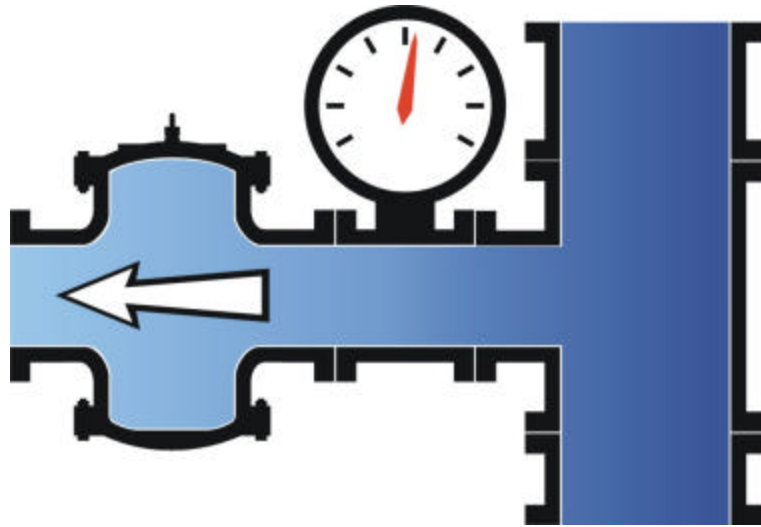


INSTRUCTION MANUAL

INSTALLATION – OPERATION – TROUBLESHOOTING – MAINTENANCE

PRESSURE RELIEF VALVE WITH SURGE ANTICIPATION (HYDRAULIC) FEATURE

MODEL 50RWR-A



Please reference the valve Serial Number whenever ordering parts or contacting the factory. The Serial Number is located on a metal tag pinned to the valve body or cap.

SERIAL NUMBER L _____



Ross Valve Mfg. Co., Inc.
6 Oakwood Ave, Troy, New York 12180
Tel 518.274.0961 - Fax 518.274.0210
www.rossvalve.com

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.

RELIEF VALVE

Purpose: Control pressure in main line

Model Number: 50RWR

Sizes: 4" - 48"

Type: Throttling

Primarily Controlled By:

Hydraulic pressure

Located: In tee connection

Purpose: To prevent excessive pressure in the main line

Inlet Pressure: Maximum: 300 psi

Inlet Pressure: Minimum: 5 psi

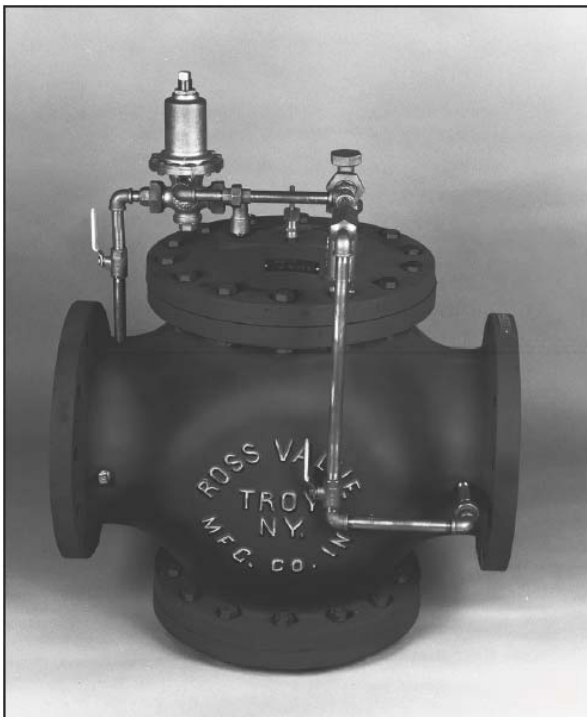
Construction: Body: 4" - 36" - Cast iron (semi-steel) with bronze trim
40" - 48" - Ductile iron, with bronze/stainless steel trim

Control Devices:

Strainer: Model 5F-2

Valves: Needle

Pilot: Relief/Back Pressure Sustaining:
Model 50RWR



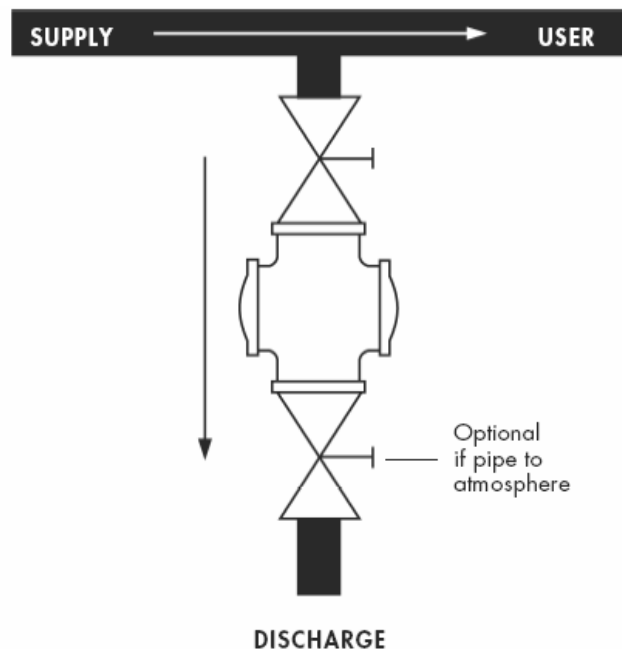
Options

1. Angle body design (90 degree)

Basic Application

Protect lines against excessive pressure that may be caused by:

1. Rapid or erroneous closing of a valve or hydrant.
2. Failure of a pressure reducing station.
3. Starting and stopping a pump equipped with a slow type check valve.
4. Reduced demand in a closed loop pumped system.
5. Power Failure.



If: Pressure in the supply/user line exceeds a preset acceptable pressure

Ross Main Valve will: Discharge a sufficient amount of water to reduce pressure to the preset level.

If: Pressure in the supply/user line drops to the preset pilot valve setting

Ross Main Valve will: Close.

RELIEF VALVE

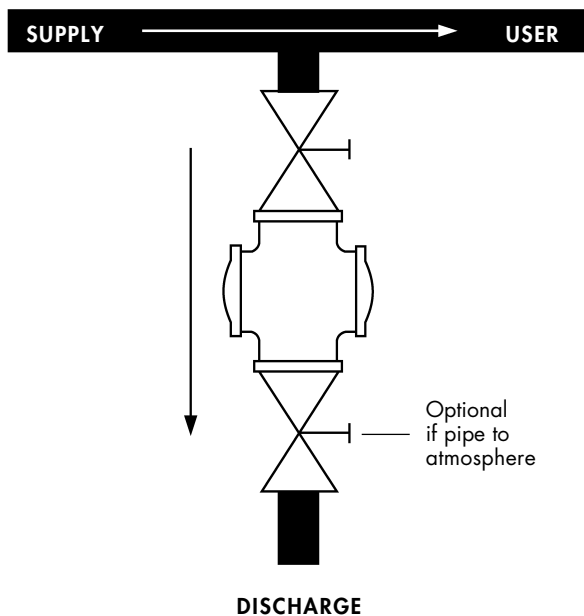
Basic Applications

Customized Features

Basic Applications

Protect lines against excessive pressure that may be caused by:

1. Rapid or erroneous closing of a valve or hydrant.
2. Failure of a pressure reducing station.
3. Starting and stopping a pump equipped with a slow type check valve.
4. Reduced demand in a closed loop pumped system.
5. Power Failure.



If: Pressure in the supply/user line exceeds a preset acceptable pressure

Ross Main Valve will: Discharge a sufficient amount of water to reduce pressure to the preset level.

If: Pressure in the supply/user line drops to the preset pilot valve setting

Ross Main Valve will: Close.

A - Surge Control

Primarily Controlled By: Hydraulic pressure (mainline)

Located: Along external piping of the relief valve

Purpose: To anticipate and minimize pressure waves

SYSTEM COMPONENTS:

Accumulator Drum: Sized according to need

Drain Orifice

Valves: *Ball:* Speed Control

Pilot: Low pressure "anticipating"

BASIC APPLICATION: Start relief valve open on a low pressure wave before the shock wave reaches the station.

CUSTOMIZED CONTROL UNIT: Added to the relief valve external piping circuit to provide additional control over pressure in the operating chamber are:

1. External piping that extends from the operating chamber to the accumulator drum.
2. Accumulator - Collects water from the operating chamber and lets it slowly "bleed" out.
3. Drain orifice - Causes water to slowly "bleed" out of the accumulator.
4. Ball valve - Limits flow from the operating chamber into the accumulator.

OPERATION: Because the surge control feature anticipates the surge, it automatically readies the valve in advance to react, thereby maintaining an acceptable pressure within the main line.

1. When line pressure falls, it activates the following cycle.
 - a. When pressure drops to the low pressure valve setting, the valve opens and causes water to flow from the operating chamber into the accumulator where it "bleeds" out at a much slower rate than the water entering.
 - b. Main line water, encountering decreased resistance, pushes the piston up, opening the main valve.
 - c. Main valve remains open until the accumulator fills up and no more water can be transferred. (The accumulator is sized to insure the valve remains open until the high pressure wave has been relieved through the open valve.)
2. When line pressure exceeds the relief valve setting,
 - a. The relief valve pilot overrides all other functions, causing the main valve to act like a standard relief valve.
3. When main line pressure has returned to "normal",
 - a. Water remaining in the accumulator continues to discharge into the atmosphere until the accumulator is empty.
 - b. The main valve acts like a basic relief valve.

CAUTION: It is important not to oversize valves because they usually go wide open.



P.O. BOX 595, TROY, NEW YORK 12181
TEL 518 274 0961 - FAX 518 274 0210
WWW.ROSSVALVE.COM

IMPORTANT

To ensure proper operation of this relief valve, the controls of the valve must always be supplied with a positive pressure source. This positive pressure source is particularly important for installations where the relief or surge control valve is discharging to atmosphere or near atmospheric pressures.

Low pressure conditions typically associated with a relief valve occur when the valve opens during start-up, test, or during a high pressure surge. Adequate testing should be performed on this valve and system to assure a low pressure condition will not occur during a surge condition.

The system should be tested with the relief valve open. Supply pressure to the control piping should not fall below approximately **20 psi**. With the valve open and discharging water, the valve should be able to close automatically as water is reintroduced into the controls. If the valve does not close, the controls should be piped to a positive pressure source.

If a low pressure condition exists, the contractor or user should run a separate source of water pressure to the controls of the valve. A separate pressure source can typically be obtained from a header or similar location in the system where the line pressure is stable throughout the operation of the relief valve.

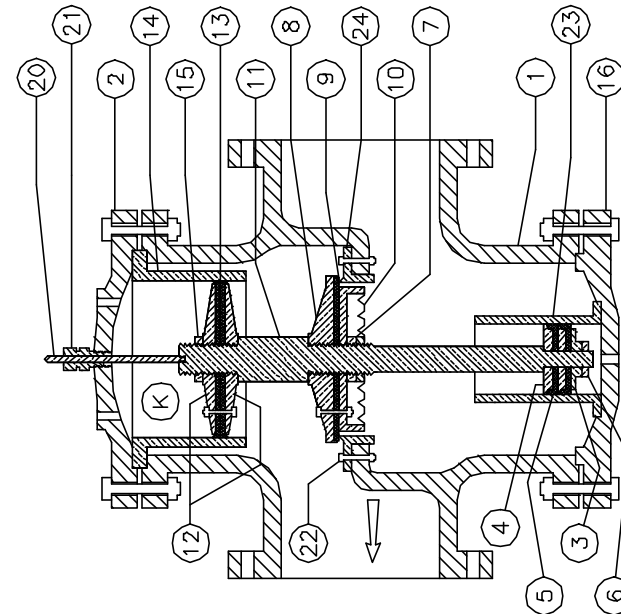
ROSS VALVE MFG. CO., INC.



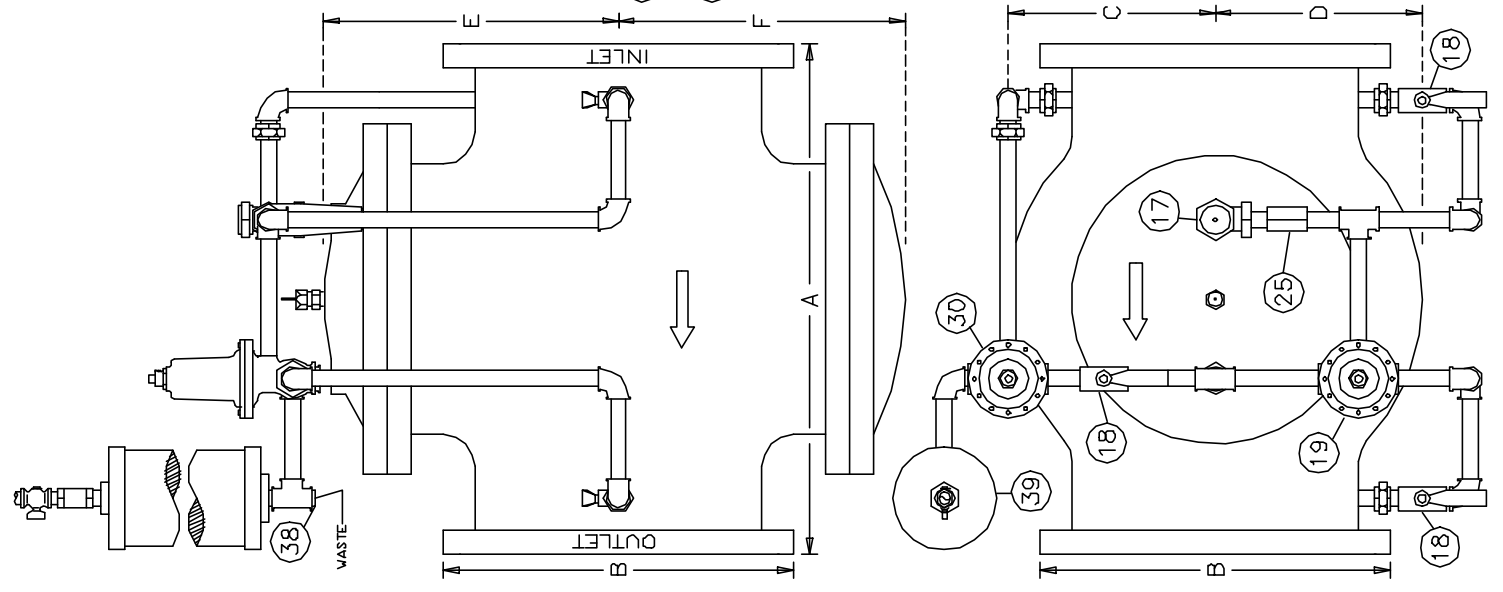
PART	DESCRIPTION	QTY.	MATERIAL
1	VALVE SHELL	1	CAST IRON
2	TOP CAP	1	CAST IRON
3	BOTTOM STEM GUIDE NUT	1	BRONZE
4	BOTTOM CUP FOLLOWERS (SET OF 2)	2	BRONZE
5	PISTON CUP PACKING	2	LEATHER
6	BOTTOM STEM LOCK NUT	1	BRONZE
7	STEM NUT	1	BRONZE
8	SEAT DISC	1	BRONZE
9	SEAT PACKING	1	POLYURETHANE
10	SEAT PACKING SUPPORT	1	BRONZE
11	STEM	1	BRONZE
12	MAIN CUP PLATES (SET OF 2)	2	BRONZE
13	MAIN CUP PACKING	2	LEATHER
14	MAIN BUSHING	1	BRONZE
15	TOP STEM NUT	1	BRONZE
16	BOTTOM CAP	1	CAST IRON
17	NEEDLE VALVE	1	BRONZE
18	ISOLATION VALVE	3	BRONZE
19	PILOT VALVE - HIGH PRESSURE	1	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
30	PILOT VALVE - LOW PRESSURE	1	BRONZE
38	ORIFICE	1	BRONZE
39	CONTROL TANK	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 50RWR-A DATE 5/15/00 RJC
 GLOBE BODY 4" - 36" NO SCALE FIGURE 37A
 Model 50RWR-A
 SURGE CONTROL VALVE
 WITH HYDRAULIC ACTUATION



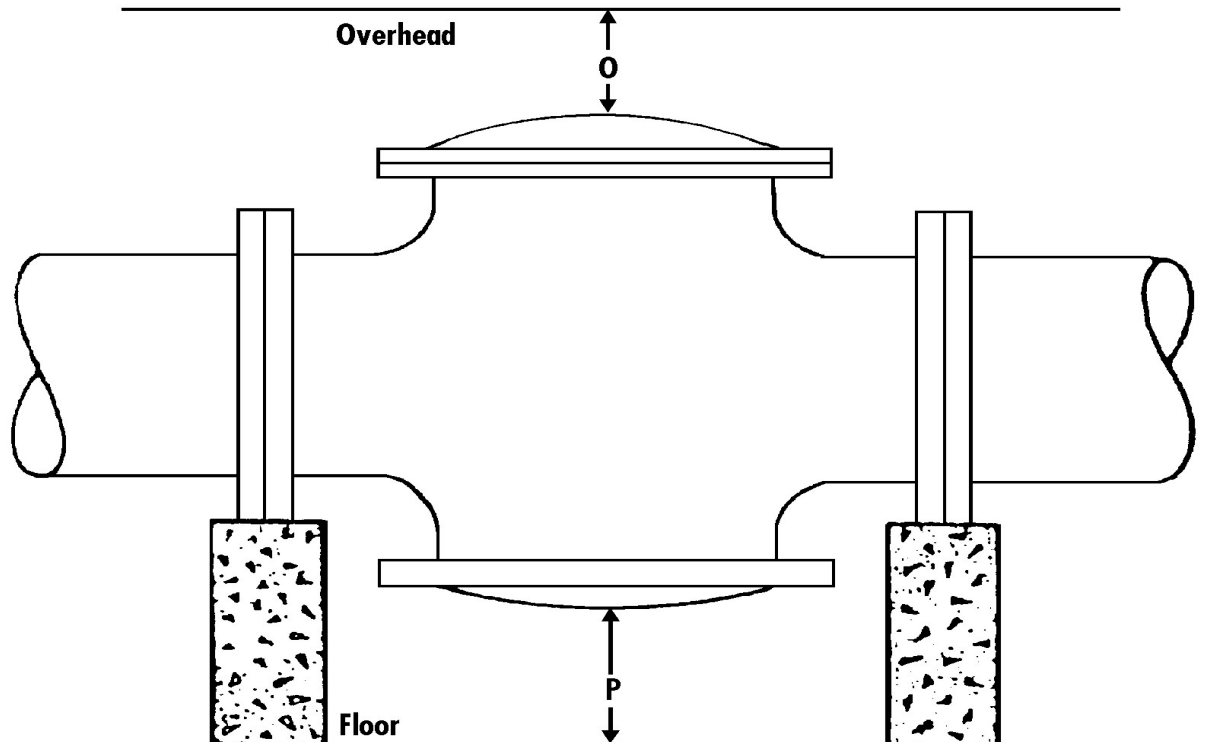
VALVE SIZE (IN)	ANSI B.16.1 CLASS	SHIPPING WEIGHT (LBS)	DIMENSIONS (INCHES)			E&F
			A	B	C&D	
4	125	235	14	9	4-3/4	7
	250	275	14-5/8	10	4-3/4	7
6	125	375	17-3/4	11	6-5/8	9
	250	430	17-3/4	12-1/2	6-5/8	9
8	125	690	24	13-1/2	8-3/4	12-1/2
	250	750	24-13/16	15	8-3/4	12-1/2
10	125	920	24-7/8	16	10	14-1/4
	250	1000	26-1/4	17-1/2	10	14-1/4
12	125	1375	30	19	12	15-1/2
	250	1475	31-1/2	20-1/2	12	15-1/2
14	125	1770	34-1/4	21	14	18
	250	1850	35-3/4	23	14	18
16	125	2400	37-7/8	23-1/2	15	21-1/2
	250	2600	39-1/4	25-1/2	15	21-1/2
18	125	3300	41-7/8	25	18-3/8	24
	250	3500	41-7/8	28	18-3/8	24
20	125	3550	42-3/8	27-1/2	18-3/8	24
	250	3800	42-3/8	30-1/2	18-3/8	24
24	125	5200	47	32	20	25
	250	5500	47	36	20	25
30	125	13000	63-3/4	38-3/4	26-1/4	34
	250	13500	65-1/16	43	26-1/4	34
36	125	16000	65	46	26-1/4	34
	250	18700	65	50	26-1/4	34



DIMENSIONS

Globe Body Minimum Clearances

Piston Valve Sizes: 4" - 48"



Size (Inches)	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"	48"
O	14	16	18	21	23	28	28	33	33	36	43	46	54	60
P	4 1/2	5 1/2	6 1/2	1	1	1	1	1	1	1	1	1	1	1

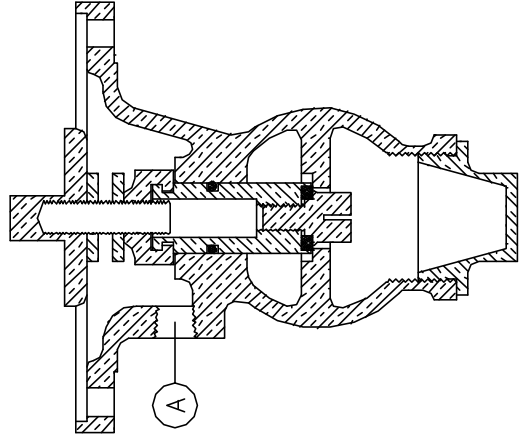
Note

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.

VIEW FROM PILOT INLET



A - STATIC SENSING CONNECTION UNDER DIAPHRAGM TO REMOTE INLET PRESSURE SOURCE

PART	DESCRIPTION	QTY.	MATERIAL
2	ADJUSTING SCREW	1	BRONZE
3	LOCK NUT	1	BRONZE
4	SPRING CHAMBER	1	BRONZE
5	TOP SPRING WASHER	1	BRONZE
6	SPRING(S)	VARY	STEEL
7	BOTTOM SPRING WASHER	1	BRONZE
8	DIAPHRAGM BUTTON	1	BRONZE
*9	DIAPHRAGM(S)	VARY	BRONZE
10	DIAPHRAGM COVER	1	BRONZE
11	BOLT & NUT - DIAPHRAGM COVER	VARY	BRONZE
12	PILOT STEM	1	BRONZE
*13	O-RING - PILOT STEM	1	BUNA-N
14	DIAPHRAGM STEM	1	STAINLESS
15	SHELL	1	BRONZE
16	BOTTOM CAP	1	BRONZE
17	LOCK NUTS - DIAPHRAGM STEM	2	BRONZE
18	LINK NUT	1	BRONZE
*19	SEAT PACKING	1	POLYURETHANE
20	SEAT FOLLOWER & WASHER	1	BRONZE
*22	GASKET - BOTTOM CAP	1	COMPOSITION
*23	GASKET - DIAPHRAGM	1	COMPOSITION

*INCLUDED IN STANDARD REPAIR KIT

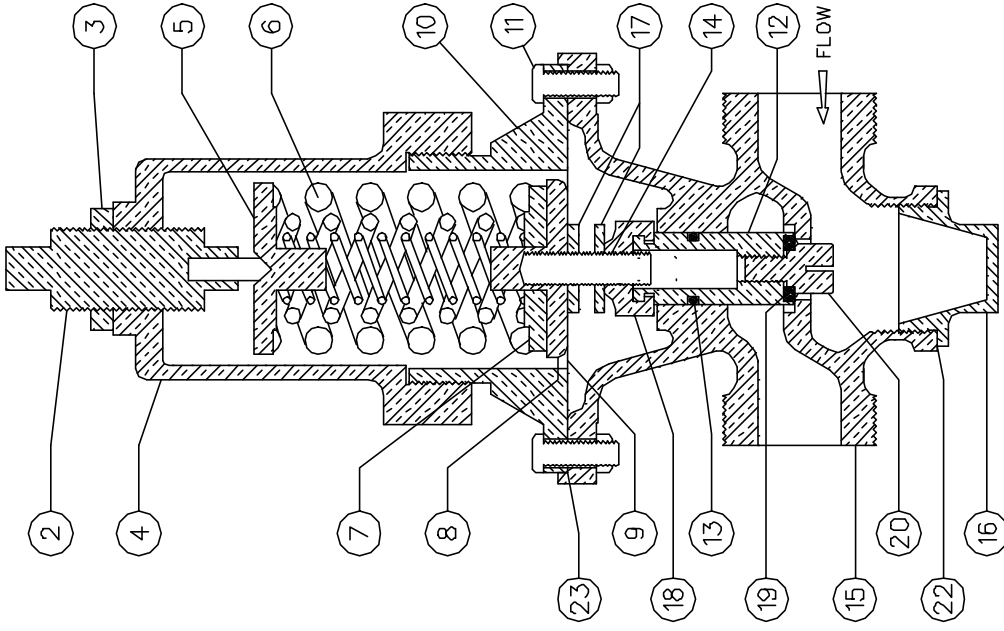
The purpose of a pilot valve is to control the opening and closing of the main valve by trapping or releasing water from the main valve's "operating chamber" ("K" - the chamber above the main valve piston). The **Model 50RWR Relief or Back Pressure Sustaining Pilot Valve** uses this logic in order to control pressure upstream of the main valve.

The pilot valve operates by creating a pressure balance across the diaphragms (#9). Pressure above the diaphragms is set by the adjusting screw (#2) acting on the springs (#6). Pressure beneath the diaphragms is exerted hydraulically via a separate sensing port directly under the diaphragms, from a remote inlet pressure source.

When the pilot valve senses a low inlet pressure, the force of the springs (#6) causes the diaphragms (#9) and entire stem assembly to move down. This pushes the pilot seat packing (#19) into the seat, trapping water in the main valve operating chamber. This causes the piston of the main valve to close, resulting in an increase in the upstream pressure.

Once the upstream pressure rises above the setting of the springs (#6), the hydraulic force overcomes the spring force and the stem assembly is pulled upwards by the attached diaphragms (#9). This causes the pilot seat packing (#19) to come off its seat, releasing water from the main valve operating chamber. This causes the piston of the main valve to open, resulting in a decrease in the inlet pressure.

This opening and closing sequence (commonly referred to as "throttling") is continuously taking place in order to control the inlet pressure of the main valve.



FILE: P50RWR	
ROSS VALVE Mfg. Co., Inc.	
6 OAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274-0961	
NO SCALE	DRAWING 50RWR PILOT
DATE 10-1-81	REVISED 6-30-99 S.M
MODEL 50RWR PILOT VALVE RELIEF OR BACK PRESSURE SUSTAINING	

PART	DESCRIPTION	QTY.	MATERIAL
3	REGULATING SCREW	1	BRONZE
4	LOCK NUT	1	BRONZE
5	SPRING CHAMBER	1	BRONZE
6	TOP SPRING WASHER	1	BRONZE
7	SPRING(S)	VARY	STEEL
8	BOTTOM SPRING WASH (OPT.)	1	BRONZE
9	DIAPHRAGM BUTTON	1	BRONZE
10	DIAPHRAGM(S)	VARY	BRONZE *
11	BOLTS & NUTS - CHAMBER	VARY	BRONZE
12	DIAPHRAGM NUT	1	BRONZE
13	STEM NUT	1	BRONZE
14	O-RING - THIMBLE	1	BUNA-N *
15	THIMBLE	1	BRONZE
16	SEAT PACKING	1	POLYURETHANE *
17	VALVE SHELL	1	BRONZE
18	VALVE STEM	1	BRONZE
19	LINK NUT	1	BRONZE
20	LOCK NUT	1	BRONZE
21	BOTTOM CAP	1	BRONZE
22	STEM - DIAPHRAGM	1	STAINLESS STEEL
23	GASKET - BOTTOM CAP	1	COMPOSITION *
24	GASKET - DIAPHRAGM	1	COMPOSITION *
25	O-RING - LOCKNUT	1	BUNA-N

* - THESE PARTS ARE SUPPLIED IN A STANDARD REPAIR KIT

The purpose of a pilot valve is to control the opening and closing of the main valve by trapping or releasing water from the main valve's "operating chamber" ("K" - the chamber above the main valve piston). The **Model 40WR Pressure Reducing Pilot Valve** uses this logic in order to maintain a constant pressure downstream of the main valve.

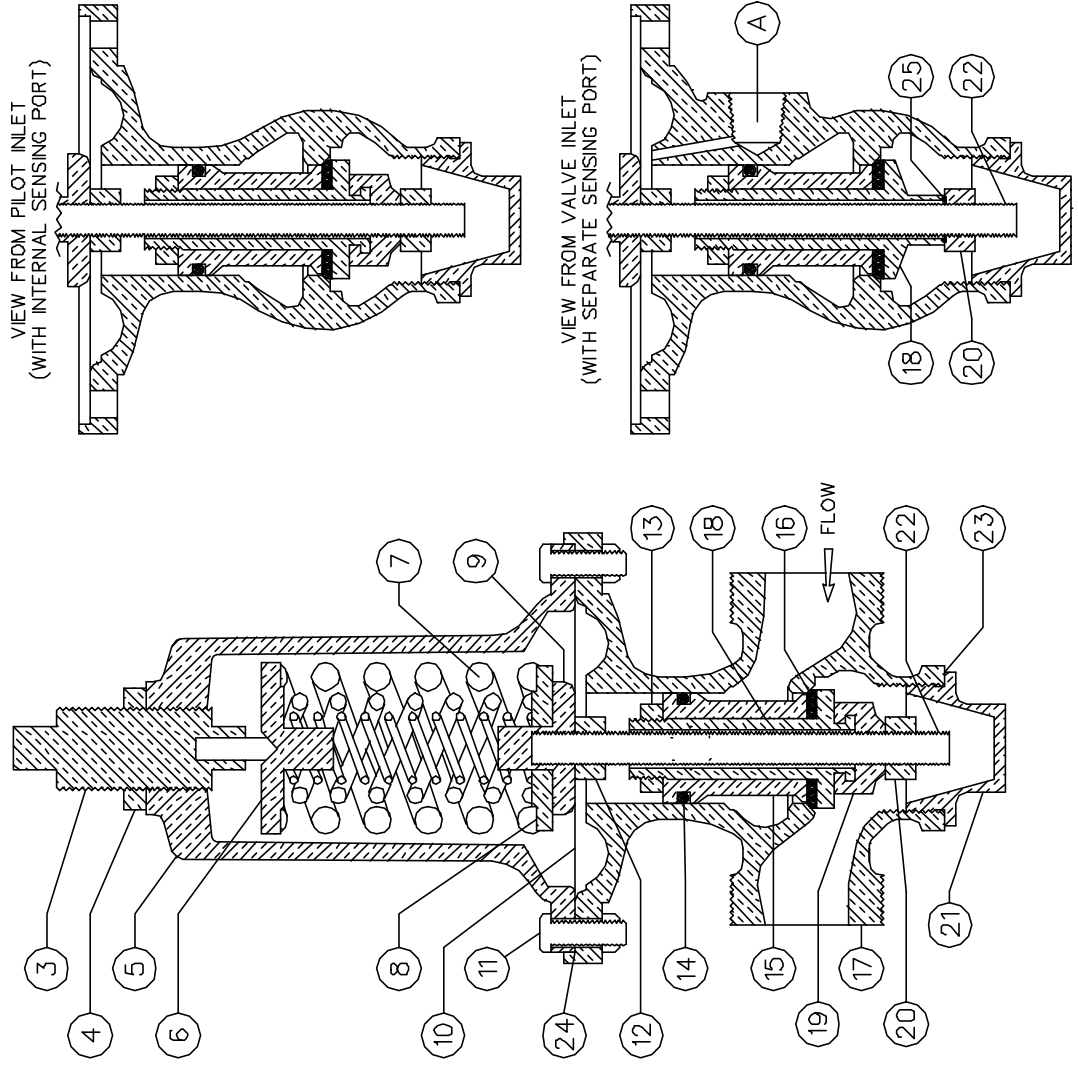
The pilot valve operates by creating a pressure balance across the diaphragms (#10). Pressure above the diaphragms is set by the regulating screw (#3) acting on the adjusting springs (#7). Pressure beneath the diaphragms is exerted hydraulically in one of two manners:

- 1 - A sensing port through the stem (#18) to the outlet throat of the pilot valve, or
- 2 - A separate sensing port directly under the diaphragms, from a remote outlet pressure source.

When the pilot valve senses a low outlet pressure, the force of the springs (#7) causes the entire stem assembly to move down. This pushes the seat packing (#16) away from the seat, allowing water to escape in the downstream pressure. This causes the piston of the main valve to open, resulting in an increase in the downstream pressure.

Once the downstream pressure rises above the setting of the springs (#7), the hydraulic force overcomes the spring force and the stem assembly is pushed upwards. This causes the pilot seat to seal off, trapping water in the main valve operating chamber (with water still entering through the inlet line). This causes the piston of the main valve to close, resulting in a decrease in the outlet pressure.

This opening and closing sequence (commonly referred to as "throttling") is continuously taking place in order to maintain a constant outlet pressure.



A - STATIC SENSING CONNECTION UNDER DIAPHRAGM TO REMOTE OUTLET PRESSURE SOURCE

ROSS VALVE Mfg. Co., Inc.	
6 DAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274-0961	
NO SCALE	DRAWING 40WR PILOT
DATE 4-2-63 2B51/2	REVISED 9-24-99 S.M.
MODEL 40WR PILOT VALVE PRESSURE REDUCING	

FILE: P40WR

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

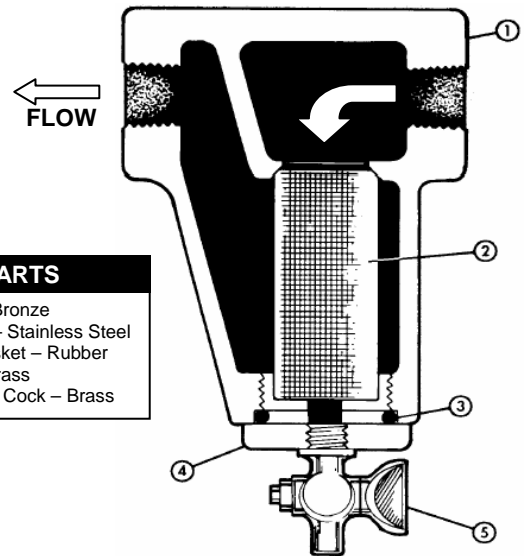
1. Strainer should be "blown down" frequently to remove collected foreign material from the sediment chamber.
2. Strainer screen should be removed occasionally for inspection and thorough cleaning.

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:

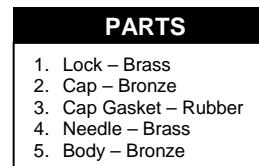
1. Remove the hex cap (#2) and lock (#1).
2. With a screw driver;
 - a. Turn the needle (#4) counter-clockwise to raise it
 - b. Turn the needle (#4) clockwise to lower it
3. Once the optimum position is determined, no further adjustment of the needle should be required.

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.

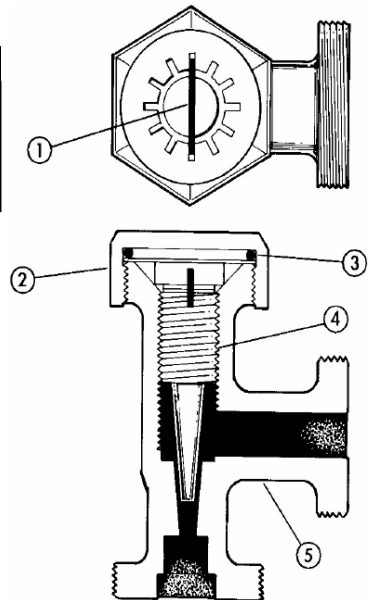
Option

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



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 _____

TROUBLESHOOTING - Globe Body Valves

The following troubleshooting procedure is designed to isolate the main valve from its controls, in order to determine the cause of malfunction. By controlling the pressure of the operating chamber, one can simulate pilot control and determine if the main valve is operational, despite the response of the pilot.

CAUTION: Before manually opening or closing the valve substantially, the effects on the inlet and outlet system pressures must be considered. To test valve response, it is usually sufficient to momentarily perform the following manual tests:

To manually close the main valve...

- @ Pressurize the operating chamber by slowly closing the isolation valve in series with the pilot valve.
- @ Water from the inlet side of the main valve should still enter the operating chamber through the strainer and needle valve, causing the operating chamber to fill.
- @ This should force the piston down, causing the valve to close.

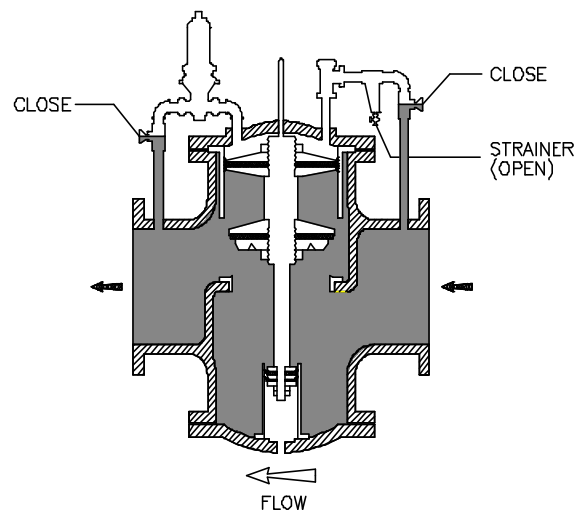
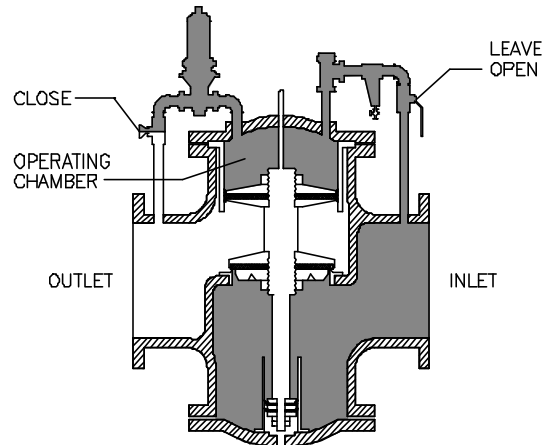
If the main valve fails to close and continues to pass water, it may indicate the following:

- @ Worn packings - Part Numbers 5 (piston cup packings), 9 (seat packing), and 13 (main cup packings).
- @ Fouled or incorrectly set needle valve - Needle should be free of debris and adjusted between 3/4 to 1-1/2 turns from full closed position.
- @ Plugged Strainer Screen - Screen should be free of debris.
- @ Mechanical blockage within valve body.

To manually open the main valve...

- @ De-pressurize the operating chamber by slowly closing both isolation valves in the control piping, then opening the strainer flush cock.
- @ This should prevent any additional water from entering the operating chamber, and allow it to drain.
- @ The force of the inlet pressure should force the piston up, causing the valve to open.

If the main valve fails to open, it may indicate worn main cup packings (part number 13).



G-Tshoot.dwg

If the main valve does not respond to manual operation, it usually indicates that the packings need to be replaced. Typically, the condition of the packings can be accurately gauged by observing the leakage through the vent hole in the bottom cap of the main valve. Negligible leakage usually indicates that the packings are serviceable.

If the main valve does respond consistently to manual operation with a steady stroke of the piston, it may indicate the external controls need adjustment or repair.

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.

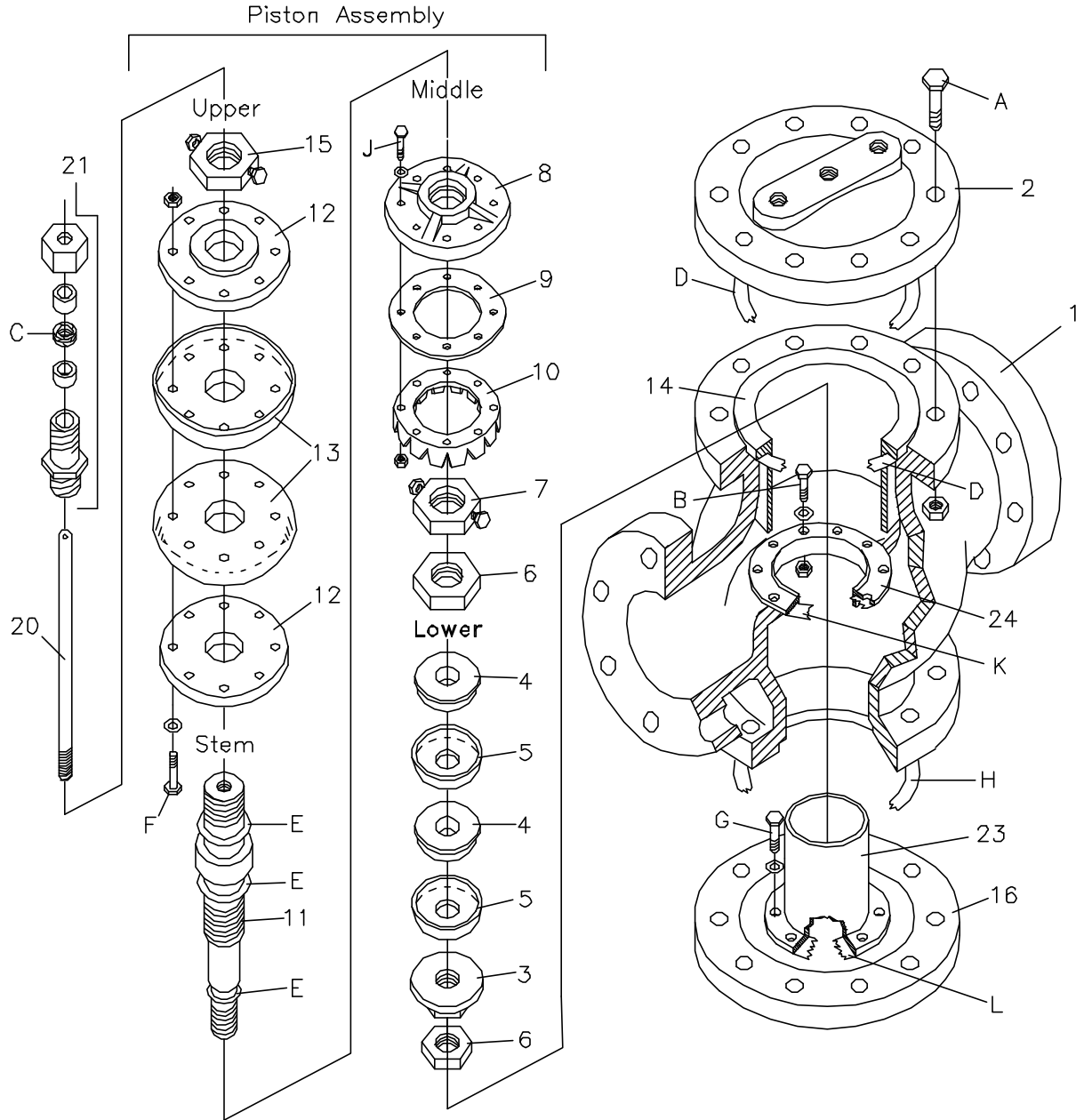
All replaceable packings and gaskets are stock items and may be ordered as a repair kit for valve serial number _____. They are available for regular UPS delivery or next day service.

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

STANDARD VALVE ASSEMBLY - FLAT SAWTOOTH STYLE SEAT
PISTON STYLE GLOBE BODY (4"-36")



PART	DESCRIPTION	QUANTITY	MATERIAL	PART	DESCRIPTION	QUANTITY	MATERIAL
1	VALVE SHELL	1	CAST IRON	*20	INDICATOR ROD	1	BRONZE
2	TOP CAP	1	CAST IRON	21	INDICATOR STUFFING BOX	1	BRONZE
3	BOTTOM STEM GUIDE NUT	1	BRONZE	23	BOTTOM CAP CYLINDER	1	BRONZE
4	BOTTOM CUP FOLLOWERS	2 SET	BRONZE	24	SEAT RING	1	BRONZE
*5	PISTON CUP PACKING	2	LEATHER	A	BOLT & NUT - TOP & BOTTOM CAP	VARY	STEEL
6	BOTTOM STEM LOCK NUT	1	BRONZE	*B	BOLT, NUT & WASHER - SEAT RING	VARY	BRONZE
7	STEM NUT	1	BRONZE	*C	PACKING - INDICATOR STUFFING BOX	1 SET	TEFLON
8	SEAT DISC	1	BRONZE	*D	GASKET - TOP CAP & MAIN BUSHING	2	COMPOSITION
*9	SEAT PACKING	1	POLYURETHANE	E	GASKET - STEM	3	COMPOSITION
10	SEAT PACKING SUPPORT	1	BRONZE	F	BOLT, NUT & WASHER - CUP PLATES	VARY	BRONZE
11	STEM	1	BRONZE	G	BOLT & WASHER - BOTTOM CAP CYLINDER	VARY	BRONZE
12	MAIN CUP PLATES	2 SET	BRONZE/CAST IRON	H	GASKET - BOTTOM CAP	1	COMPOSITION
*13	MAIN CUP PACKING	2	LEATHER	J	BOLT, NUT & WASHER - SEAT DISC	VARY	BRONZE
14	MAIN BUSHING	1	BRONZE	K	GASKET - SEAT RING	1	COMPOSITION
15	TOP STEM NUT	1	BRONZE	L	GASKET - BOTTOM CAP CYLINDER	1	COMPOSITION
16	BOTTOM CAP	1	CAST IRON				

* INDICATES WHICH ITEMS ARE INCLUDED IN THE STANDARD VALVE REPAIR KIT.