



SUBMITTAL NOTES

PROJECT: _____

Ross Model 23WR – 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, with:
 - FNPT threaded ends Class 125 flanges Class 250 flanges
- Cover and internal metal parts - Bronze construction with Stainless Steel Seat Ring (part #15)
- Ross Model 23WR Hydraulic Pressure Reducing Pilot Valve (part #19). Initial Setting: _____ psi.
- Conbraco Model 59-001-02 Strainer (part #25) with Stainless Steel Filter Element and Blow-Off
- Whitey Model B-1RM4 Needle Valve (part #17)
- Isolation valves: 1/4" Pet Cocks (part #18)
- Red brass pipe fittings and rigid control piping
- Tapped ports with gauge cocks on inlet & outlet (gauges by others)
- Optional: Position Indicator, Bronze (part #20)
- 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: 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.

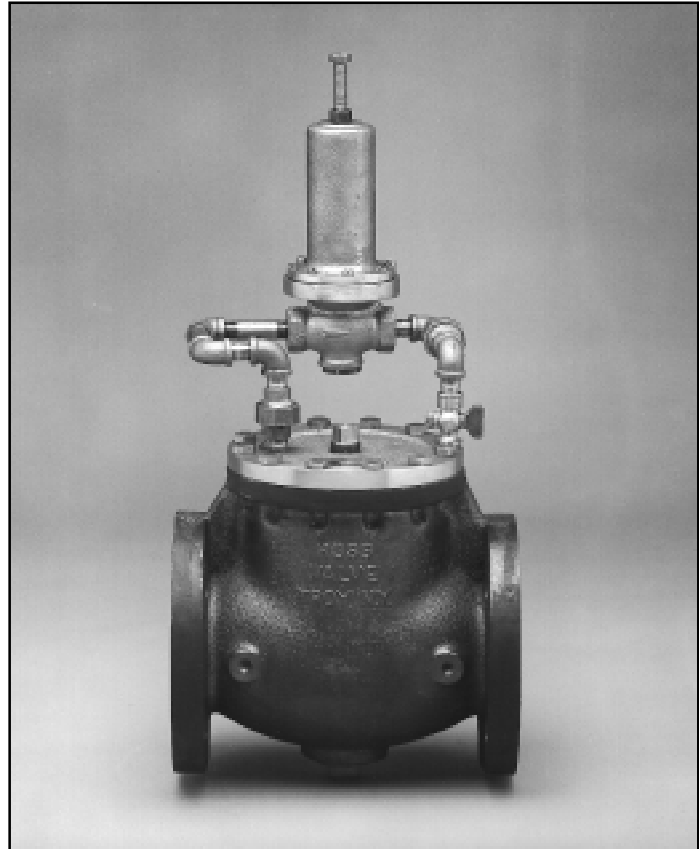
Options

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.

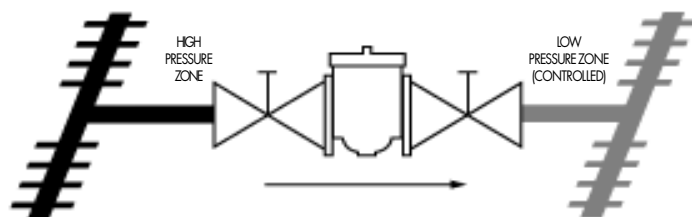
Code



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.

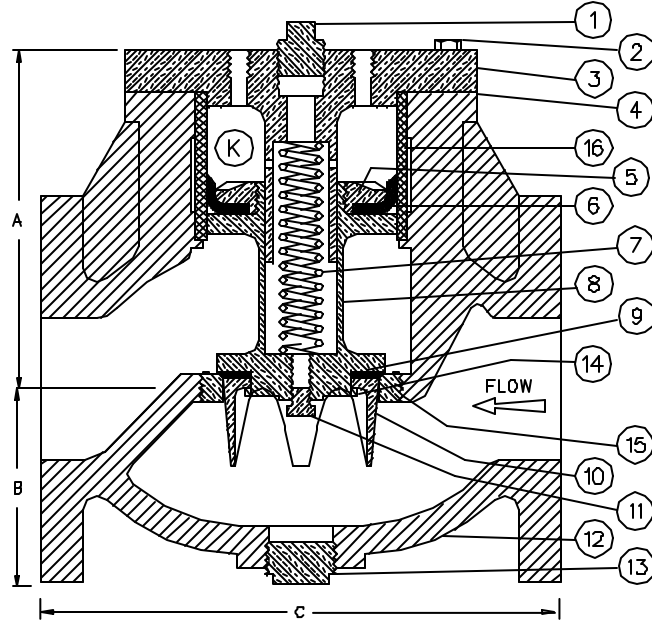
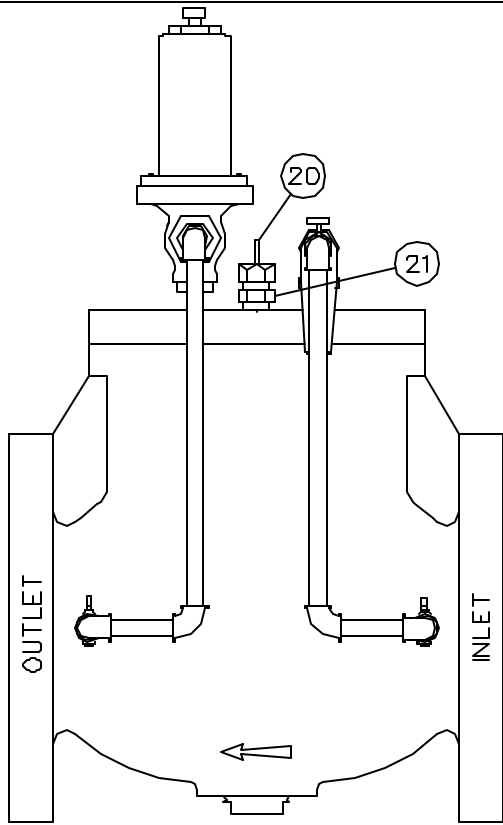
ROSS MODEL 23WR – PILOT OPERATED PRESSURE REDUCING VALVE

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).

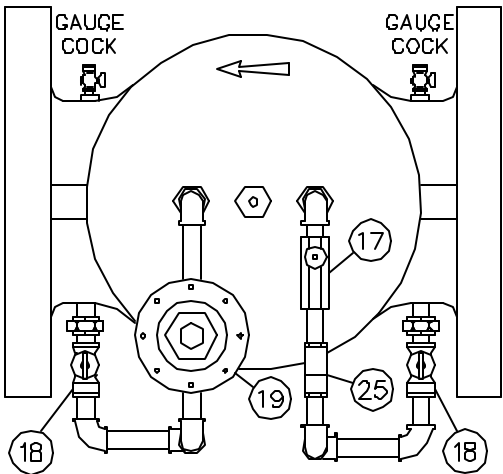
OPERATION:

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

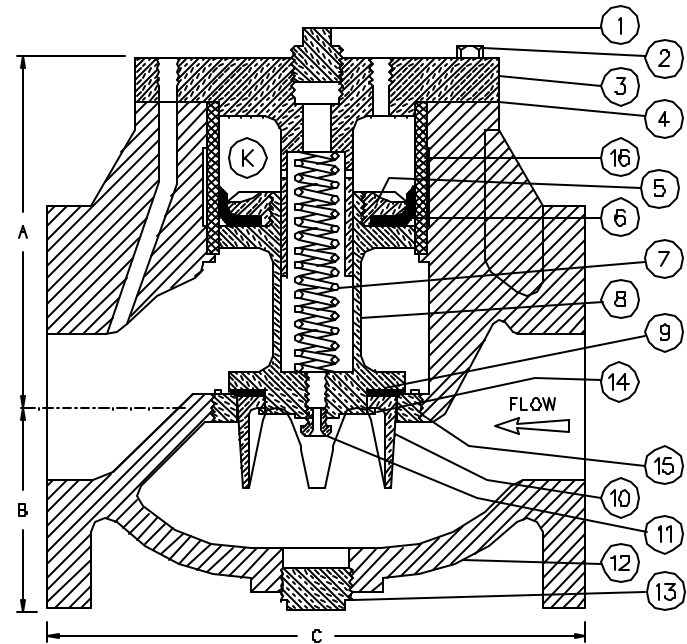
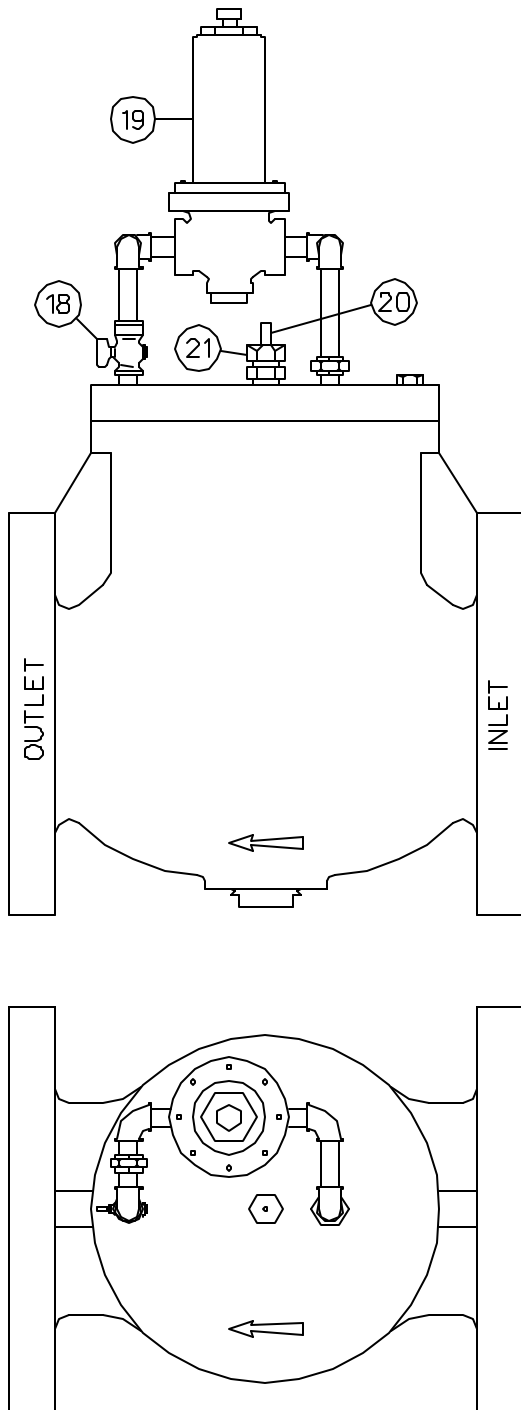
SIZE (INCHES)	ANSI CLASS	SHIPPING WEIGHT (LBS)	DIMENSIONS (INCHES)		
			A	B	C
1-1/2	125	35	4	3-1/4	7-5/8
	250	42	4	3-1/4	8-1/8
	NPT	30	4	3-1/4	8-3/8
2	125	55	5-1/2	3-1/2	8
	250	65	5-1/2	3-1/2	8-3/8
	NPT	50	5-1/2	3-1/2	8
2-1/2	125	75	6-1/2	4-1/2	9-1/4
	250	85	6-1/2	4-1/2	9-7/8
	NPT	70	6-1/2	4-1/2	9-1/4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



SIZE	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

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.

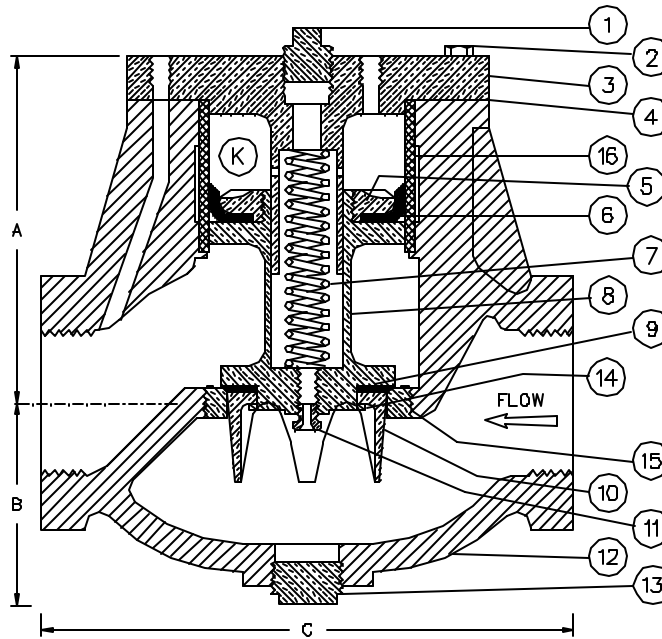
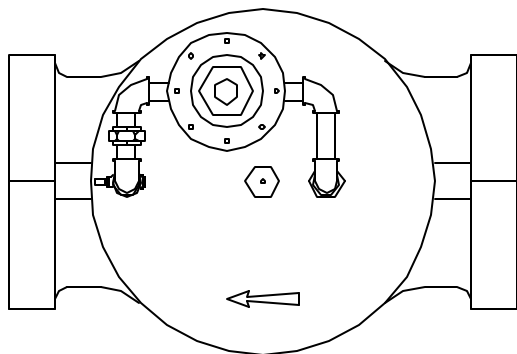
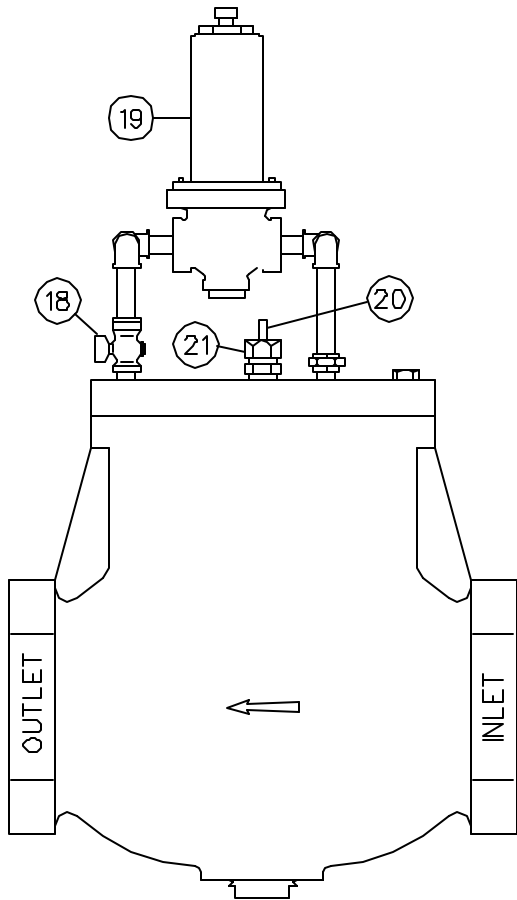
8 OAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274 0981

NO SCALE DRAWING 23WR-1

DATE 2-10-52 1037 REVISED 12-2-96

MODEL 23WR FIGURE 1
PRESSURE REDUCING VALVE

FILE: 23WR1



SIZE	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

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.

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NO SCALE

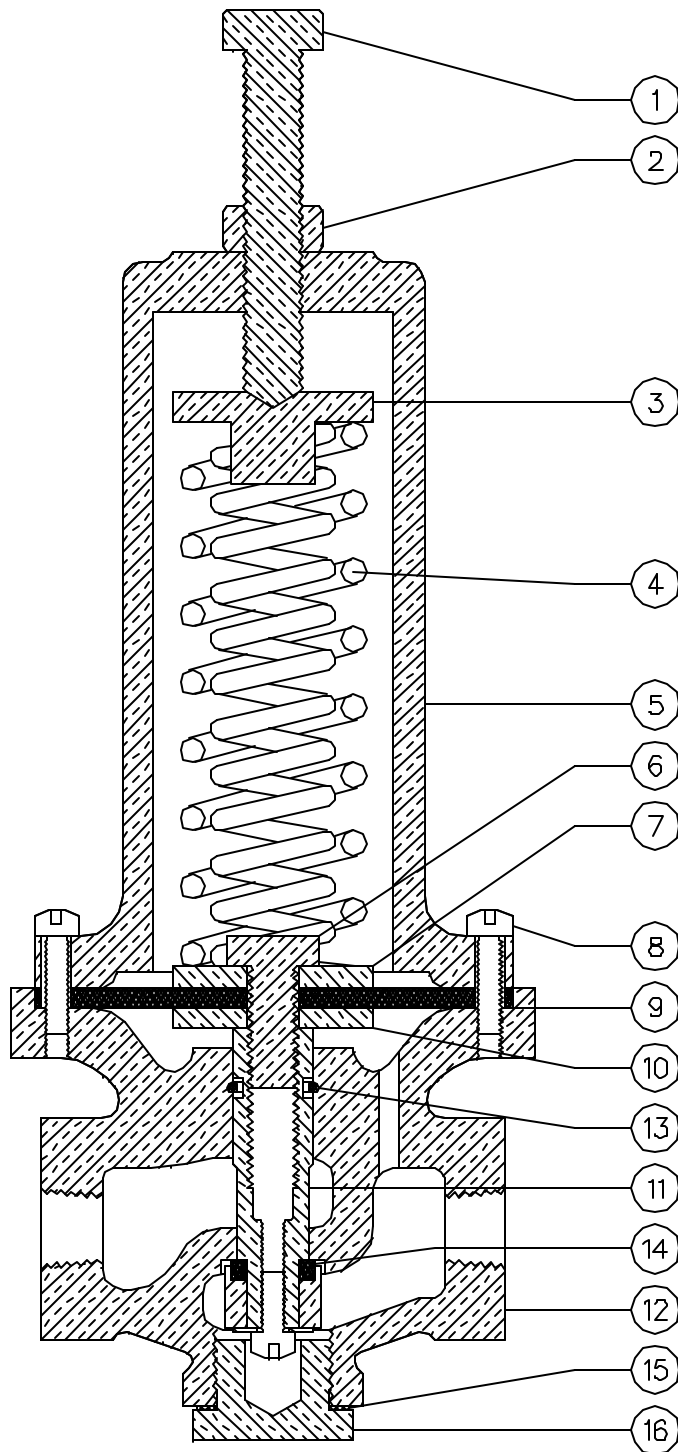
DRAWING 23WR-1

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

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 (1/4"-4")		
5	* O-Ring	Silicone (1/4"-1/2")		

* Recommended spare parts

• WORKING PRESSURE (non-shock):

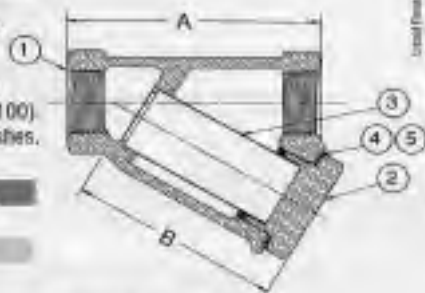
300 psi @ 350°F Steam
400 psi @ 150°F Water, Oil, Gas

• SELF ALIGNING SCREENS

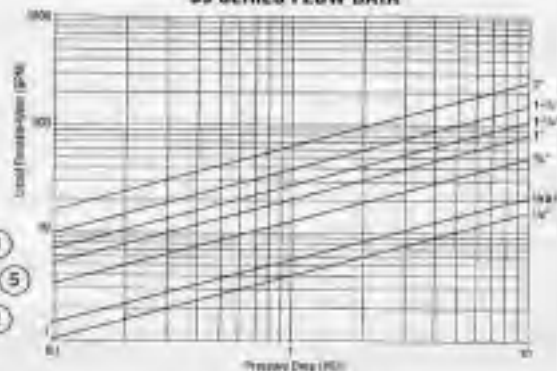
304 SST (Standard) available in a large variety of meshes (thru 100). Contact factory for optional meshes.

• 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	5/8"	3-7/8	3-1/4	1/2 NPT	174	8.16
59-005-01	1"	4-3/4	4	3/4 NPT	276	12.9
59-006-01	1-1/4"	5-7/8	4-3/4	3/4 NPT	358	16.2
59-007-01	1-1/2"	5-7/8	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"	7-11/16	5-7/8	1-1/4 NPT	1130	47.3
59-010-01	3"	9-7/8	6-1/8	1-1/2 NPT	1580	64.8
59-011-01	4"	11-5/8	10-1/4	1-1/2 NPT	3070	115

Model "59-UL" NPT Sizes 1/4" thru 1/2"

59-UL0-01	1/4"	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

WHITEY

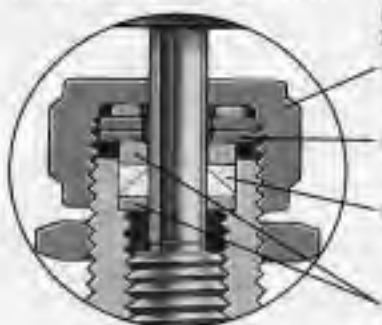
Swagelok
Catalog MS-01-43

Integral Bonnet Needle Valves

"0", "1" & "18" Series



FEATURES/BENEFITS



LIVE LOADED PACKING SYSTEM

- Packing nut - makes external adjustments fast and easy.
- Packing springs - live-load packing to reduce fugitive emissions.
- 2-piece chevron packing offers improved sealing over conventional packing designs.
- Fully supported packing - reduces need for adjustment.

- Pressures to 5000 psig (345 bar)
- Temperatures to 450°F (232°C) with standard PFA packing; up to 600°F (315°C) with optional PEEK packing
- Panel mounting standard
- Metal-to-metal and soft seal stems
- Choice of materials - 316 stainless steel, alloy 400, brass, and plated carbon steel
- Straight, angle, and cross pattern body styles
- Variety of end connections include gageable SWAGelok® Tube Fittings, male NPT, female NPT, and ISO, BSP, DIN and JIS tapered pipe ends
- Orifice sizes of 0.060" ("0" Series), 0.172" ("1" Series), 0.250" ("1" Series), and 0.375" ("18" Series)
- Flow coefficients (C_v) from 0.09 to 1.60
- Every valve is factory tested



TECHNICAL DATA

These ratings are for a standard valve having PFA packing. Optional seal materials will affect the temperature rating. See Stem Packing Seals on Page 4.

VALVE MATERIAL	STEM TYPE	TEMPERATURE RATING	PRESSURE RATING @ 100°F (38°C)
316 Stainless Steel	Metal-to-metal	-65°F to 450°F (-54°C to 232°C)	5000 psig (345 bar)
	Kel-F	-65°F to 200°F (-54°C to 93°C)	
Alloy 400	Metal-to-metal	-65°F to 450°F (-54°C to 232°C)	3000 psig (207 bar)
	Kel-F	-65°F to 200°F (-54°C to 93°C)	
Brass	Metal-to-metal	-65°F to 400°F (-54°C to 204°C)	
	Kel-F	-65°F to 200°F (-54°C to 93°C)	
Plated Carbon Steel	Metal-to-metal	-20°F to 350°F (-29°C to 176°C)	
	Kel-F	-20°F to 200°F (-29°C to 93°C)	

WORKING PRESSURE

ANSI GROUP	2.2		N/A		N/A		3.4			
	MATERIAL NAME CLASS (ANSI)		316SS 2080		Brass N/A		Steel ¹ N/A		Alloy 400 1500	
TEMPERATURE & PRESSURE	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar
-55°F (-54°C) to	100°F (38°C)	5000	345	3000	207	3000	207	3000	207	207
	200°F (93°C)	4295	298	2350	162	2730	198	2640	182	182
	300°F (148°C)	3675	267	2050	141	2680	193	2470	170	170
	350°F (176°C)	3715	258	1470	101	2615	180	2430	167	167
	400°F (204°C)	3580	245	990	67	-	-	2390	168	168
450°F (232°C)	3435	238	-	-	-	-	2380	164	164	164

¹ Consult applicable code book for details at a working pressure of 2000 (207°C). To determine PFA packing psig, multiply psig by 0.99. For consistency references to ANSI Class ratings, refer to Technical Bulletin No. 4.

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Pressure ratings for tubing used with SWAGelok Tube Fitting ended valves are determined by the tubing material and wall thickness. Please see the Tubing Data sheet, located in subsection 5 Technical Information of your Master Product Binder. It contains suggested working pressures for various tubing sizes, materials and wall thicknesses.

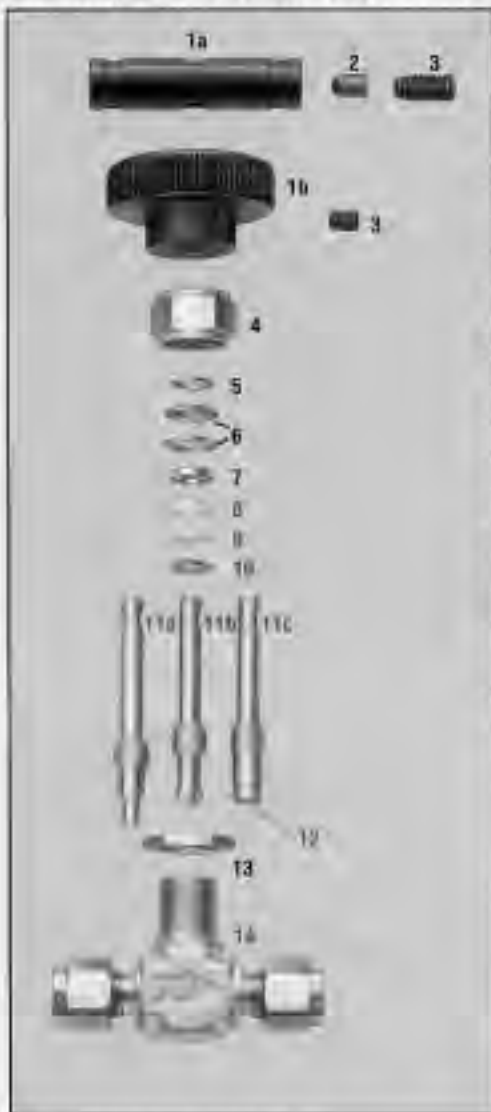


A SWAGelok COMPANY

WHITEY Co.
370 Bishop Rd., Highland Heights, OH 44133 U.S.A.

MATERIALS OF CONSTRUCTION

Knob handles are standard on the "0" and "1" Series Valves. Bar handles are standard on the "18" Series Valves. Optional handles are available on all series. Refer to Page 4 for selection and ordering information.



Wetted parts numbered in red.

Lubrication: Tungsten disulfide and fluorocarbon base.

TESTING

Standard Production Test - Every valve is factory tested @ 1000 psig (68 bar) for leakage at the seats to a maximum allowable leak rate of 0.1 scfm. The packings are tested for no detectable leakage.

Optional Hydrostatic Test - This hydrostatic shell test is performed with deionized water at 1-1/2 times the working pressure.

Other optional tests are available. Consult your Authorized SWAGELOK Sales & Service Representative.

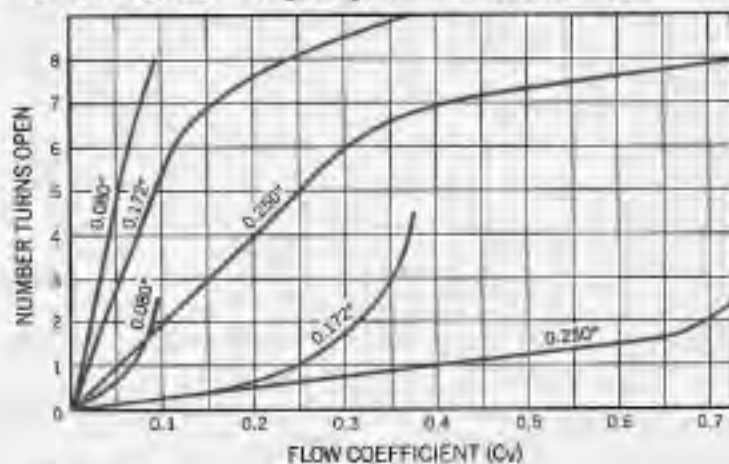
	VALVE BODY MATERIALS			
	316SS	Brass	Steel	Alloy 400
	GRADE/ASTM SPECIFICATION			
1a Bar Handle	Aluminum			
1b Knob Handle	Phenolic			
2 Handle Pin	Steel			
3 Set Screw				
4 Packing Nut	316SS/A276	Brass 360/B16	12L14/A105	Alloy R-405/B164
5 Gland ²	Stainless Steel			
6 Packing Springs ²	17-7PH/A893			
7 Packing Gland	316SS/A276, A167, 8793			
8 Upper Packing	PFA			
9 Lower Packing				
10 Lower Gland	316SS/A167			Alloy 400/B127
11a Regulating Stem	316SS/A276			Alloy R-405/B164
11b Vee Stem				
11c Soft Seat Stem				
12 Stem Tip (Soft Seat)	Kev-F (CTFE)			
13 Panel Nut	Stainless Steel	Brass 360/B16	Stainless Steel	
14 Body	316SS/A162	Brass 377/B283	11L17/A108	Alloy 400/B584

² Utilized in valves with the following orifice size: 0.080 and 0.172 in. (2.0 and 4.4 mm).

³ Number of springs will vary depending on valve series.

FLOW COEFFICIENT (C_v) @ TURNS OPEN

"0" & "1" Series ■ Regulating Stem ■ Vee or Kev-F Stem



"18" Series

