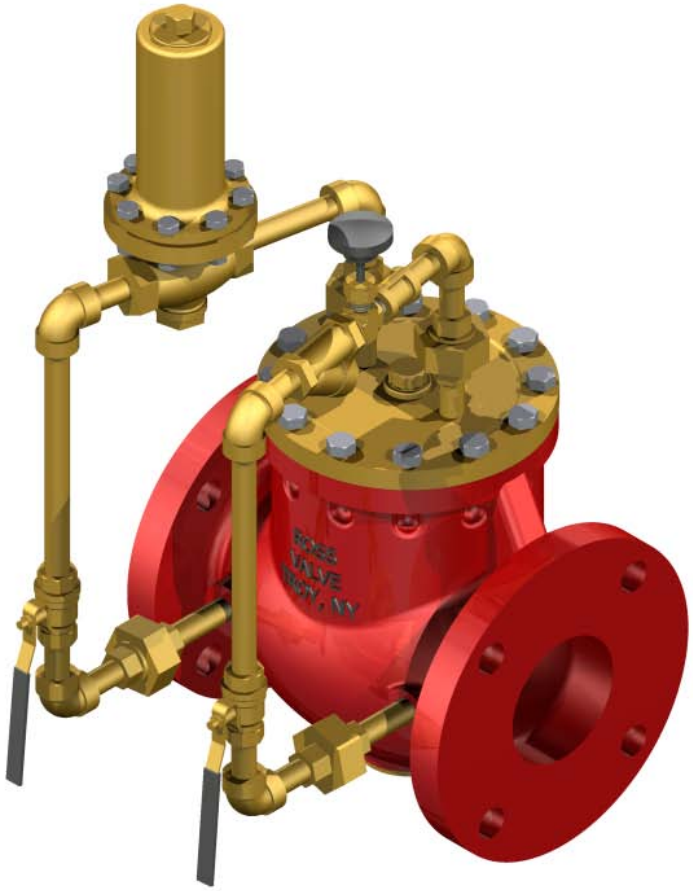
PRESSURE REDUCING VALVE

INSTRUCTIONS

Installation - Operation - Inspection - Maintenance



ROSS MODEL - 23WR
Pressure Reducing Valve

ROSS VALVE Mfg. Co., Inc.

PO BOX 595, TROY, NY 12181 - PHONE 518/274-0961 - FAX 518/274-0210

ROSS MODEL 23WR – PILOT OPERATED PRESSURE REDUCING VALVE

INSTRUCTIONS

SHIPMENT:

When received, the valve, depending upon size, may have external controls attached, or as a two piece shipment with main valve body on skids and external controls in a separate box. The inlet of main valve is identified with a metal tag. When controls are shipped separately, connections are tagged.

STORAGE:

If 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.

MAIN VALVE INSTALLATION:

1. Check inside of the valve for shipping blocks or other foreign material.
2. Flush main before installing, if possible, and close 1/4" and 1/2" isolation valve in external control for the first passage of water through the main valve.
3. Place valve in line with flange marked “Inlet” facing high pressure or supply line.
4. If external piping and controls are not attached to valve when shipped, connect couplings identified with tags which are numbered. Pet cocks are provided for attaching gauges to back side of valve. Optional Indicator Rod (#20) shows position of main stem.

Caution: Allow enough clearance above valve for stem assembly removal.

STARTING OPERATION:

1. Close 1/4" or 1/2" isolation valve in control piping.
2. Open the main line isolation valve on the discharge side of the valve (downstream).
3. Slowly open main line isolation valve on the high pressure of inlet side to the valve.
4. Open 1/4" or 1/2" isolation valve in control piping.

Loosening the union of the control piping on the top cap side of the Needle (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 with a wrench handle or block of wood until the valve operating chamber is pressurized.

PRESSURE REDUCING VALVE

Purpose: Control outlet pressure **Model Number: 23WR**

Sizes: $1^1/_2$" - 3"
Type: Throttling
Primarily Controlled By:
Hydraulic pressure
Located: In line
Purpose: To prevent pressure out of the main valve from exceeding a preset maximum level.
Ends: Female NPT or flanged
Inlet Pressure: Maximum: 300 psi
Inlet Pressure: Minimum: 20 psi
Class: 125 **ANSI** for inlet pressures to 180 psi
250 **ANSI** for inlet pressures to 300 psi
Discharge pressure: 5 psi - 250 psi
Fluid: Cold water service
Construction: Cast iron body/bronze cover, pilot, piston and internal trim
Control Valves:
Orifice
Pilot: Pressure Reducing: Model 23WR
See overall parts lists and specific parts information for complete details.

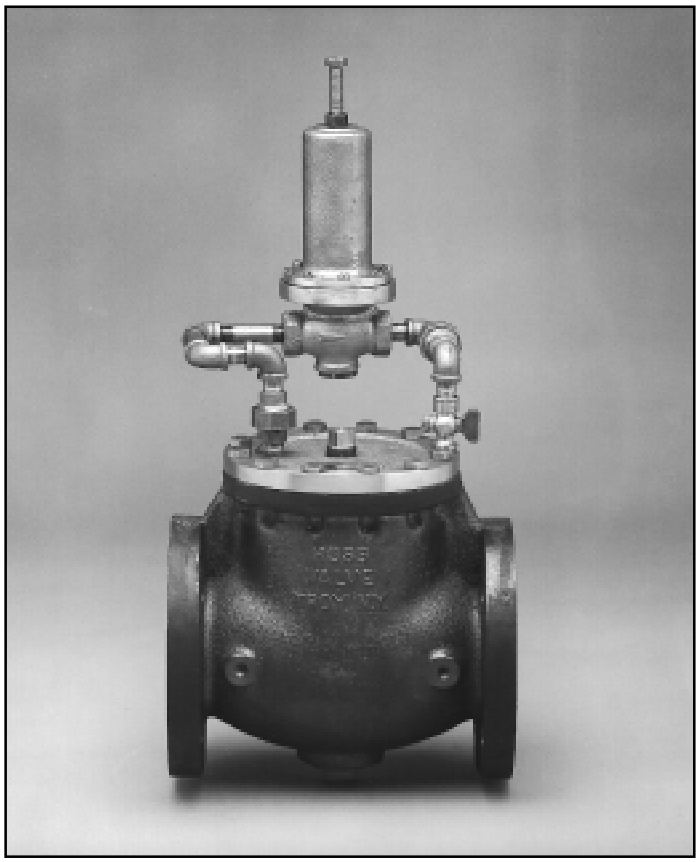
Options

1. All bronze body
2. Stainless steel trim
3. Indicator Rod

Customized Features

Any one or a selection of features can be added to the basic pressure reducing valve.

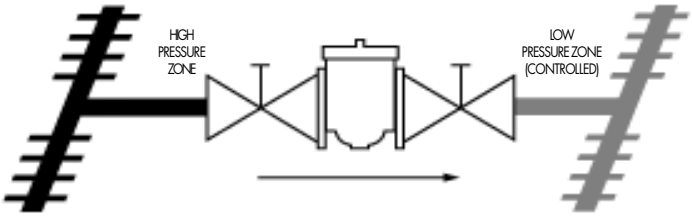
Code



Ross engineers customize the basic **23WR** to accommodate individual needs.

Basic Applications

1. Utilize water reserves in adjacent systems under emergency conditions.
2. Control large quantities of water while holding close limits on downstream pressure.



If: Supply pressure is higher than user capacity
Ross Main Valve will: Throttle to pass only enough water to the user to maintain a preset lower pressure.

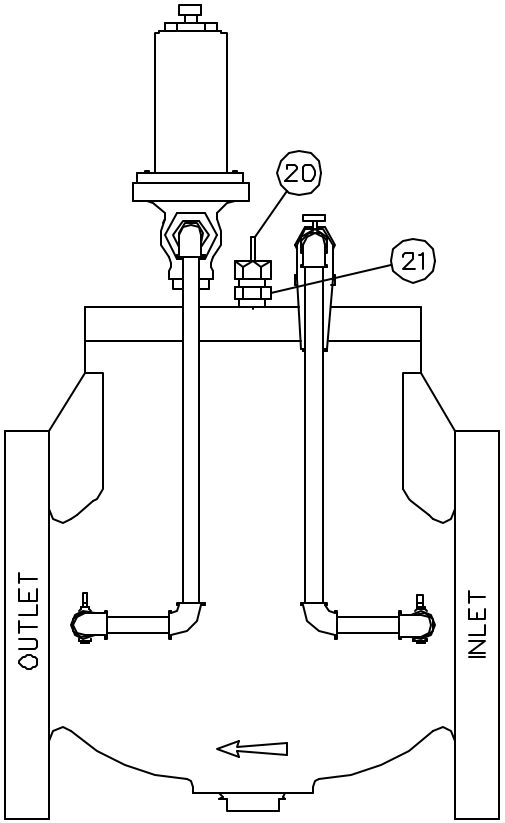
ROSS MODEL 23WR – PILOT OPERATED PRESSURE REDUCING VALVE

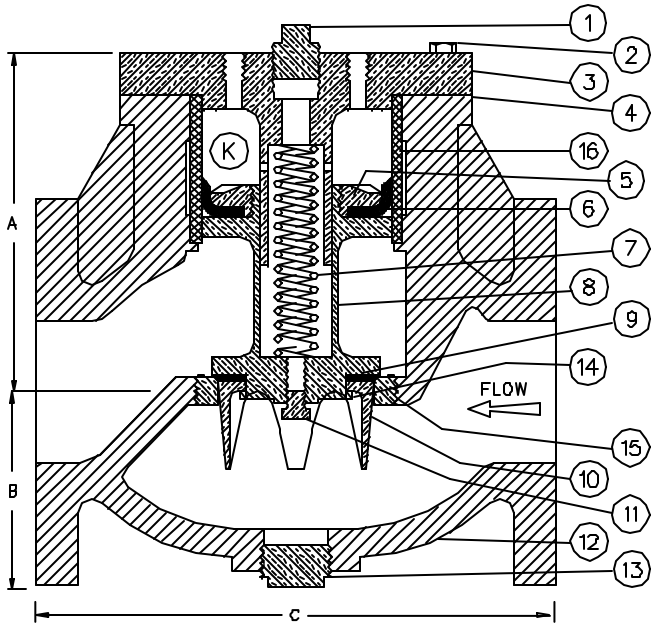
DESIGN:

This valve is designed to maintain a constant downstream pressure, regardless of changes in flow rate or upstream pressure. It is a pilot operated valve, capable of handling a wide range of flows without causing water hammer. The pilot valve is externally located for convenience and ease of adjustment. There is a shut-off cock located in the pilot line to override the pilot and close the main valve. Adjustment of the downstream pressure is made by turning the adjusting screw on top of the pilot valve (turn down, or *clockwise* to increase the downstream pressure).

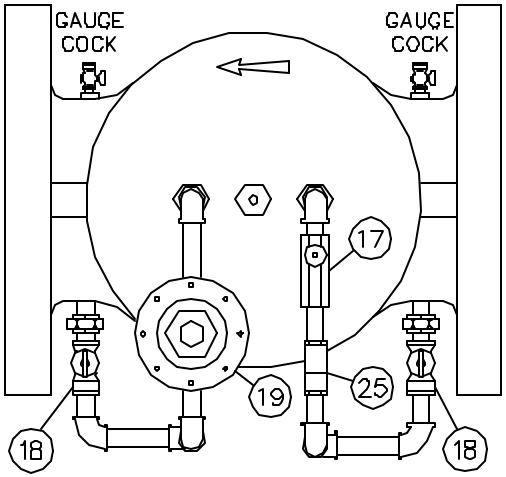
OPERATION:

High pressure water from upstream is introduced into the operating chamber above the main piston through some external piping, a strainer, and a needle valve. If the shut-off cock is closed, or if the pilot seat is closed, this pressure will be trapped and the valve will close. When the downstream pressure falls below the pilot setting, the drop in pressure is sensed under the pilot diaphragm, and the adjusting spring opens the pilot seat. This releases the pressure above the main piston and allows the valve to open and satisfy the demand. In actual operation, a balance between inflow to the power chamber, and outflow through the pilot is created. This changing balance closely follows small demand variations and repositions the piston to deliver a constant reduced pressure.





PART	DESCRIPTION	QTY.	MATERIAL
1	PLUG	1	BRONZE
2	BOLTS – COVER	VARY	BRONZE
3	COVER	1	BRONZE
4	GASKET – COVER	1	COMPOSITION
5	CUP FOLLOWER	1	BRONZE
6	CUP PACKING	1	LEATHER
7	GUIDE SPRING	1	STAINLESS STEEL
8	STEM	1	BRONZE
9	SEAT PACKING	1	POLYURETHANE
10	SEAT DISC	1	BRONZE
11	STEM PLUG	1	BRONZE
12	SHELL	1	CAST IRON
13	DRAIN PLUG	1	BRONZE
14	DISC NUT	1	BRONZE
15	SEAT RING	1	BRONZE
16	CYLINDER LINER	1	COMPOSITE
17	NEEDLE VALVE / ORIFICE	1	BRONZE
18	ISOLATION VALVE	2	BRONZE
19	PILOT VALVE – PRESSURE REDUCING	1	BRONZE
20	INDICATOR ROD	1	BRONZE
21	INDICATOR STUFFING BOX	1	BRONZE
25	STRAINER	1	BRONZE/STAINLESS

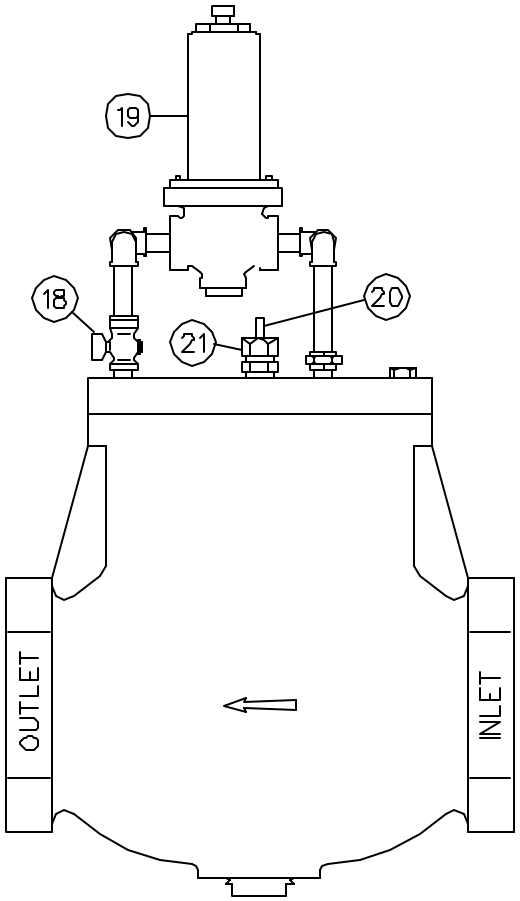


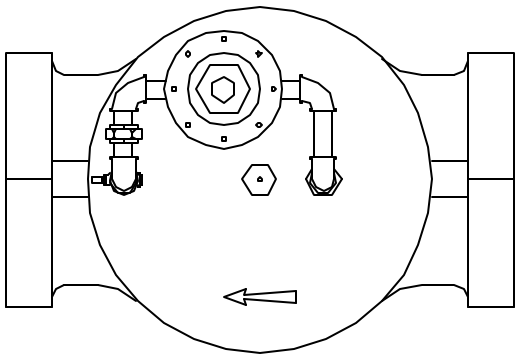
SIZE (INCHES)	ANSI CLASS	SHIPPING WEIGHT (LBS)	DIMENSIONS (INCHES)		
			A	B	C
1-1/2	125	35	4	3-1/4	7-5/8
	250	42	4	3-1/4	8-1/8
	NPT	30	4	3-1/4	8-3/8
2	125	55	5-1/2	3-1/2	8
	250	65	5-1/2	3-1/2	8-3/8
	NPT	50	5-1/2	3-1/2	8
2-1/2	125	75	6-1/2	4-1/2	9-1/4
	250	85	6-1/2	4-1/2	9-7/8
	NPT	70	6-1/2	4-1/2	9-1/4
3	125	80	6-1/2	4-1/2	9-1/4
	250	90	6-1/2	4-1/2	9-7/8
	NPT	75	6-1/2	4-1/2	9-1/4

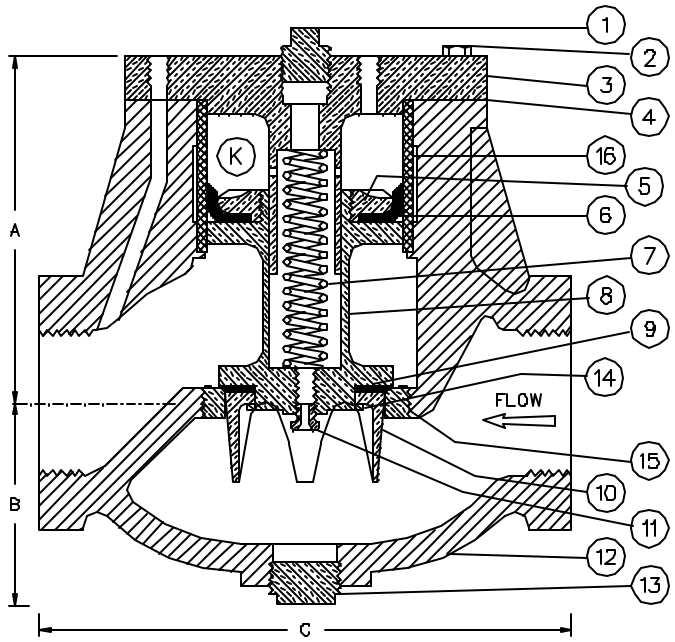
ROSS VALVE Mfg. Co., Inc.
6 OAKWOOD AVENUE - TROY, NEW YORK, 12180 - TEL. (518) 274 0961
POST OFFICE BOX 595 - TROY, NEW YORK, 12181 - FAX (518) 274 0210
WEBSITE: www.rossvalve.com - E-MAIL: sales@rossvalve.com

DRAWING	23WR	DATE	6-15-01 RJC
GLOBE BODY 1 1/2" – 3"	NO SCALE	FIGURE	1E

Model 23WR
PRESSURE REDUCING VALVE







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2-1/2	125	75	6-1/2	4-1/2	9-1/4
	250	85	6-1/2	4-1/2	9-7/8
	NPT	70	6-1/2	4-1/2	9-1/4
3	125	80	6-1/2	4-1/2	9-1/4
	250	90	6-1/2	4-1/2	9-7/8
	NPT	75	6-1/2	4-1/2	9-1/4

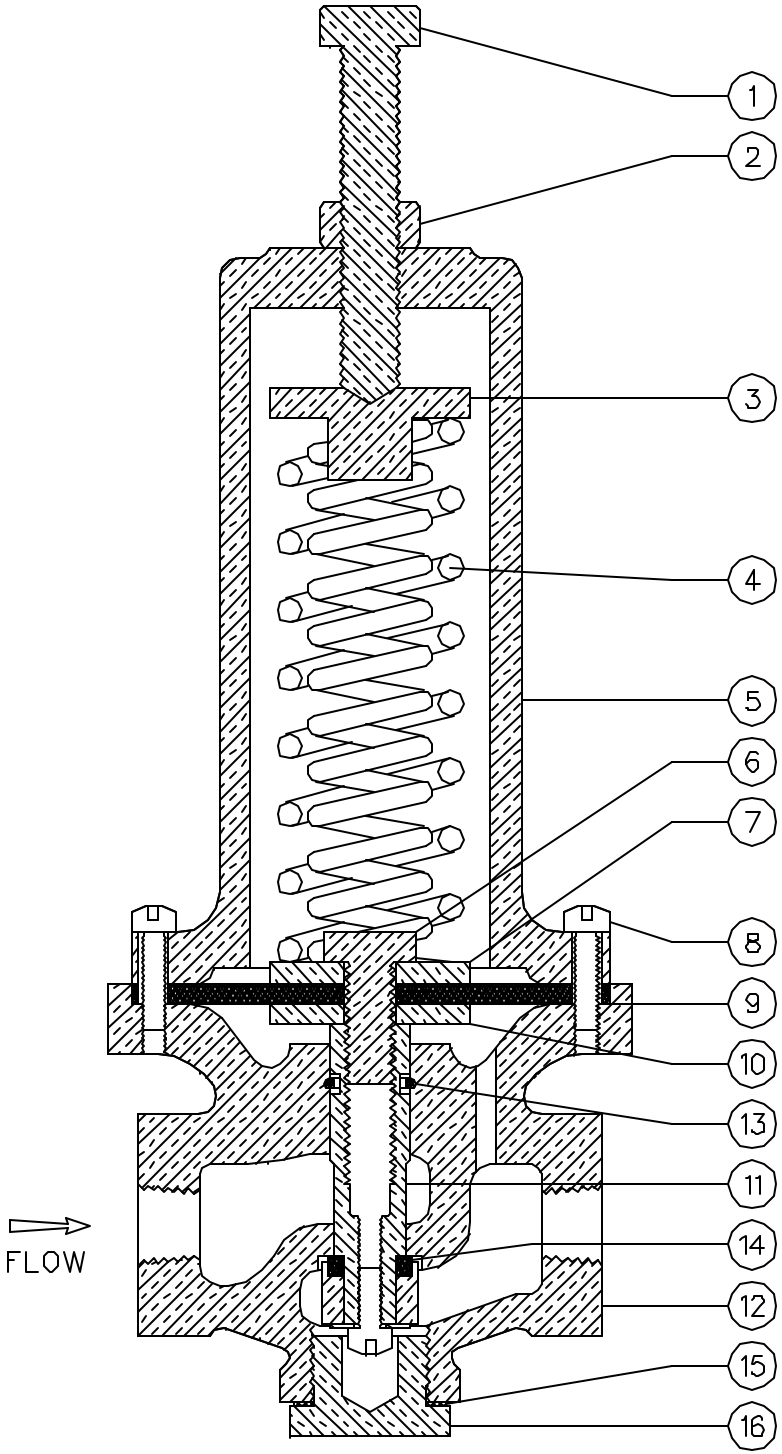
PART	DESCRIPTION	QTY	MATERIAL
1	PLUG	1	BRONZE
2	BOLTS - COVER	VARY	BRONZE
3	COVER	1	BRONZE
4	GASKET - COVER	1	COMPOSITION
5	CUP FOLLOWER	1	BRONZE
6	CUP PACKING	1	LEATHER
7	GUIDE SPRING	1	STAINLESS STEEL
8	STEM	1	BRONZE
9	SEAT PACKING	1	POLY
10	SEAT DISC	1	BRONZE
11	STRAINER/ORIFICE	1	STAINLESS STEEL
12	SHELL	1	CAST IRON
13	DRAIN PLUG	1	BRONZE
14	DISC NUT	1	BRONZE
15	SEAT RING	1	BRONZE
16	CYLINDER LINER	1	COMPOSITE
18	ISOLATION VALVE	1	BRONZE
19	PILOT VALVE	1	BRONZE
20	INDICATOR ROD	OPTION	BRONZE
21	INDICATOR STUFFING BOX	OPTION	BRONZE

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

NO SCALE	DRAWING 23WR-1
DATE 2-10-52 1037	REVISED 12-2-96

MODEL 23WR FIGURE 1
PRESSURE REDUCING VALVE

FILE: 23WRIS



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 23WR 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 diaphragm (9). Pressure above the diaphragm is set by the adjusting screw (1) acting on the adjusting springs (4). Pressure beneath the diaphragm is exerted hydraulically from the outlet throat of the pilot valve through a sensing port in the valve shell (12).

When the pilot valve senses a low outlet pressure, the spring force causes the diaphragm (9) and the entire stem assembly (11) to move down. This pushes the seat packing (14) away from the seat, allowing water to escape from the main valve operating chamber. 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 on the adjusting springs (4), the hydraulic force overcomes the spring force and the diaphragm (9) and stem assembly (11) are pushed upwards. This closes the pilot and traps water in the main valve operating chamber, causing the piston of the main valve to close.

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

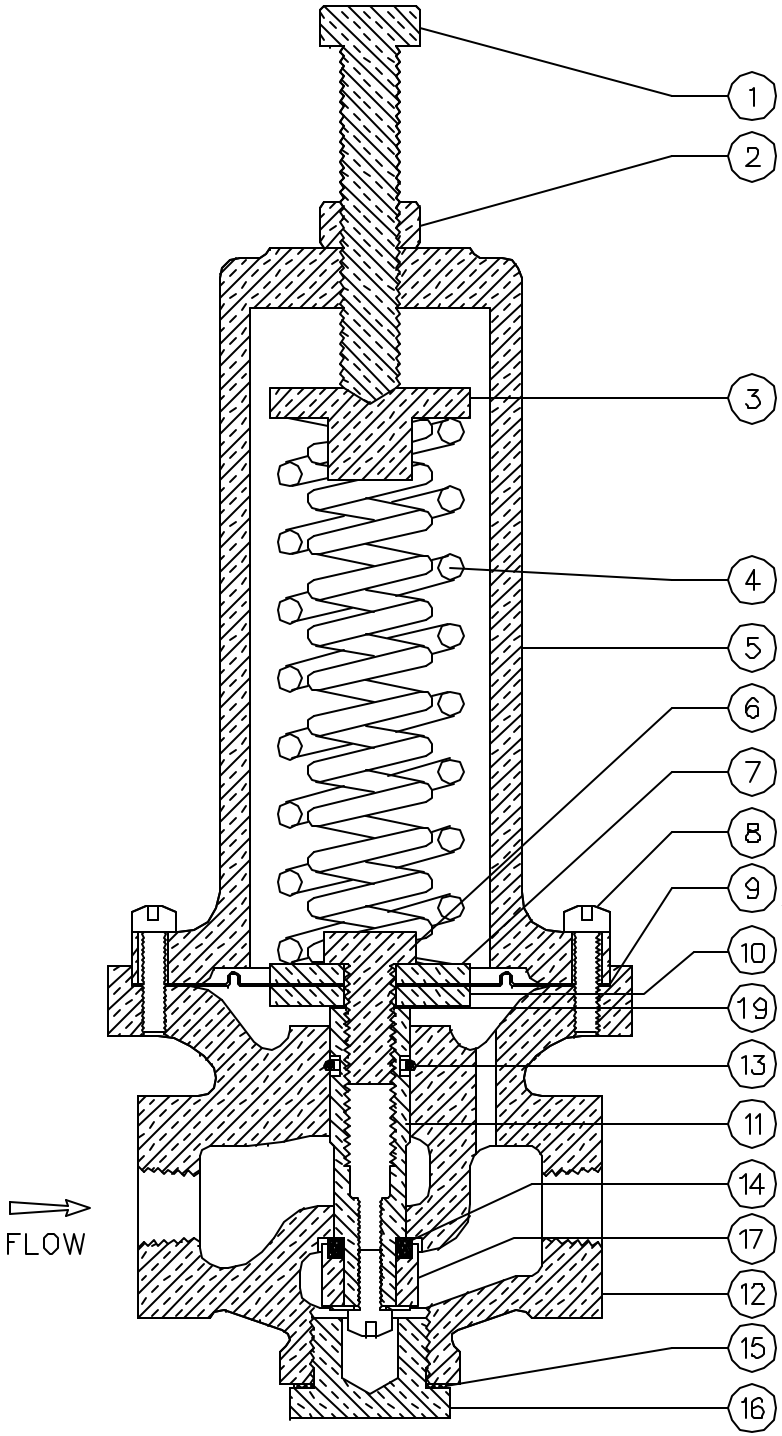
PART	DESCRIPTION	QTY	MATERIAL
1	ADJUSTING SCREW	1	BRONZE
2	LOCK NUT	1	BRONZE
3	SPRING WASHER	1	BRONZE
4	ADJUSTING SPRING	VARY	STEEL
5	SPRING CHAMBER	1	BRONZE
6	DIAPHRAGM BOLT	1	BRONZE
7	DIAPHRAGM BUTTON	1	BRONZE
8	BOLTS – CHAMBER	9	BRONZE
9	DIAPHRAGM	1	NEOPRENE
10	DIAPHRAGM WASHER	1	BRONZE
11	STEM ASSEMBLY	1	BRONZE
12	SHELL	1	BRONZE
13	O–RING	1	BUNA–N
14	SEAT PACKING	1	POLY
15	BOTTOM CAP GASKET	1	COMPOSITION
16	BOTTOM CAP	1	BRONZE

ROSS VALVE Mfg. Co., Inc.
6 OAKWOOD AVENUE – P.O. BOX 595 – TROY, NEW YORK, 12181 – TEL. (518) 274 0961

NO SCALE	DRAWING 23WR PILOT
DATE 5–17–57	REVISED 8–30–00 TJS

MODEL 23WR PILOT VALVE
PRESSURE REDUCING

FILE: P23WR



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

NOTE: Place #9 Diaphragm As Shown w/ Rib Facing Up.

PART	DESCRIPTION	QTY	MATERIAL
1	ADJUSTING SCREW	1	BRONZE
2	LOCK NUT	1	BRONZE
3	SPRING WASHER	1	BRONZE
4	ADJUSTING SPRING	VARY	STEEL
5	SPRING CHAMBER	1	BRONZE
6	DIAPHRAGM BOLT	1	BRONZE
7	DIAPHRAGM BUTTON	1	BRONZE
8	BOLTS – CHAMBER	9	BRONZE
* 9	DIAPHRAGM, BELLO	1	NITRILE
10	DIAPHRAGM WASHER	1	BRONZE
* 11	STEM	1	BRONZE
12	SHELL	1	BRONZE
* 13	O-RING	1	BUNA-N
* 14	SEAT PACKING	1	POLYURETHANE
* 15	BOTTOM CAP GASKET	1	COMPOSITION
16	BOTTOM CAP	1	BRONZE
* 17	FOLLOWER, WASHER, & SCREW	1	BRONZE
* 19	GASKET, STEM/WASH	1	COMPOSITION

* Included in repair kit

ROSS VALVE Mfg. Co., Inc.
6 OAKWOOD AVENUE – P.O. BOX 595 – TROY, NEW YORK, 12181 – TEL. (518) 274 0961

NO SCALE	DRAWING 23WR PILOT
DATE 5-17-57	REVISED 6-26-01 DMB

MODEL 23WR PILOT VALVE
PRESSURE REDUCING
WITH BELLOFRAM DIAPHRAGM

FILE: P23WRBELLO

BRONZE NPT "Y" STRAINERS

59 SERIES (85-5-5-5 BRONZE)

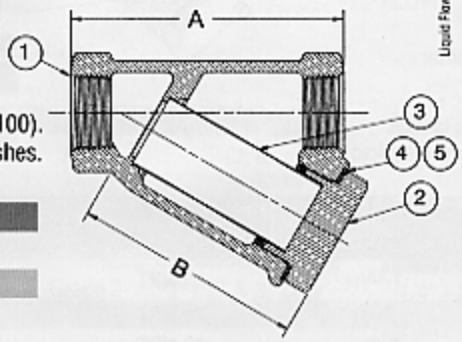
Conbraco's 59 Series "Y" strainers are lightweight and compact. All sizes offer maximum protection against foreign particles in piping systems and process equipment. Cast bronze body and stainless steel screens are completely corrosion resistant. Self-aligning screen is easily accessed for cleaning or service. Operating pressures up to 400 psi make the 59 Series an excellent choice as a versatile, multi-purpose strainer. Sizes 1/8" to 1/2" are perfect for OEM applications and are available as U.L. recognized components for use as a secondary strainer on oil burning equipment.

No.	Part	Material	ASTM Spec	Remarks
1	Body	Bronze	B62	
2	Cover	Bronze	B62	
3	*Screen	Stainless Steel		Type 304
4	*Gasket	TFE (3/4"-4")		
5	* O-Ring	Silicone (1/8"-1/2")		

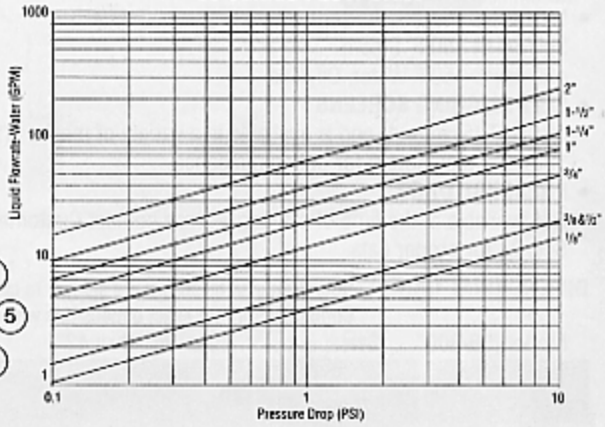
* Recommended spare parts

- **WORKING PRESSURE (non-shock):**
  300 psi @ 350°F Steam
  400 psi @ 150°F Water, Oil, Gas
- **SELF ALIGNING SCREENS**
  304 SST (Standard) available in a large variety of meshes (thru 100). Contact factory for optional meshes.
- *** STANDARD SCREENS:**

Size	Screen Opening
1/8" - 1/2"	50 Mesh
3/4" - 3"	20 Mesh
4"	.125 Perf.



59 SERIES FLOW DATA



DIMENSIONAL DATA Note: Dimensions shown are subject to change. Contact factory for exact dimensions when required.

Model "59-000" NPT Sizes 1/8" thru 4"

Model	Size	A	B	Tapped Cap (Suffix-02)	Wt./100	Screen Area (IN^2)
59-000-01	1/8"	2	1-1/4	1/8 NPT	44.5	1.38
59-001-01	1/4"	2	1-3/4	1/8 NPT	42.5	1.38
59-002-01	3/8"	2-11/16	2	1/4 NPT	78.6	3.19
59-003-01	1/2"	2-11/16	2	1/4 NPT	75.1	3.19
59-004-01	3/4"	3-7/8	3-1/4	1/2 NPT	174	8.18
59-005-01	1"	4-3/4	4	3/4 NPT	276	12.9
59-006-01	1-1/4"	5-1/8	4-1/4	3/4 NPT	358	16.2
59-007-01	1-1/2"	5-3/4	5	1 NPT	541	22.8
59-008-01	2"	6-3/4	6	1-1/4 NPT	747	32.7
59-009-01	2-1/2"	7-15/16	5-7/8	1-1/4 NPT	1130	47.3
59-010-01	3"	9-1/8	6-7/8	1-1/2 NPT	1580	64.8
59-011-01	4"	11-15/16	10-1/8	1-1/2 NPT	3070	115
Model "59-UL"	NPT	Sizes 1/8" thru 1/2"				
59-UL0-01	1/8"	2	1-1/4	1/8 NPT	44.5	1.38
59-UL1-01	1/4"	2	1-3/4	1/8 NPT	42.5	1.38
59-UL2-01	3/8"	2-11/16	2	1/4 NPT	78.6	3.19
59-UL3-01	1/2"	2-11/16	2	1/4 NPT	75.1	3.19

Features

Stem Designs
- Vee—all series
- Soft-seat—all series
- Regulating—O, 1, and 18 series

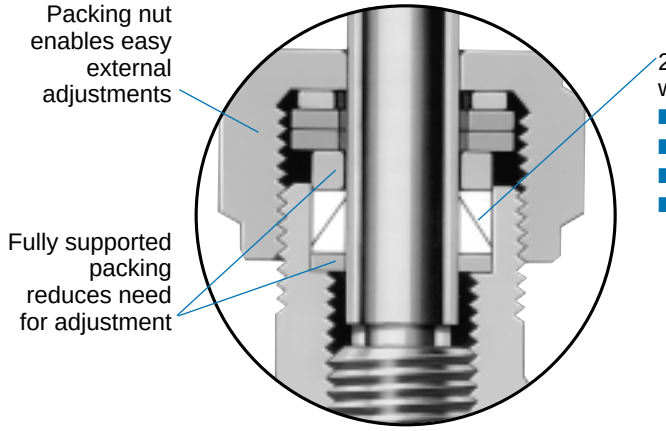
Orifice Sizes
- From 0.080 to 0.375 in. (2.0 to 9.5 mm)

Flow Coefficients (C_v)
- From 0.09 to 1.80

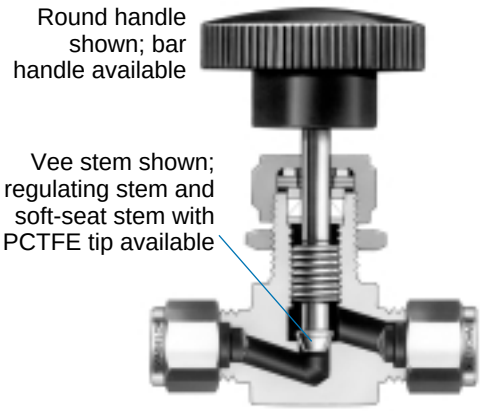
Flow Patterns
- Straight, angle, and cross patterns

Panel Mounting
- O, 1, and 18 series

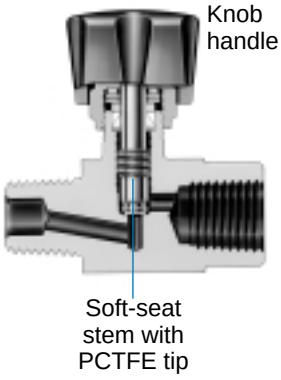
Live-Loaded Packing System



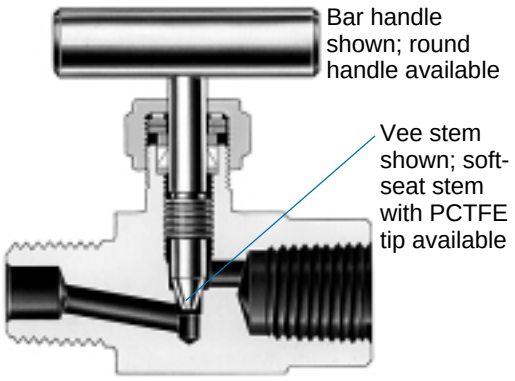
O, 1, and 18 Series



20K Series



20V and 26 Series



Pressure-Temperature Ratings

Valves are standard with PFA stem packing. Ratings are based on PEEK stem packing. Ratings are limited to:
- 200°F (93°C) max with PCTFE stem tip.
- 250°F (121°C) max with UHMWPE stem packing.
- 450°F (232°C) max with PFA stem packing.

To order other packing materials, see **Options and Accessories,** page 7.

O, 1, and 18 Series

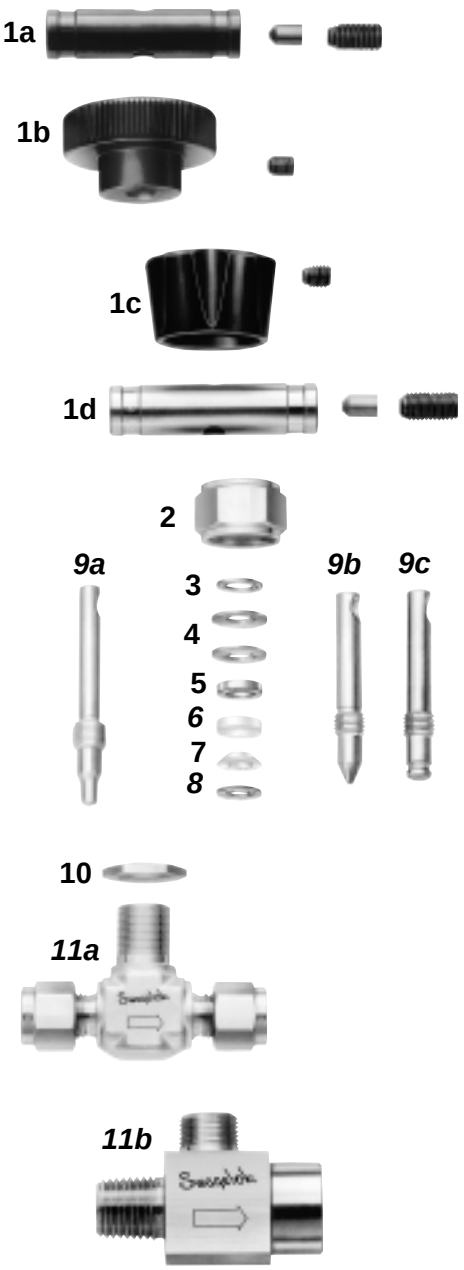
ASME Class	2080	N/A		1500
Material Group	2.2	N/A		3.4
Material Name	316 SS	Brass	Steel	Alloy 400
Temperature, °F (°C)	Working pressure, psig (bar)			
–65 (–53) to –20 (–28)	5000 (344)	3000 (206)	—	3000 (206)
100 (37)	5000 (344)	3000 (206)	3000 (206)	3000 (206)
200 (93)	4295 (295)	2350 (161)	2730 (188)	2640 (181)
250 (121)	4085 (281)	2200 (151)	2695 (185)	2555 (176)
300 (148)	3875 (266)	2050 (141)	2660 (183)	2470 (170)
350 (176)	3715 (255)	1470 (191)	2615 (180)	2430 (167)
400 (204)	3560 (245)	390 (26)	—	2390 (164)
450 (232)	3435 (236)	—	—	2380 (163)
500 (260)	3310 (228)	—	—	2375 (163)
600 (315)	3130 (215)	—	—	—

20 and 26 Series

ASME Class	2500
Material Group	2.2
Material Name	316 SS
Temperature °F (°C)	Working pressure psig (bar)
–65 (–53) to 100 (37)	6000 (413)
200 (93)	5160 (355)
250 (121)	4910 (338)
300 (148)	4660 (321)
350 (176)	4470 (307)
400 (204)	4280 (294)
450 (232)	4130 (284)
500 (260)	3980 (274)
600 (315)	3760 (259)

For more information about ASME classes, material groups, and ratings, see the *Swagelok® Valve Pressure-Temperature Ratings* technical bulletin.
For more information about pressure ratings of valves with tube fitting end connections, see the *Swagelok Tubing Data* or *Metric Tubing Data* catalog.

Materials of Construction



Component	Series	Valve Body Materials			
		Material Grade/ASTM Specification			
		316 SS	Brass	Steel	Alloy 400
1a Bar handle	18	Anodized aluminum 7129/B221			
Handle pin Set screw		S17400/A564			
1b Round handle	O and 1	Phenolic with brass insert			
Set screw		S17400/A564			
1c Knob handle	20K	Anodized aluminum 7129/B221	—		
Set screw		S17400/A564			
1d Bar handle	20V and 26	316 SS/A276	—		
Handle pin Set screw		S17400/A564			
2 Packing nut	All	316 SS/A276	Brass 360/ B16	12L14/ A108	Alloy R-405/ B164
3 Gland	O, 1,① and 20	304 SS/A240, A167			
4 Packing springs	All②	S17700/A693			
5 Packing gland	All	316 SS/A276, A167, B783			
6 *Upper packing*	All	*PFA/D3307*			
7 *Lower packing*					
8 *Lower gland*	All	*316 SS/A167*			*Alloy 400/ B127*
9a *Regulating stem*	O, 1, and 18	*316 SS/A276*			*Alloy R-405/ B164*
9b *Vee stem*	All	*Chrome-plated③ 316 SS/A276*			
9c *Soft-seat stem*	All	*316 SS/A276*			
Stem tip		*PCTFE/D1430*			
10 Panel nut	O, 1, and 18	316 SS	Brass 360/B16		316 SS
11a *Body*	O, 1, and 18	*316 SS/A182*	*Brass 377/ B283*	*Cadmium-plated 11L17/ A108*	*Alloy 400/ B564*
11b *Body*	20 and 26	*316 SS/A479*	—		
Lubricant	All	*Tungsten disulfide and fluorocarbon based*			

Wetted components listed in *italics.*
See the NACE specification for information on stainless tube fitting requirements
Valve series listed with standard handles. For handle options, see **Handles,** page 8.
① 1 series valves with orifice of 0.172 in. (4.4 mm).
② O and 20 series—2 springs; 1, 18, and 26 series—3 springs.
③ Stem tip and threads.

Testing

Every integral-bonnet needle valve is factory tested with nitrogen at 1000 psig (69 bar). Seats have a maximum allowable leak rate of 0.1 std cm^3/min. Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

Cleaning and Packaging

Every integral-bonnet needle valve is cleaned and packaged in accordance with Swagelok Specification SC-10. Special cleaning and packaging in accordance with Swagelok Specification SC-11 is available as an option.

ROSS MODEL 23WR – PILOT OPERATED PRESSURE REDUCING VALVE

PREVENTIVE MAINTENANCE

EVERY 2 MONTHS

1. Visually inspect for leakage around indicator rod and pilot valve.
2. Flush the strainer (#25) via the flushing cock.
3. Flush the needle valve (#17) - turn needle clockwise ½ turn, counter-clockwise 2 turns, then clockwise 1-½ turns to original setting.

EVERY 6 MONTHS

1. Isolate valve, relieve pressure trapped in valve. Remove bottom plug with deep socket and inspect.
2. Remove strainer screen, inspect and clean.
3. Same visual inspection as above.

LUBRICATION

None required.

SPARE PARTS

None required, recommended or supplied unless specified. Under normal operating conditions, no spare parts would be necessary within five 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 name tag pinned to the top of the main valve).

TROUBLESHOOTING

The first step in trouble shooting is to isolate the main valve from the controls to determine where the problem is. To do this, the basic hydraulic operating principal should be reviewed. The valve operates as follows: by introducing water to the top of the main valve and not allowing any water out - the valve should close by taking water off the top of the main valve and not allowing any water on - the valve should be open.

TO MANUALLY CLOSE VALVE

Isolation valves are supplied in the control piping. To close the valve, slowly close the downstream isolation valve in the control piping. This will override the pilot valve and force all the control water onto the top of the valve. If valve does not close, verify that water is able to pass through the inlet controls (isolation valve, needle valve/orifice, strainer). This can be accomplished by breaking the compression fitting at the top of the valve entering the top cap of the valve. Once flow is verified to the top cap, and the valve will not close, the problem is in the main valve. At this point, disassembly of the main valve is required.

TO MANUALLY OPEN VALVE

Note: Caution should be exercised when manually opening any automatic control valve as to the consequences of an open valve situation, In the pressure reducing valve, high pressure inlet water will travel unrestricted downstream. High pressures can be compensated for by throttling the inlet main line isolation valve.

The isolation valves once again must be utilized. Close both isolation valves in the control piping, and break the compression fitting at the top cap. This will release any pressure over the main valve causing the valve top open. A small amount of water should bleed out of the broken connection ant the valve should open. Once the valve becomes full open, the water should stop bleeding out of the open connection. If water continues to flow out of the pipe from the top cap, the main valve diaphragm has therefore lost its seal. The main valve should at this point be disassembled.

Note: When leaving the job in the automatic mode, make sure that all isolation valves are returned to their original position (in most cases open).

Pilot Valve - Pilot valve is the main device that is used to control the outlet (downstream) pressure. It operates with the outlet (downstream) pressure under a diaphragm balanced by a spring load above the diaphragm. If the outlet (downstream) pressure is above the pilot setting (compression of springs), the pilot valve seat will close, therefore forcing water on top of the main valve to close it. If the outlet pressure is below the spring setting, the pilot valve will open. Once the flow through the pilot valve exceeds the flow through the orifice/needle valve, a low pressure will occur over the main valve and the valve will open.

To increase outlet (downstream) pressure - turn pilot valve adjusting screw clockwise.

To lower outlet (downstream) pressure - turn pilot valve adjusting screw counterclockwise.

If pilot valve is determined to be faulty - it is recommended that it be returned to the factory for repair.

Strainer - A strainer is used in the control piping to protect the controls. The strainer screen should periodically be removed and cleaned.

Needle Valve/Orifice - These items are used as metering devices for the flow through the valve controls. They are factory set and should not be adjusted in the field. Consult factory for specific setting of individual if required.

ROSS MODEL 23WR – PILOT OPERATED PRESSURE REDUCING VALVE

TROUBLESHOOTING

When valve does not close and excessive discharge pressure occurs:

1. Incorrect pilot adjustment: Turn adjusting screw on pilot counter-clockwise until valve closes
2. Fouled strainer and/or needle valve: Remove and clean.
3. Diaphragms in pilot have ruptured: Replace diaphragms
4. Stick or stones lodged under seat: Dismantle and rebuild valve.
5. Internal leakage in the main valve past the cup leather: Dismantle and rebuild valve.

When valve will not open:

1. Incorrect pilot adjustment: Turn adjusting screw clockwise until valve opens.

INTERNAL REPAIRS

Some repairs may be made, and parts replaced without removing valve from the main line. Internal repairs are made by removing the top cover of valve. All internals are accessible through top of valve.

1. Shut inlet main line isolation valve.
2. Shut outlet main line isolation valve.
3. De-pressurize valve.
4. Remove plug (#1) or optional indicator rod (#20) by inserting a nail through hole and unscrew. ***Do not*** pull through optional stuffing box (#21).
5. Remove top cover bolts (#2) and top cover (#3).
6. Withdraw stem assembly.
7. Inspect cylinder liner (#16) for scoring. May be smoothed with fine wet emery. Inspect seat ring (#15) for damage.
8. Secure stem assembly. Loosen cup follower (#5) and remove. Replace cup packing (#6) – the cup is impregnated with lubricants so no external lubrication is necessary. Remove seat disc (#10). Replace seat packing (#9).
9. Remove strainer screen and clean or replace.
10. Re-insert stem assembly, and replace top cover and pilot assembly.
11. Restore water pressure by opening the discharge isolation valve first, so that high inlet pressure is not trapped against the closed outlet valve.
12. Open inlet isolation valve *slowl*y.

All replaceable packings and gaskets are stock items, and may be ordered as a repair kit for Valve Serial Number S_____. They are available for ground or next-day delivery.