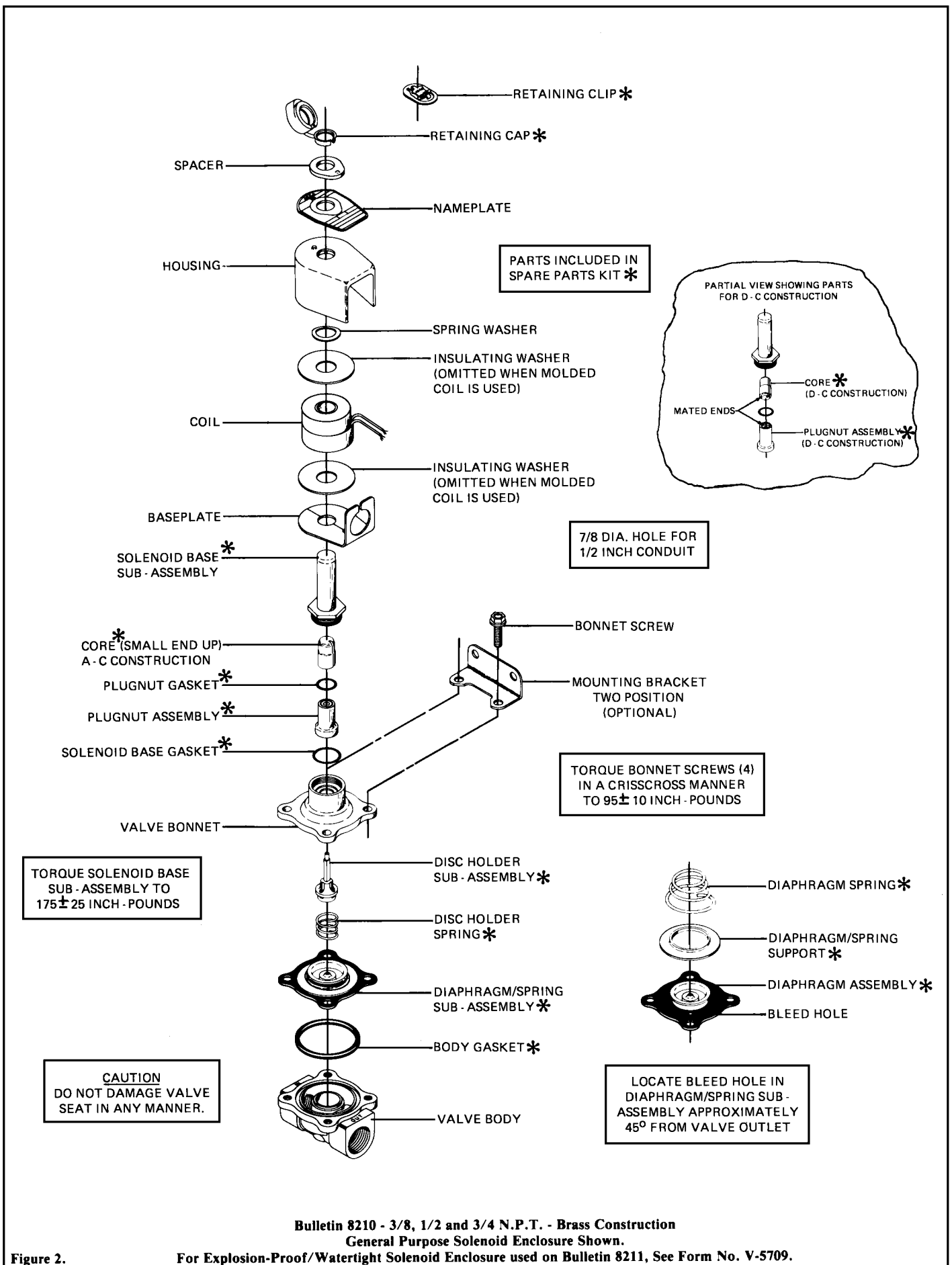
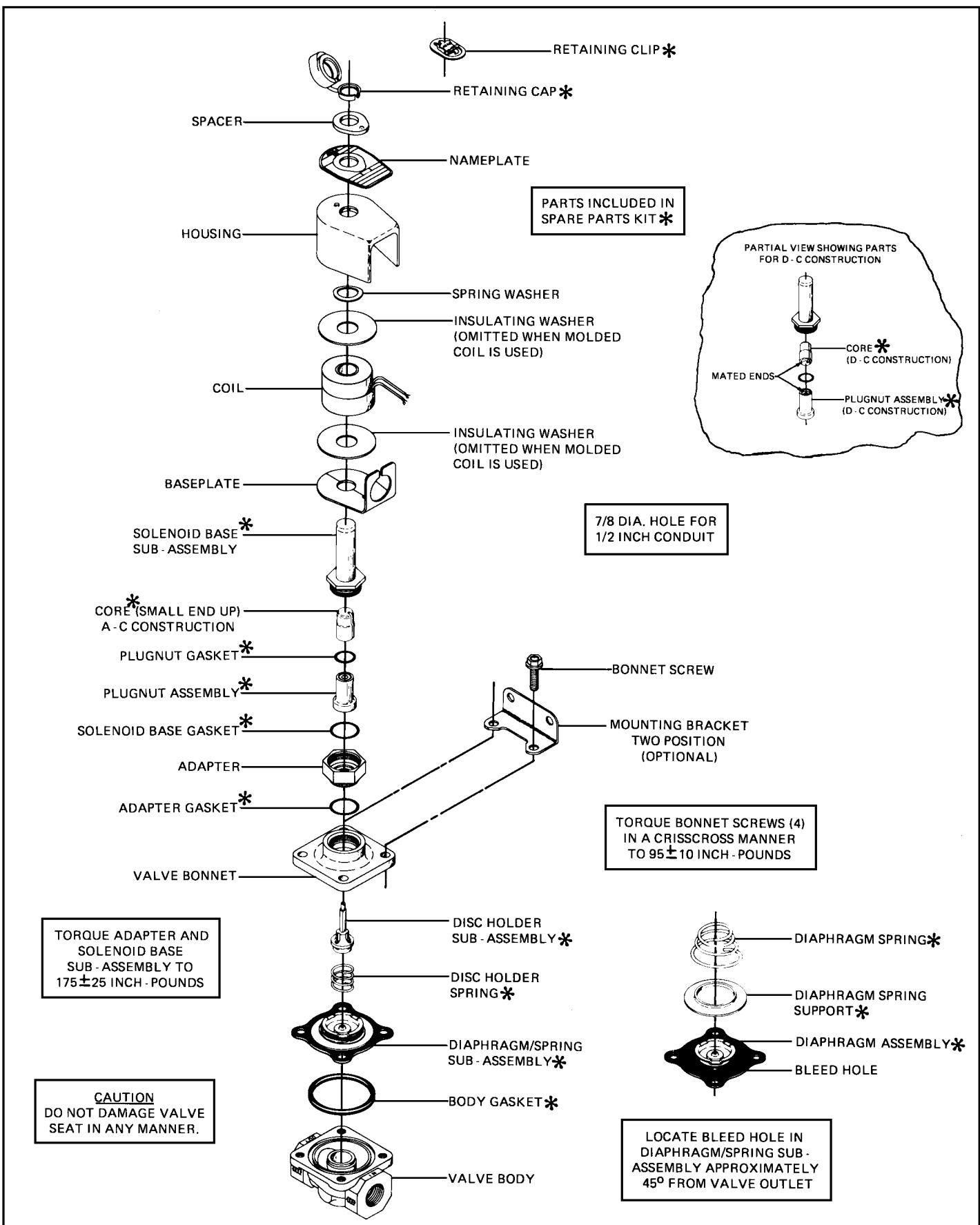


Figure 2.

For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, See Form No. V-5709.



**Bulletin 8210 - 1/2 and 3/4 N.P.T. - Stainless Steel Construction
General Purpose Solenoid Enclosure Shown.**

Figure 3. For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, See Form No. V-5709.

STRAINER

Model Number: 5F-2

Sizes: ½" – 1"

Located: On any external piping

Purpose: To protect external piping and control devices from fouling or damage from foreign particles

Screen: Cylindrical Dutch weave stainless steel wire mesh

Piping Connection: Standard pipe thread

Operation

1. Water enters the cylindrical screen (#2) from the top and passes out through the sides of the cylinder.
2. Any particle too large to pass through .012 inch openings gets trapped in the cylinder, where, unless there is unusual turbulence, they settle at the bottom.

Recommendation

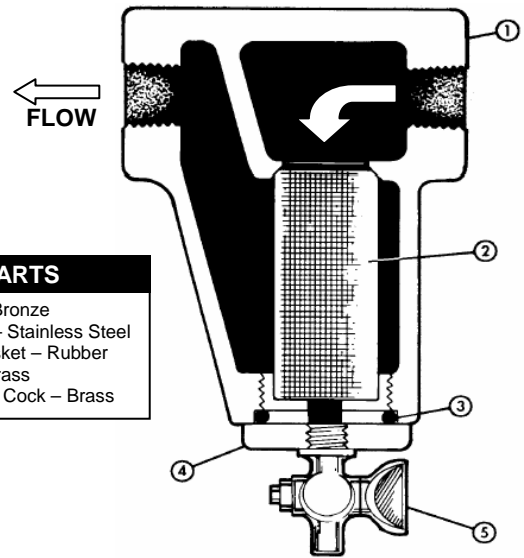
1. Strainer should be "blown down" frequently to remove collected foreign material from the sediment chamber.
2. Strainer screen should be removed occasionally for inspection and thorough cleaning.

Note

1. To clean without shutting down the line, open the flush cock (#5) in the bottom cap (#4) for several seconds.
2. To remove the screen (#2), which requires shutting down the line, unscrew the bottom cap assembly (#5).

Option

Two strainers installed in parallel (with the appropriate isolation valves) to permit uninterrupted service while cleaning.



PARTS

1. Body – Bronze
2. Screen – Stainless Steel
3. Cap Gasket – Rubber
4. Cap – Brass
5. Flushing Cock – Brass

NEEDLE VALVE

Sizes: One size fits all piston valves

Primarily Controlled By: Manually Adjusted

Located: On external control circuit of the main valve

Purpose: To limit flow in and out of the operating chamber

Standard Shipped Adjustment:

Course Needle: 5/6 to 2 turns off the seat

Fine Needle: Based on individual specifications

Operation

The simple construction reliably limits maximum flow through the external piping, depending on the position of the adjustable stem/needle (#4) relative to the seat.

1. When the needle (#4) is adjusted counter-clockwise to a raised position,
 - a. More water can pass through the needle valve.
 - b. Water enters (leaves) the operating chamber more quickly.
 - c. The main valve piston moves up and down more quickly.
2. When the needle (#4) is adjusted clockwise to a lowered position,
 - a. Less water can pass through the needle valve.
 - b. Water enters (leaves) the operating chamber more slowly.
 - c. The main valve piston moves up and down more slowly.

Adjustment

To adjust needle valve, which can be done without shutting down the main valve:

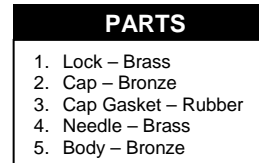
1. Remove the hex cap (#2) and lock (#1).
2. With a screw driver;
 - a. Turn the needle (#4) counter-clockwise to raise it
 - b. Turn the needle (#4) clockwise to lower it
3. Once the optimum position is determined, no further adjustment of the needle should be required.

Note

It is advisable to occasionally remove the cap (#2) and lock (#1) and change the position of the needle (#4) momentarily to insure against gradual plugging.

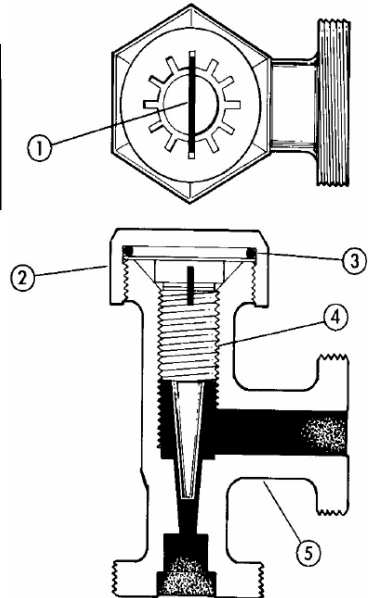
Option

Two separate needle valves on one main valve – Provides independent control of opening and closing speeds.



PARTS

1. Lock – Brass
2. Cap – Bronze
3. Cap Gasket – Rubber
4. Needle – Brass
5. Body – Bronze



LIMIT SWITCH

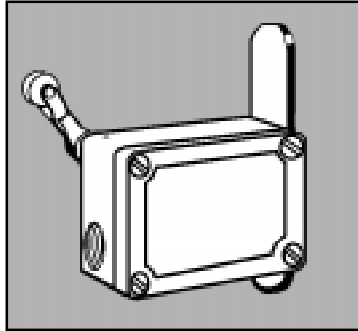
Located:

Wherever an electric switch control is needed.

Contact: 10 AMP

Purpose:

1. To signal if the valve is opened or closed.
2. To start or stop allied equipment.

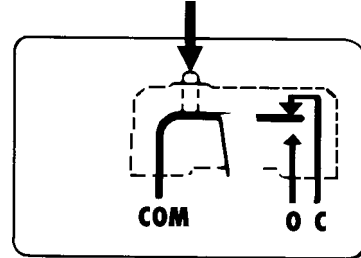


Operation

Performs as an on/off switch.

ROSS ADVANTAGE

Because it is waterproof, the switch can be used anywhere.



- O - Normally open contact
- C - Normally closed contact
- COM - Common

Note: A double pole switch (2 N.O. and 2 N.C.) contacts can be supplied as an extra.

Factory: Telephone (518) 274-0961; Fax (518) 274-0210

Limit and Enclosed Switches

OP Series

Enclosed Switches



FEATURES

- Cast aluminum housing
 - Mounts from 4 sides
 - Cover seal, captive cover screws
 - Momentary contact
 - UL Recognized, file #E12252
 - CSA Certified, file #LR57325
 - Grounding screw
 - NEMA 1, 3*, 4* and 13*
- (* Except Q-plunger and high temperature types)

ELECTRICAL RATING

| Circuitry | Electrical Rating |
|---------------------------------|--|
| Single-pole Double-throw | A UL/CSA Rating: 15 amps, 125, 250 or 480 VAC; 1/8 Hp, 125 VAC; 1/4 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC. |

OP enclosed switches are precision snap-action switches sealed in rugged cast aluminum housings. Cover and shaft seals keep out moisture and other contaminants on rotary operated switches. The plungers in the Q-plunger version are not sealed.

Refer to page A123 for explosion-proof Type EX switches, which are dimensionally interchangeable with OP switches.

N = Newtons

* Actuation is designated as CW (clockwise) or CCW rotation, when looking at the switch nameplate.

† Choice of levers available for use with OP-AR20: **6PA5-EX** (non-sparkling roller), **6PA6-OP** (steel roller), **6PA127-EX** (nylon roller), **6PA130-EX** (CW), **6PA142-EX** (CCW), and **6PA136-EX** (Aluminum rod).

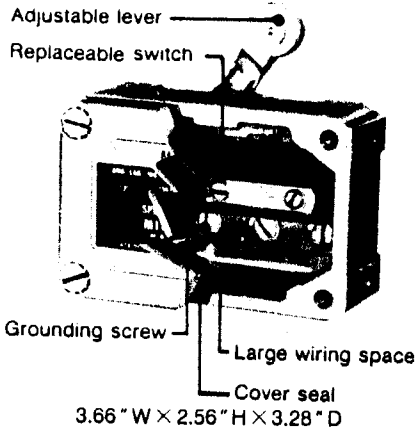
Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

| Description | Elec. Rating | Catalog Listing | O.F. | P.T. | O.T. | D.T. |
|--|--------------|-----------------|-----------------------------|----------------------|------|------------------------|
| | | | | max. mm in. | max. | max. mm in. |
| Roller Lever is field adjustable through 360° | A | OP-AR | 2,22-5,56 N .5-1.25 lbs. | 5,56 .219 (8°) | 90° | 0,18 .007 (.25°) |

OP Enclosed Limit switches

MICRO SWITCH, a Honeywell division



GENERAL INFORMATION

Type OP enclosed switches are precision snap-action switches sealed in rugged cast aluminum housings. Cover and shaft seals provide a degree of protection from moisture and other contaminants on rotary operated switches. The plungers in the Q-plunger versions are not sealed.

Explosion-proof Type EX switches are dimensionally interchangeable with OP switches.

Additional actuators and circuitries are listed in Catalog 40.

For replacement parts and mounting brackets see page B15.

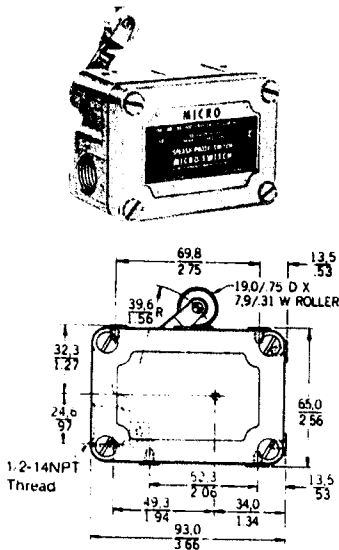
FEATURES

- Cast aluminum housing
- Mounts from 4 sides
- Cover seal, captive cover screws
- Momentary contact
- UL listed and CSA certified
- Grounding screw
- Complies with NEMA 1, 3*, 4*, and 13* (*Except Q-plunger types)

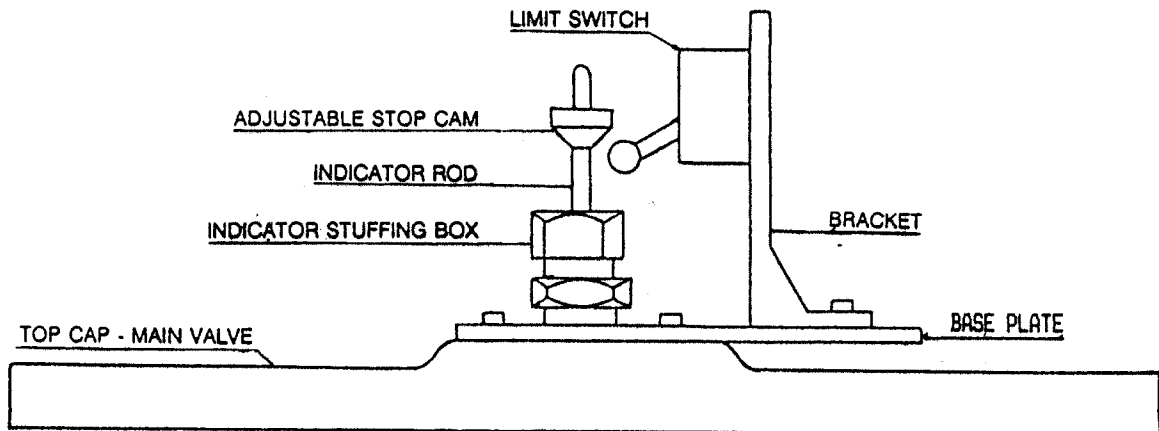
Characteristics:

- O.F. — Operating Force;
- P.T. — Pretravel;
- O.T. — Overtravel;
- D.T. — Differential Travel;
- O.P. — Operating Position

ROLLER LEVER ACTUATED SWITCHES ORDER GUIDE



| Description | | Electrical Data and UL Code | Catalog Listing | O.F. | P.T. max. mm in. | O.T. max. | D.T. max. mm in. |
|---|--|-----------------------------|-----------------|----------------------------|------------------|-----------|------------------|
| Roller Lever is field adjustable through 360° | CW actuation* SPDT. | 15A L96 | OP-AR | 2,22-5,56N .5-1.25 lbs. | 5,56 .219 (8°) | 90° | 0,18 .007 (.25°) |
| | CW actuation* High capacity. SPDT. | 20A L23 | OPA-AR | 3,34-8,90 N .75-2 lbs. | 5,56 .219 (8°) | 25° | 0,3 .012 (.4°) |
| | CW actuation* DPDT. | 10A L59 | OPD-AR | 2,22-6,67 N .5-1.5 lbs. | 4,78 .188 | 25° | 2,77 .109 (4°) |
| | CCW actuation* SPDT. | 15A L96 | OP-AR30 | 1,11 N max. 2.5 lbs. max. | 1,65 .065 (3.5°) | 25° | 0,18 .007 (.25°) |
| | CCW actuation* Basic switch plunger held depressed (normal position) DPDT. | 10A L59 | OPD-AR30 | 12,2 N max. 2.75 lbs. max. | 5,56 .219 (8°) | 25° | 2,77 .109 (4°) |



LIMIT SWITCH ASSEMBLY

* Note - Dimension 'I' Minimum Headroom Required - 12"

EX Explosion-Proof and OP Enclosed Switches

ADJUSTING ROLLER ARMS

The roller lever assembly is adjustable through 360° at any of 1,980 positive lock positions at intervals of approximately 0.2°.

To adjust the roller lever to the desired position, hold the hexagon washer with a wrench and loosen lock nut sufficiently to disengage the serrations. Hold shaft in position by means of the hexagon washer so that no torque will be applied to the internal parts of the unit when the lock nut is tightened or loosened. Failure to do so may result in damage to the enclosed switching mechanism.

Moving lever one serration forward or backward with respect to serrations on fluted washer changes the position of the lever approximately 8.2° (see sketch below).

Moving lever and fluted washer, as a unit, one serration forward or backward with respect to serrations on the hexagon washer changes position of the lever 8°. Moving the lever one serration in one direction, and the lever and fluted washer, as a unit, one serration in the other direction, changes position of the arm approximately 0.2°.

After positioning lever arm, tighten lock nut sufficiently to prevent slippage of arm, but avoid over tightening.

Located:

Wherever an electric switch control is needed.

Purpose:

1. To signal if the valve is opened or closed.
2. To start or stop allied equipment.

REPLACING BASIC SWITCH

1. **NOTICE** - Disconnect power supply circuit before opening switch.
2. Remove cover of housing, disconnect the lead-in wires, loosen screws holding the basic switch, then remove the basic switch.
3. Place replacement switch in the insulator, insert the screws, and place basic switch in the housing.
4. Tighten the screws and connect the lead-in wires.
5. Be sure small compression spring is returned to its position between the top of the basic switch and the internal lever (or above internal lever in the case of the CCW actuated switches).

NOTICE

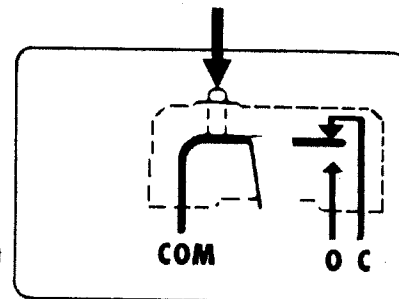
Excessive tightening will also deform the hexagon serrated washer and cause lever assembly to bind.

WARRANTY/REMEDY

Seller warrants its products to be free from defects in design, material and workmanship under normal use and service. Seller will repair or replace without charge any such product it finds to be so defective on its return to Seller within 18 months after date of shipment by Seller. **The foregoing is in lieu of all other expressed or implied warranties (except of title), including those of merchantability and fitness for a particular purpose.** The foregoing is also Purchaser's sole remedy and is in lieu of all other guarantees, obligations, or liabilities or any consequential, incidental, or punitive damages attributable to negligence or strict liability, all by way of example.

While we provide application assistance on MICRO SWITCH products, both personally and thru our literature, it is up to the customer to determine the suitability of the product in the application.

Because it is waterproof, the switch can be used anywhere.

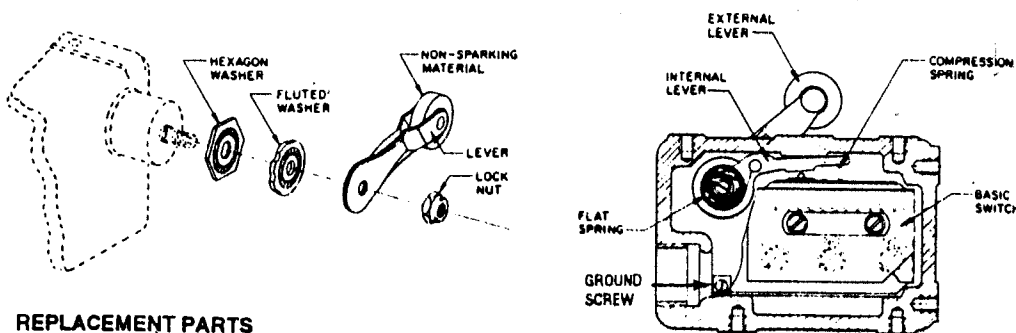


- O - Normally open contact
- C - Normally closed contact
- COM - Common

Note: A double pole switch (2 N.O. and 2 N.C.) contacts can be supplied as an extra.

Operation

Performs as an on/off switch.



A ground screw is provided for convenient grounding. See drawing.

REPLACEMENT PARTS

| Catalog Listing | Description | Elec. Rtg. | Basic Switch Unit | External Actuator | Internal Lever | Springs | Mounting Bracket |
|-----------------|---|------------|-------------------|-------------------|----------------|----------|------------------|
| OP-AR | Roller arm, CW actuation, SPDT, 15 amp capacity | A | BZ-2R-P4 | 6PA6-OP* | 33PA2-OP | 33PA7-EX | 15PA85-E |
| OPD-AR | Roller arm, CW actuation, DPDT, 10 amp capacity | C | DT-2R4-A7 | 6PA6-OP* | | 33PA6-EX | 15PA65-E |

ROSS GLOBE VALVE

PREVENTIVE MAINTENANCE

Intervals of inspection vary from valve to valve. Type of valve, quality of water being handled, rates of flow, operating pressures, and past maintenance practices all have a bearing on the length of service between overhauls.

So some recommendation may guide the operator, we suggest periodic inspections in order to check for proper valve operating pressures, as well as any visual leaks. Should the operator encounter any external leakage, or find any abnormalities in the operating pressures resulting from the operation of the valve, the valve should be scheduled for service.

EVERY TWO (2) MONTHS:

1. Flush the strainer via the flushing cock.
2. Flush the needle valve by turning then needle *clockwise* ½ turn, *counter-clockwise* 2 turns, then *clockwise* 1-1/2 turns to original setting.
3. Visually inspect for leaks around the indicator rod, bottom cap/differential vent hole, or pilot valves (hydraulic & /or solenoid).
4. Inspect drain line connection.

EVERY FOUR (4) MONTHS:

1. Remove and inspect strainer screen.
2. Remove and inspect needle valve, being sure to take note of the needle position away from the seat (number of turns).
3. Same visual inspection as above.

Important: Condition of the main valve packing can be accurately gauged by observing the leakage through the bottom vent hole "C". Negligible leakage usually indicates serviceable packing.

Lubrication: None Required.

Spare Parts: None required, recommended, or supplied unless specified. Under normal operating conditions, no spare parts would be necessary within five (5) years of service. The standard repair kit for Ross valves are in stock at the factory, and available for immediate shipment upon receipt of order with valve serial number (located on metal tag pinned to the top cap of the main valve).

ROSS GLOBE VALVE
INSPECTION - SERVICE RECORD

VALVE LOCATION/I.D. _____

SIZE _____ MODEL _____ SERIAL NO. _____

VALVE - OPEN ~ CLOSED ~ INDICATOR ROD EXPOSED ___ INCHES ABOVE STUFFING BOX CAP

MAIN VALVE OPERATED MANUALLY YES ~ ... NO ~

OPERATING PRESSURES - INLET (SUPPLY) _____ OUTLET (DOWNSTREAM) _____

EXTERNAL LEAKS NONE SLIGHT MAJOR

..... INDICATOR STUFFING BOX ~ ~ ~

..... BOTTOM CAP VENT HOLE ~ ~ ~

..... DIAPHRAGM VENT-HYDRAULIC PILOT ~ ~ ~

..... SOLENOID PILOT EXHAUST PORT ~ ~ ~

OTHER CONDITIONS _____

STRAINER FLUSHED YES ~ NO ~

..... SCREEN EXAMINED . YES ~ NO ~ CLEANED ONLY ~

..... SCREEN CONDITION GOOD ~ POOR ~ INSTALLED NEW SCREEN ~

NEEDLE VALVE(S) (EXAMINE NEEDLE & SEAT FOR WEAR)

..... OPENING CONTROL . CLEANED ~ ADJUSTED ~ SET POINT _____

..... CLOSING CONTROL CLEANED ~ ADJUSTED ~ SET POINT _____

HYDRAULIC PILOT ADJUSTED NO ~ YES ~ _____ TURNS

..... CLOCKWISE ~ .. COUNTER-CLOCKWISE ~ SET POINT _____

..... REBUILT AT FACTORY DATE _____ . IN FIELD DATE _____

..... NEW HYDRAULIC PILOT REPLACEMENT DATE _____

SOLENOID - COIL TESTED NO ~ YES ~ REPLACED ~

..... SEATS - INSPECT & CLEAN _____

..... REBUILT AT FACTORY DATE _____ . IN FIELD DATE _____

..... NEW SOLENOID REPLACEMENT DATE _____

MAIN VALVE INTERNAL CONDITION -

..... MAIN CYLINDER (14) _____

..... BOTTOM CAP CYLINDER (23) _____

..... SEAT DISC/SUPPORT/RING _____

..... BODY TAP CONNECTIONS _____

..... MAIN VALVE REPACKED _____ DATE _____

ACTION RECOMMENDED _____

REPORT BY _____ DATE _____

**ANALYSIS FOR DETERMINING CONDITION RESPONSIBLE
FOR AND CORRECTION OF FAULTY OPERATION**

No. 1 - WHEN VALVE DOES NOT CLOSE

Cause (a): Solenoid Pilot (normally closed) failure – seats fouled.

Correction: Inspect, clean and regrind seats.

Cause (b): Solenoid Pilot (normally open) failure may be result of fouled seats or burned out coil.

Correction: Inspect, clean and regrind seats or replace coil.

Cause (c): Fouled Needle Valve.

Correction: Flush Needle Valve, remove Needle Valve cap and locking device; and with screw drive, turn need *counter-clockwise* 3 full turns. After 2 to 3 minutes of flushing, restore needle to its original position. This correction should be made while water passes through valve.

Cause (d): Sticks or stones lodged under or on seat of Main Valve.

Correction: Dismantle main valve and remove.

Cause (e): Worn leathers - Main Valve.

Correction: Replace leathers.

Cause (f): Isolation valve (18) is closed.

Correction: Open isolation valve.

No. 2 - WHEN VALVE WILL NOT OPEN

Cause (a): Normally Closed Solenoid Pilot may have seats fouled or coil burned out, while Normally Open Solenoid Pilot may have fouled seats.

Correction: Inspect, clean, regrind seats, or replace coil.

Cause (b): Leakage by main cup leathers (13).

Correction: Replace worn leather cups.

Cause (c): Main stem binding due to dirt or sediment lodging behind cup leathers.

Correction: Clean main stem and valve thoroughly.

REPAIR INSTRUCTIONS - GLOBE BODY VALVES

When entering a valve pit to inspect a valve, all regulations regarding Confined Space Entry should be observed.

So some recommendation may guide the operator, we suggest periodic inspections in order to check for proper valve operating pressures as well as any visual leaks. Should the operator encounter any external leakage or find any abnormalities in the operating pressures which appear to be caused by the valve, the valve should be scheduled for service.

A reliable indication of internal packing condition can be obtained by observing any leakage from the vent hole in the center of the bottom cap. When leakage becomes significant, packing replacement should be made. As a general statement, the overall average life of a set of packings is 7 to 10 years. This may vary considerably because of specific operating conditions.

After observing pressures and inspecting for external leakage, the flush cock on the strainer should be opened momentarily to remove accumulated material. The needle valve cap should be removed and the needle closed 1/2 turn, opened 1 full turn, and then closed 1/2 turn to its original position.

STEPS FOR INTERNAL REPAIRS:

All repairs and parts replacement may be made without removing the valve from the line. Internal repairs are made by removing the top cap of the valve. All internals are accessible through the top.

Shut inlet main line isolation valve, then shut outlet main line isolation valve. Open gauge cocks to de-pressurize the valve.

Remove indicator rod by inserting a nail through hole and unscrewing. Do not pull through stuffing box. Then remove top cap bolts and top cap. Be careful not to bend indicator rod.

In 8" and larger valves, withdraw piston by either removing two 3/8" bronze bolts in top stem nut and installing lifting device (horseshoe shaped piece of steel with two holes) over nut; or by looping a cable or nylon rope around these bolts. **Be sure lifting device is secure before removing piston.** In 4" and 6" valves, a threaded eyebolt should be screwed in the indicator rod hole.

Inspect both main bushing (Part No. 14) and bottom cylinder (Part No. 23) for mineral build-up or scoring. Smooth with emery or replace if necessary. Inspect seat ring for damage. Repair as necessary.

Secure main piston on a pipe threading stand (or lay piston on floor on rags or a similar cushioning material). Loosen top stem nut (Part No. 15) which holds the cup plate assembly. Remove cup plate bolts, nuts and copper washers on 8" cups and larger. Replace the leather cups (one faces up, one faces down). Re-install with new packings in the reverse order as outlined above.

Caution - The clamping bolts should be tight so that the packings are held securely and no leak occurs. Do not over-tighten so that the packing is deformed, however. All cup packings are impregnated with lubricants so that no external lubrication is necessary or desirable.

To replace the seat packing, it is necessary to determine if the valve is constructed with a "sliding" or a "flat" type seat. The sliding type seat has the seal or seat packing clamped in the valve body underneath the iron wall that separates the inlet and outlet valve chambers. It consists of a flanged packing held in place by a split bronze seat support ring. The lip of the packing "looks down" and care should be taken that the packing is concentric with the valve bore before the clamping bolts are tightened. In the "flat" type seat, the seat packing is located on the valve piston, where it is clamped between two plates and held by a stem nut (Part No. 7). Removal of this nut allows the plates to be separated and the packing replaced.

Replacement of the bottom cups (Part No. 5) is accomplished by removing the bottom stem lock nut (Part No. 6) and the flanged bottom guide nut (Part No. 3). Install the seals with the lip of both cups "looking up". Again, when re-assembling, be careful not to over tighten so that the cups are deformed.

Re-insert the piston being careful not to crimp the lower main cup when it enters the main bushing. The piston should move freely and drop of its own weight.

Replace the top cap and control piping (being sure to thread in the indicator rod), then restore water pressure. Be sure to open the discharge isolation valve first so that high inlet pressure is not trapped against a closed outlet valve.

All replaceable packings and gaskets are stock items and may be ordered as a repair kit for valve serial number _____. They are available for regular UPS delivery or next day service.

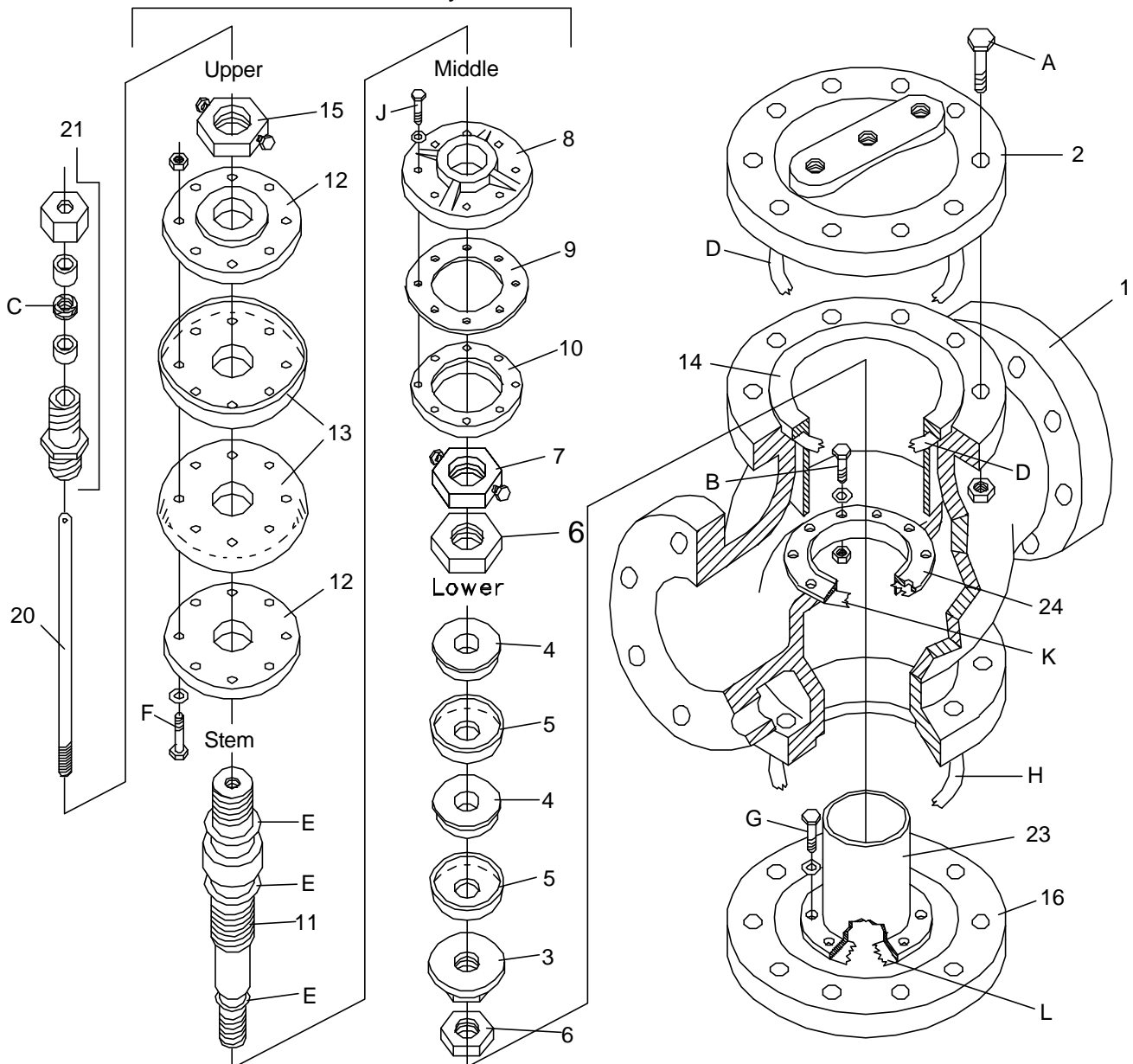
All spare parts are available from: Ross Valve Mfg. Co., Inc., 6 Oakwood Avenue, Troy, New York, 12180
Phone: (518) 274-0961, Fax: (518) 274-0210

ROSS VALVE Mfg. Co., Inc.

6 OAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274 0961

GLOBE VALVE & PISTON ASSEMBLY
WITH FLAT SEAT & PLAIN PACKING SUPPORT

Piston Assembly



| PART | DESCRIPTION | QUANTITY |
|------|---------------------------------|----------|
| 1 | SHELL | 1 |
| 2 | TOP CAP | 1 |
| 3 | BOTTOM STEM GUIDE NUT | 1 |
| 4 | PISTON CUP FOLLOWERS (SET OF 2) | 1 |
| *5 | PISTON CUP PACKING | 2 |
| 6 | BOTTOM STEM LOCK NUT | 2 |
| 7 | STEM NUT W/ SET SCREWS | 1 |
| 8 | SEAT DISC | 1 |
| *9 | SEAT PACKING | 1 |
| 10 | SEAT PACKING SUPPORT | 1 |
| 11 | STEM | 1 |
| 12 | MAIN CUP PLATES (SET OF 2) | 1 |
| *13 | MAIN CUP PACKING | 2 |
| 14 | MAIN BUSHING | 1 |
| 15 | UPPER STEM NUT W/ SET SCREWS | 1 |
| 16 | BOTTOM CAP | 1 |

| PART | DESCRIPTION | QUANTITY |
|------|-------------------------------------|----------|
| *20 | INDICATOR ROD | 1 |
| 21 | INDICATOR STUFFING BOX | 1 |
| 23 | BOTTOM CAP CYLINDER | 1 |
| 24 | SEAT RING | 1 |
| A | BOLT & NUT - TOP & BOTTOM CAP | VARY |
| B | BOLT, NUT & WASHER - SEAT RING | VARY |
| *C | PACKING - INDICATOR STUFFING BOX | 1 SET |
| *D | GASKET - TOP CAP & MAIN BUSHING | 2 |
| *E | GASKET - STEM | 3 |
| F | BOLT, NUT & WASHER - CUP PLATES | VARY |
| G | BOLT & WASHER - BOTTOM CAP CYLINDER | VARY |
| H | GASKET - BOTTOM CAP | 1 |
| J | BOLT, NUT & WASHER - SEAT DISC | VARY |
| K | GASKET - SEAT RING | 1 |
| L | GASKET - BOTTOM CAP CYLINDER | 1 |

* INDICATES WHICH ITEMS COME IN THE STANDARD VALVE REPAIR KIT.

ROSS VALVE SUPPORT SERVICES

PROVIDES PERSONAL SERVICE IN EVERY PHASE OF DEVELOPMENT, INSTALLATION AND MAINTENANCE.

We are always available to provide answers to any questions. No sale is ever "final"



DEDICATED SUPPORT LINES

Sales engineers available Monday through Friday 7am to 5:00pm EST

Phone to help with any questions — (518) 274-0961

Fax machine – (518) 274-0210

After Hours Support – (518) 279-4373

E-Mail – sales@rossvalve.com



TRAINING

Factory Training — Ross Valve believes that our customers should know as much as possible about our products. That is why we periodically host Customer Training seminars at our Ross Technology Park in Troy, NY. Here, our customers learn the workings of the valves, how to correctly maintain them, and how they are manufactured.

In addition, Ross representatives are often in the field giving product seminars for your convenience.

FIELD SERVICE

When a repair, upgrade, or modification is required for an existing Ross Valve, Factory Authorized Ross Service Technicians offer the best service available, including:

Technical assistance for start-up or continuing training.

Fully inventoried service vehicles to allow replacement of necessary parts.

Confined Space/OSHA trained with latest equipment

On-site / hands-on training for your staff.

Ability to return older valves to "like-new" condition.

YEARLY CONTRACTS AVAILABLE

WARRANTY

All valves and materials are guaranteed free from defects for 1 year from the date shipped.

Ross Valves are economically rebuilt. Every internal part is replaceable through the top of the valve, without removing it from the line. All seals and internal packings are replaceable, which contributes to the valve's longevity.

Ross Valve stocks a wide variety of repair parts which can be received by the customer as early as the next day. In-house computer links track packages to ensure timely delivery.

Detailed historical record keeping gives us a full report of all maintenance or upgrades that have been made on each valve. This allows us to evaluate performance in the past and maximize performance in the future.



ROSS
1879 VALVE
Automatic Control Valves & Pre-Packaged
Vaults for Water & Wastewater
www.rossvalve.com

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E-Mail: sales@rossvalve.com