

**SUBMITTAL NOTES**

**PROJECT:** \_\_\_\_\_

**Ross Model 40WR – Pilot Operated Pressure Reducing Valve**

**Size:** \_\_\_\_\_ inch / mm

Every Ross Valve shall be hydrostatically tested for body integrity and tight seating at the factory prior to shipment. Field operating conditions are simulated, and the controls are adjusted for proper operation. In order to design and test each valve under operating conditions similar to those in the field, please complete / confirm the following:

- Inlet (supply) pressure \_\_\_\_\_ psi
- Outlet (downstream) pressure \_\_\_\_\_ psi

The Ross Globe Body Style Valve can be installed in any position. In order to properly design the valve and orient the controls, please confirm the physical layout of the installation. (\*\* Designates standard valve orientation.)

Valve inlet & outlet (flow) :             Horizontal \*\*            or             Vertical  
 Valve piston axis :             Vertical \*\*    or     Horizontal             Horizontal

The valve shall be furnished with:

- ANSI B16.1 Class 250 cast iron body & cap, with:             Class 125 flanges             Class 250 flanges
- Internal metal parts - Bronze construction
- Ross Model 40WR Hydraulic Pressure Reducing Pilot Valve (part #19). Initial Setting: \_\_\_\_\_ psi.
- Ross Model 5F2 Strainer (part #25) with Stainless Steel Filter Element and Blow-Off
- Ross Standard Coarse-Thread Needle Valve (part #17)
- Isolation valves: 0.5" Ball Valves, Bronze/Stainless Steel (part #18)
- Position Indicator, Bronze (part #20)
- Red brass pipe fittings and rigid control piping
- Tapped ports with gauge cocks on inlet & outlet (gauges by others)
- PAINTING: Ferrous surfaces of valve shall be coated with ANSI/NSF Standard 61 Certified Epoxy (Tnemec Series FC20)  
 - Meets the performance requirements of AWWA D102 Inside System No. 1.
- Operation & Maintenance Manual (shipped with the valve).
- Other (Code / Description) \_\_\_\_\_ / \_\_\_\_\_

(Please list any additional features that are required. A representative may need to contact you for any relevant operating data.)

The valve will be constructed with materials and options stated on this notes page & cut view drawing & quote only, any changes or adders will be reviewed by Ross Valve Mfg. Co., Inc. with possible additional charges to quoted valve pricing. All information following the cut view drawing is for general information. Any special submittal requirements will be an additional charge to purchaser. The Ross Valve Mfg. Co., Inc. reserves the right to modify valve construction which will result in equal or superior performance to existing designs. These modifications may be made at any time and at the sole discretion of the manufacturer.

# PRESSURE REDUCING VALVE

**Purpose:** Control outlet pressure

**Model Number:** 40WR

**Sizes:** 4" - 48"

**Type:** Throttling

**Primarily Controlled By:**

Hydraulic pressure

**Located:** In line

**Purpose:** To prevent outlet pressure from exceeding a preset maximum level

**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:**

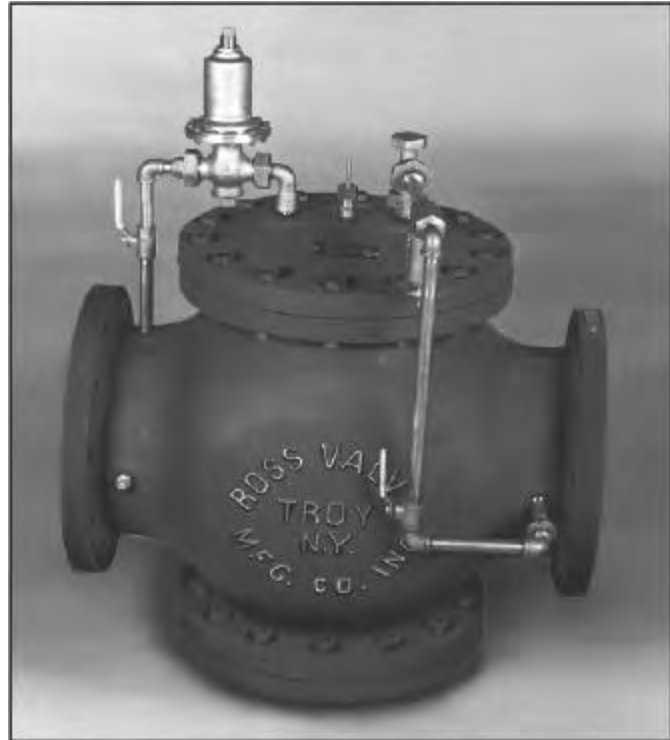
**Strainer:** Model 5F-2

**Valves:**

*Needle*

*Pilot:* Pressure Reducing: Model 40WR

With internal sensing port or equipped to receive a separate sensing line.



## Customized Features

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

### Code

**ACAV** - Anti-cavitation Trim

**CI** - Check Feature (Internal)

**CE** - Check Feature (Cushioned)

**R** - Reverse Flow Feature

**PR** - Dual Pilot: Second Pressure Reducing Pilot Valve

**BP** - Back Pressure Sustaining Pilot Valve

**SC** or **SO** - Solenoid Pilot Valve: 2 Way

**SG** or **SF** - Solenoid Pilot Valve: 3 Way

**M** - Reversible Electric Motor

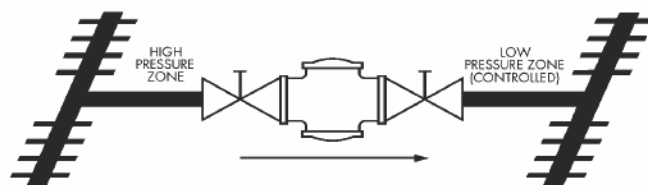
**ES** - Higher Efficiency Strainer

**LS** - Limit Switch

**SS** - Stainless Steel Trim

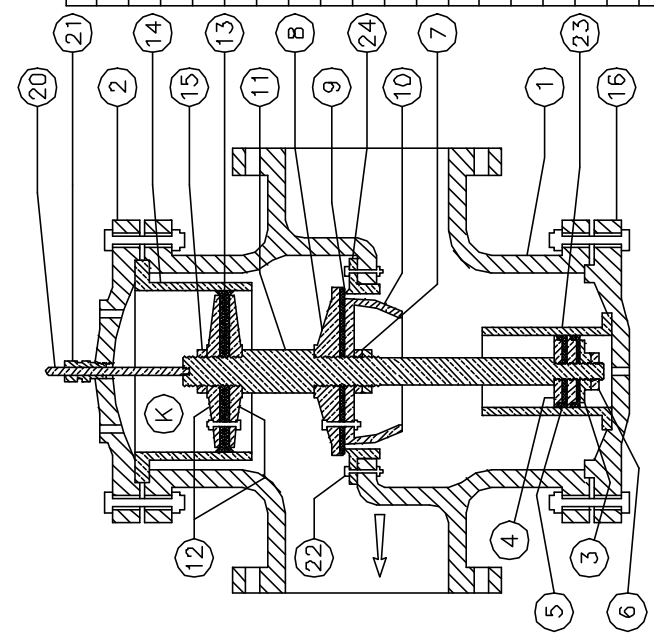
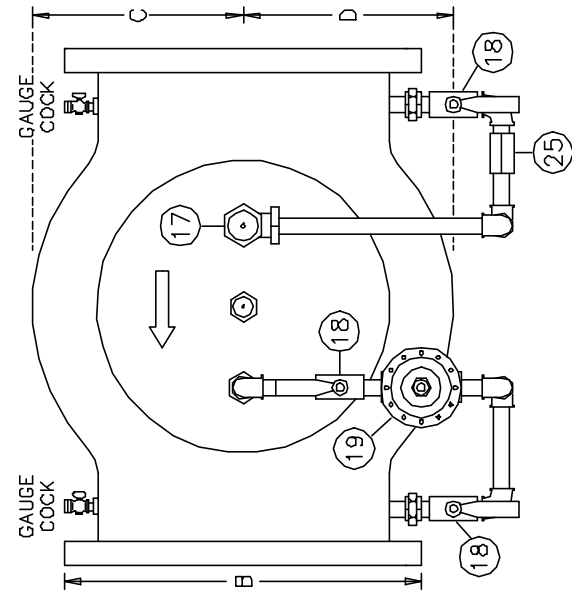
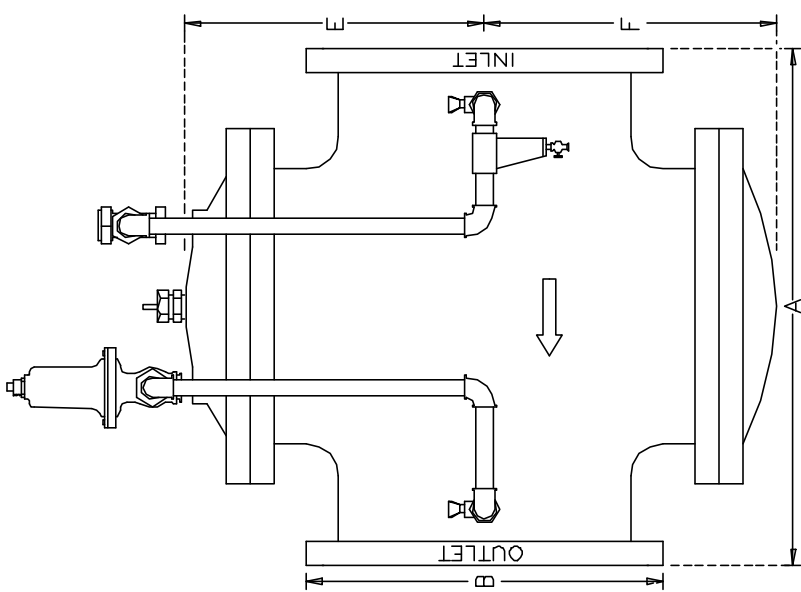
## Basic Application

Control systems where the supply (inlet) pressure is higher than the discharge 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.



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
17	NEEDLE VALVE	1	BRONZE
18	ISOLATION VALVE	3	BRONZE
19	PILOT VALVE - PRESSURE REDUCING	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
	BOLTS & NUTS (TOP & BOTTOM CAP)	VARY	STEEL
	BOLTS & NUTS (CUP PLATES)	VARY	BRONZE
	BOLTS (BOTTOM CAP CYLINDER)	VARY	BRONZE
	INDICATOR ROD PACKING (SET)	1	TEFLON
	COVER & MAIN BUSHING GASKETS	3	COMPOSITION
	STEM GASKETS	3	COMPOSITION

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	

**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

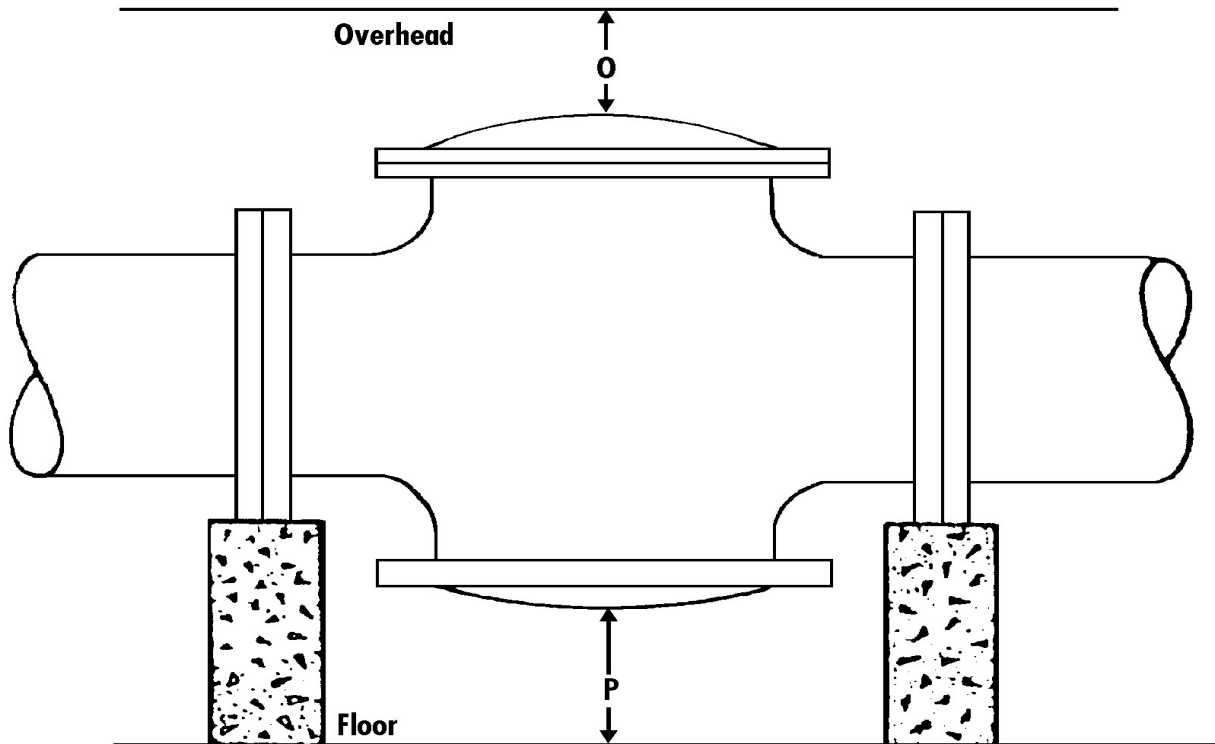
DRAWING 40WR      DATE 3/10/00  
 GLOBE BODY 4" - 36"      NO SCALE      FIGURE 1

Model 40WR  
 PRESSURE REDUCING VALVE

# 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"
<b>O</b>	14	16	18	21	23	28	28	33	33	36	43	46	54	60
<b>P</b>	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.

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.

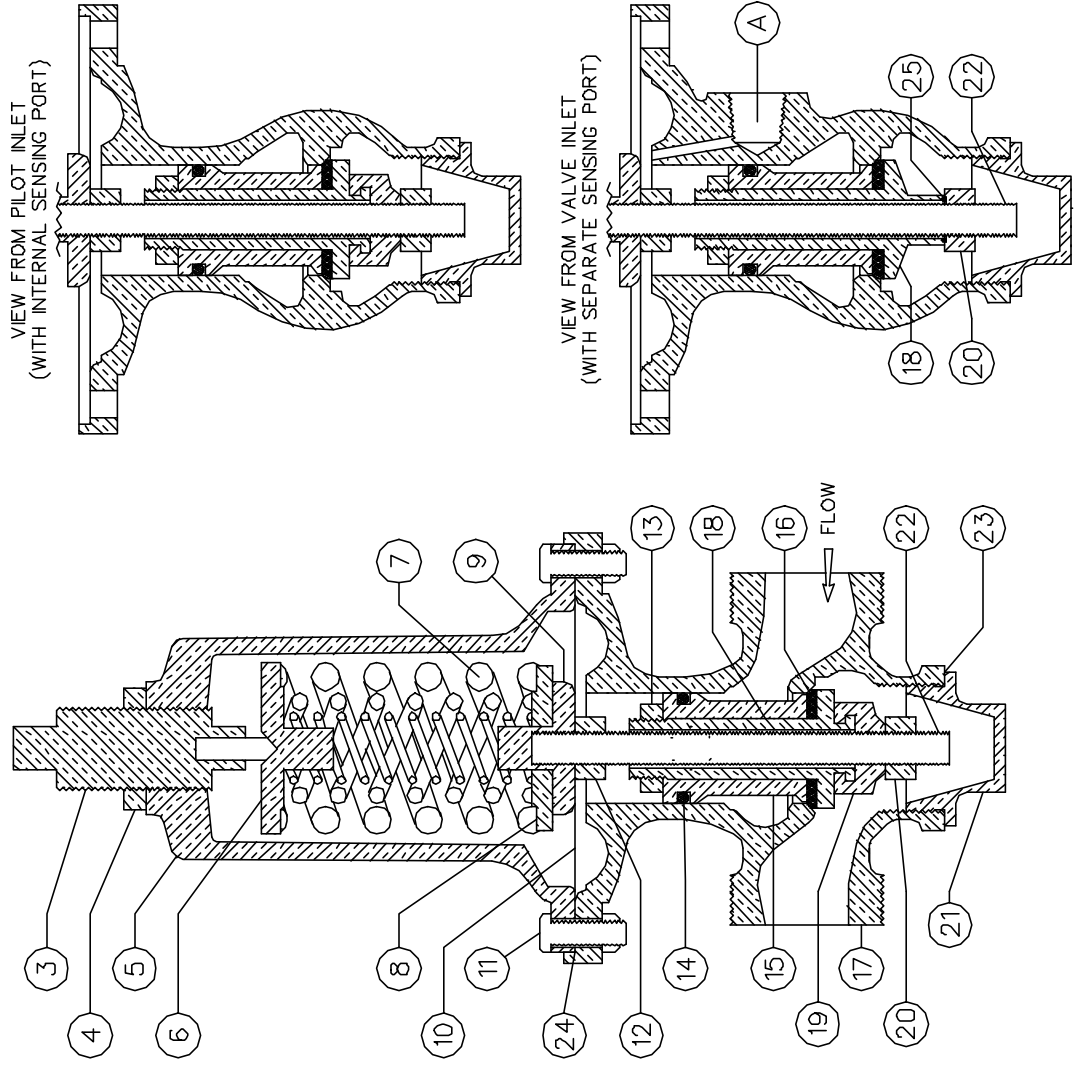
The pilot valve operates by creating a pressure balance across the diaphragms (#10). Pressure above the diaphragms is set by the regulating screw (#3) acting on the adjusting springs (#7). Pressure beneath the diaphragms is exerted hydraulically in one of two manners:

- 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 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 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

<b>ROSS VALVE Mfg. Co., Inc.</b>	
6 DAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274-0961	
NO SCALE	DRAWING 40WR PILOT
DATE 4-2-63	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

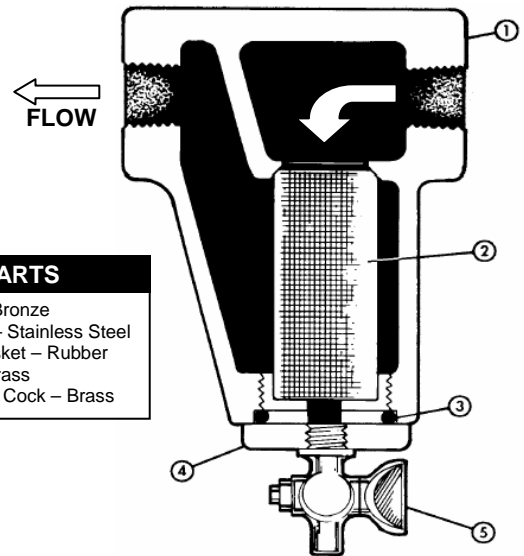
1. Strainer should be "blown down" frequently to remove collected foreign material from the sediment chamber.
2. Strainer screen should be removed occasionally for inspection and thorough cleaning.

## 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:

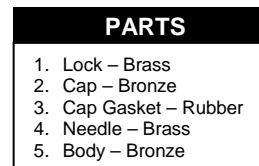
1. Remove the hex cap (#2) and lock (#1).
2. With a screw driver;
  - a. Turn the needle (#4) counter-clockwise to raise it
  - b. Turn the needle (#4) clockwise to lower it
3. Once the optimum position is determined, no further adjustment of the needle should be required.

## 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

