SINGER VALVE
Result-Based Solutions. Globally.

12850-87th Avenue
Surrey, BC. Canada. V3W 3H9
Ph: 604-594-5404
Fx: 604-594-8845
www.singervalve.com

SINGER MODEL 106/206-PGM

Power Operated Globe Valve with Integral Back-up Operator

Sizes 3" to 8" (106-PGM) 4" to 10" (206-PGM) Drawing A0749F

Installation, Operating and Maintenance Instructions

DESCRIPTION:

This valve is a variation of the basic valve (106/206-PG) used as the main valve for most automatic control valves. The integral, secondary operating chamber can operate the primary valve, using a separate and independent pilot system.

OPERATION:

The primary valve [everything below adapter (48)] is normally open when a pressure of 5 PSI or greater is applied to the inlet and the bonnet is vented to the atmosphere. When the inlet pressure is directed to the bonnet [above the lower diaphragm (20)], the valve closes because the area of the diaphragm is greater than the area of the seat.

By varying the pressure in the bonnet with a SINGER Automatic Pilot Circuit the primary valve can be made to open, close or modulate. This varies the flow to suit any particular service such as pressure reduction, relief, level control, etc.

In some cases the line media is unsuitable (viscous, dirty, etc.) for control. Under these conditions it will be necessary to use external water pressure for controlling. External pressure must be equal to, or greater than maximum line pressure.

The secondary operating chamber and pilot system is operated by the Upper Diaphragm (21) Assembly. The bottom side of Upper Diaphragm (21) is at atmospheric pressure (vented through ***port "c"***). Connecting the inlet pressure of the valve above this diaphragm produces a high closing force, which will close the primary valve under most circumstances. This high and positive closing force is used for various functions, most often as a back-up for component failure or a requirement for fast closing. Unless otherwise specified, the valve will be assembled for service temperatures to 180°F (80°C).

STORAGE:

This valve must be stored indoors, away from direct sunlight.

INSTALLATION:

Use washers under nuts when bolting valve flanges to pipe flanges to protect the Epoxy Coating.

1. **This valve must be installed in a horizontal line with the bonnet up.**
2. **It is possible that diaphragms may take a set after shipping and storage. It is highly recommended that Bonnet and Body Bolts or Nuts be tightened after installation but before pressurizing the valve. If a leak develops after pressurizing, de-pressurize the valve and tighten the bolts or nuts.**
3. For most convenient operation and maintenance, manual shut off valves should be installed, in the mainline, upstream and downstream of the Singer PGM valve.

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INSTALLATION (Cont.):

4. A suitable bypass should be provided to allow for servicing of the valve without interrupting the flow.
5. Install pressure gauges upstream and/or downstream of valve as appropriate. This will facilitate setting of the pilot system(s).
6. A strainer with a suitable basket should be installed ahead of the valve to protect it from foreign material.
7. Sufficient space should be provided around the valve for disassembly.
8. Flush system of all foreign matter before installing the valve.
9. Check direction of flow (inlet of valve is marked OR an arrow on the side of body indicates flow direction) and install the valve accordingly.
10. Bleed air from the bonnet. Use bleed screw (63).

SERVICE SUGGESTIONS:

FAILS TO OPEN

1. Insufficient inlet pressure. - Increase pressure
2. Pressure in the bonnet is not released:

- Isolating valves on pilot lines closed. - Open valves
- Pilot components not functioning. - Refer to specific instructions on pilot components
- Foreign material in pilot system. - Clear obstruction

FAILS TO CLOSE

Lack of pressure in bonnet due to:

- Pilot components not functioning. - Refer to specific instructions on pilot components.
- Foreign material in pilot system. - Clear obstructions.
- Ruptured diaphragm. - Replace worn parts.
- Obstruction in the valve. - Remove obstructions.
- Worn main valve disc. - Replace disc.

PULSATIONS

1. Air in the bonnet. - Vent air.
2. Improper adjustment of pilot components. - Refer to specific instructions on pilot components
3. Valve oversized (improper sizing if valve operates on wide range of flow rates. - Install a smaller valve in parallel to handle low flow rates.

MAINTENANCE:

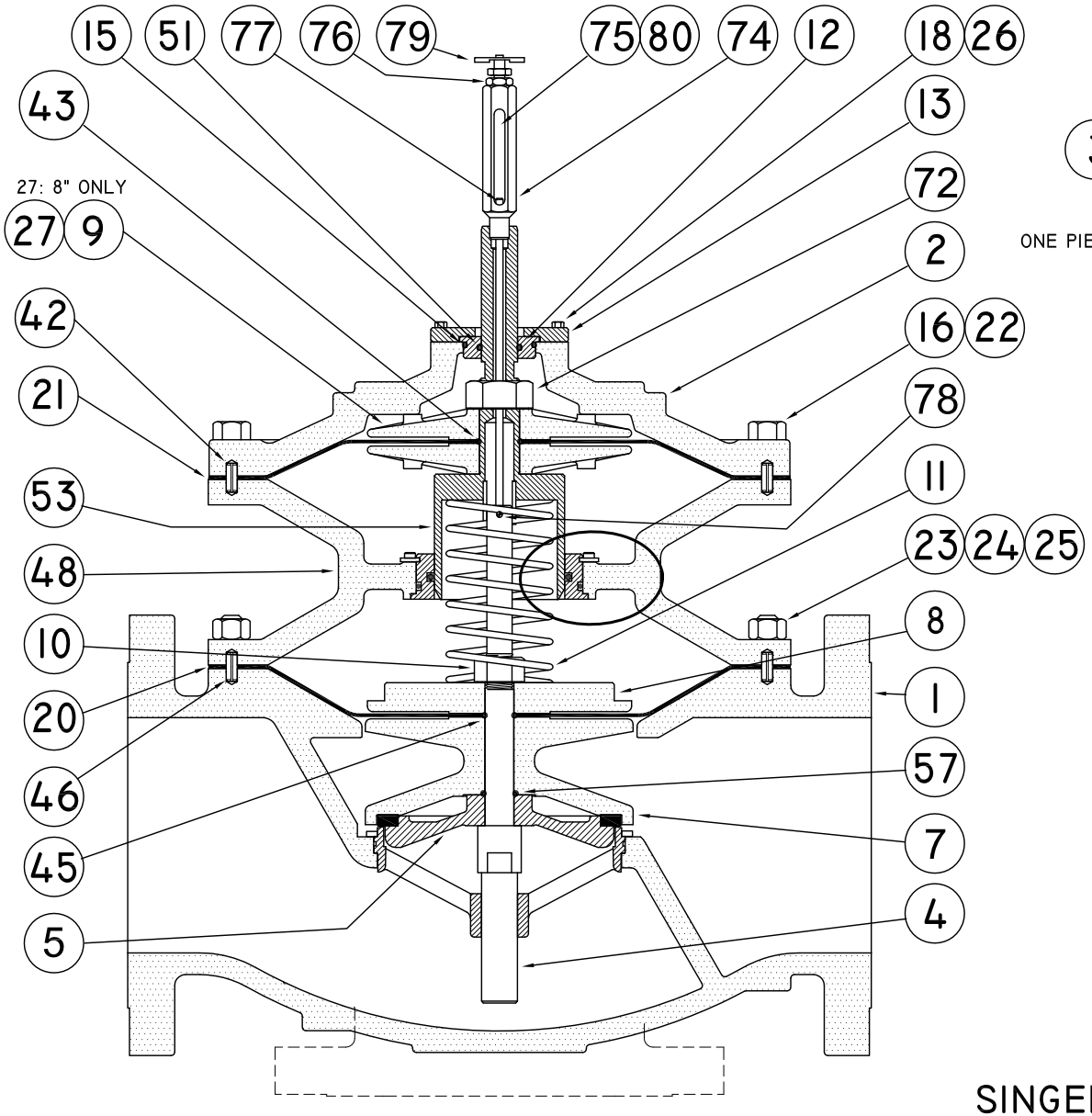
The SINGER Model 106/206-PGM requires a minimum of maintenance. All parts are accessible for inspection and repair without removing the valve from the line.

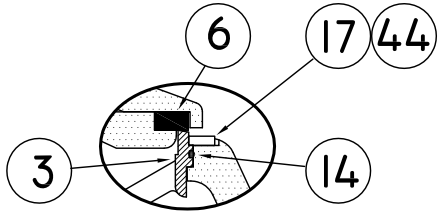
1. Close upstream and downstream isolating gate valves.
2. Disconnect all pilot lines.
3. If valve is equipped with position indicator, limit switch or position transmitter, remove any parts that prevent removal of the secondary operator assembly.
4. Remove lower body capscrews (16B) or nuts and remove the secondary operating chamber (all parts above # 48) as an assembly.

NOTE REGARDING FREEZING:

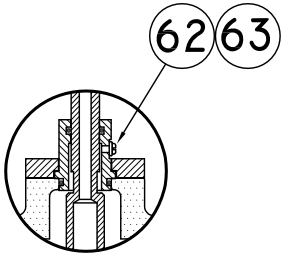
This valve does not drain completely when inlet and outlet pipes are drained. Where freezing conditions are expected, one of the following must be performed:

1. Drain valve and pilot system completely.
2. Provide insulation and/or heating to keep the valve from freezing.

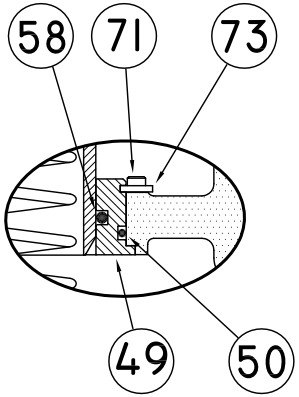




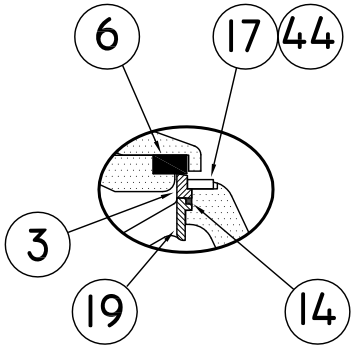
ONE PIECE SEAT & BOTTOM GUIDE DETAILS



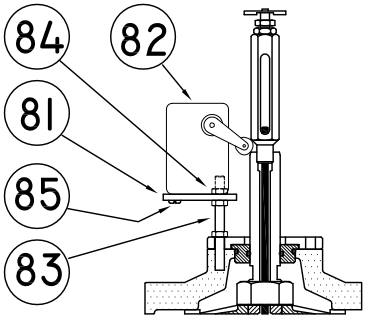
3" & 4" 106 PGM UPPER GUIDE DETAIL



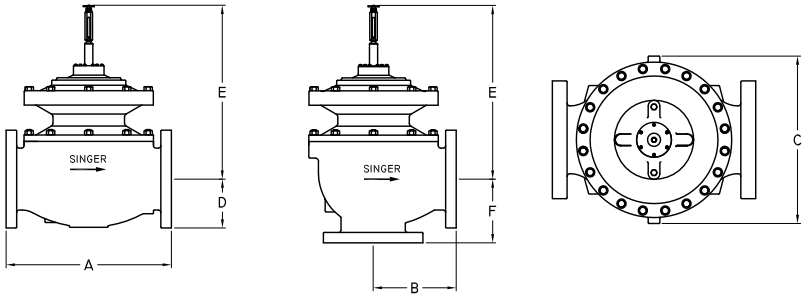
ADAPTOR BUSHING DETAILS



TWO PIECE SEAT & BOTTOM GUIDE DETAILS



OPTIONAL LIMIT SWITCH



SINGER MODEL 106 / 206-PGM

POWER OPERATED GLOBE VALVE
WITH INTEGRAL BACK UP

3" TO 8" 106-PGM & A106-PGM
4" TO 10" 206 PGM
4" TO 8" A206 PGM

A0749F

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Material Specifications & Dimensions

3" - 8" (80mm - 200mm) 106-PGM & A106-PGM; 4" - 10" (100mm - 250mm) 206-PGM; 4" - 8" (100mm - 200mm) A206-PGM

For Drawing A0749F

Item	Part	Material		Item	Part	Material
1	Body	Ductile Iron		**45 ****	**Lower Diaph. Seal**	**Buna-N**
2	Bonnet	Ductile Iron		46	Body Locating Pin	Steel
3	Seat Ring	Stainless Steel		48	Adaptor	Ductile Iron
4	Stem	Stainless Steel		49	Adaptor Bushing	Brass
5	Disc Retainer	Bronze or Ductile Iron		**50 ****	**Adapter Seal**	**Buna-N**
6 **	**Resilient Disc**	**EPDM or Buna-N**		**51 ****	**Upper Guide Seal**	**Buna-N**
7	Inner Valve	Ductile Iron		53	Upper Stem	Stainless Steel
8	PG Clamp Plate	Ductile Iron		**57 ****	**Inner Valve Seal**	**Buna-N**
9	PGM Clamp Plate (2)	Ductile Iron		**58 ****	**Adaptor Stem Seal**	**Buna-N**
10	Stem Nut	Brass		62	Bleed Seal	SST & Buna-N
11	Spring	Stainless Steel		63	Bleed Screw	Stainless Steel
12	Guide Bushing	Brass		71	Adapter Bushing Screw	Stainless Steel
13	Bonnet Plate	Steel		72	Upper Stem Nut	Brass
14 **	**Seat Ring Seal**	**Buna-N**		73	Retaining Ring	Stainless Steel
15 **	**Bushing Seal**	**Buna-N**		74	Indicator Body	Brass
16	Bonnet Bolts	Stainless Steel		75	Sight Tube	Glass
17	Seat Ring Screws	Stainless Steel		76	Indicator Cap	Brass
18	Bonnet Plate Screw	Stainless Steel		77	Indicator Stem	Stainless Steel
19	Bottom Guide	Ductile Iron		78	Retaining Pin	Stainless Steel
20 **	**Lower Diaphragm**	**EPDM**		79	Bleed Valve	Brass
21 **	**Upper Diaphragm**	**EPDM**		**80**	**Sight Tube Gasket (2)**	**Buna-N**
22	Bonnet Washers	Stainless Steel				
23	Body Studs	Stainless Steel			**OPTIONAL Limit Switch:**	
24	Body Nuts	Stainless Steel		81	Bracket	Brass
25	Body Washers	Stainless Steel		82	Limit Switch	
26	Bonnet Plate Washers			83	Support Rod	Stainless Steel
27	PGM Middle Clamp Plate	Ductile Iron	(8" only)	84	Support Rod Nuts	Stainless Steel
42	Bonnet Locating Pin	Steel		85	Mounting Screw	Stainless Steel
43 **	**Upper Diaph. Seal**	**Buna-N**				
44	Seat Retaining Washer	Stainless Steel				

** Recommended spare parts (included in Rebuild Kit)

106-PGM & A106-PGM		Globe			Globe & Ang	Angle		
		A	D	E	C	B	E	F
3"	**NPT / BSPT**	13.50"	3.68"	17.63"	9.25"	6.63"	17.63"	4.63"
80mm		343mm	93mm	448mm	235mm	168mm	448mm	118mm
	150F	12"	3.75"	17.63"	9.25"	6.06"	17.63"	4.06"
		305mm	95mm	448mm	235mm	154mm	448mm	103mm
	300F	13.25"	4.13"	17.63"	9.25"	6.43"	17.63"	4.43"
		337mm	105mm	448mm	235mm	163mm	448mm	113mm
	PN10, PN16 PN25, PN40	318mm	100mm	448mm	235mm	163mm	448mm	113mm
4"	**150F / PN10, PN16,**	15"	4.60"	19.43"	10.88"	7.50"	19.13"	5"
100mm	**PN25, PN40**	381mm	117mm	494mm	276mm	191mm	486mm	127mm
	300F	15.63"	5.09"	19.43"	10.88"	7.88"	19.13"	5.31"
		397mm	129mm	494mm	276mm	200mm	486mm	135mm
6"	**150F / PN10, PN16**	20"	5.60"	21"	16.75"	10"	20.63"	6"
150mm		508mm	142mm	533mm	425mm	254mm	524mm	152mm
	300F / PN25, PN40	21"	6.34"	21"	16.75"	10.50"	20.63"	6.50"
		533mm	161mm	533mm	425mm	267mm	524mm	165mm
8"	**150F / PN10, PN16**	25.38"	7.88"	26.88"	21.63"	12.75"	27.38"	8"
200mm		645mm	200mm	683mm	549mm	324mm	695mm	203mm
	300F / PN25, PN40	26.38"	7.88"	26.88"	21.63"	13.25"	27.38"	8.50"
		670mm	200mm	683mm	549mm	337mm	695mm	216mm

206-PGM & A206-PGM		Globe			Globe & Ang	Angle		
		A	D	E	C	B	E	F
4"	**150F / PN10, PN16,**	15"	4.60"	19.13"	10"	7.56"	17.38"	5.94"
100mm	**PN25, PN40**	381mm	117mm	486mm	254mm	192mm	441mm	151mm
	300F	15.63"	5"	19.13"	10"	7.88"	17.38"	6.25"
		397mm	127mm	486mm	254mm	200mm	441mm	159mm
6"	**150F / PN10, PN16**	20.13"	5.60"	20.88"	12.50"	10.19"	19.25"	6.19"
150mm		511mm	143mm	530mm	318mm	259mm	489mm	157mm
	300F / PN25, PN40	21"	6.25"	20.88"	12.50"	10.63"	19.25"	6.81"
		533mm	161mm	530mm	318mm	270mm	489mm	173mm
8"	**150F / PN10, PN16**	25"	6.75"	23.38"	16"	12.50"	20.50"	9"
200mm		635mm	171mm	594mm	406mm	318mm	521mm	229mm
	300F / PN25, PN40	26"	7.50"	23.38"	16"	13"	20.50"	9.50"
		660mm	191mm	594mm	406mm	330mm	521mm	241mm
10"	**150F / PN10, PN16**	24.50"	8"	30.63"	20"	-	-	-
250mm		622mm	203mm	778mm	508mm			
	300F / PN25, PN40	25.88"	8.63"	30.63"	20"	-	-	-
		657mm	219mm	778mm	508mm			

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SINGER MODEL S106/S206-PGM

Power Operated Globe Valve with Integrated Back-up Operating System
Sizes 10" to 16" S106, 12" to 24" S206 Drawing A0892B
Installation, Operating and Maintenance Instructions

DESCRIPTION:

This valve is a variation of the basic valve (S106/S206-PG) used as the main valve for most automatic control valves. The integral, secondary operating chamber can operate the primary valve, using a separate and independent pilot system.

OPERATION:

The primary valve [everything below Adaptor (3)] is normally open when a pressure of 5 PSI or greater is applied to the inlet and the bonnet [above diaphragm (18)] is vented to the atmosphere. When the inlet pressure is directed to the bonnet [above Lower Diaphragm (18)], the valve closes because the area of the diaphragm is greater than the area of the seat.

By varying the pressure in the bonnet with a SINGER Automatic Pilot System, the primary valve can be made to open, close or modulate. This varies the flow to suit any particular service such as pressure reduction, relief, level control, etc.

In some cases the line media is unsuitable (viscous, dirty, etc.) for control. Under these conditions it will be necessary to use external water pressure for controlling. External pressure must be equal to, or greater than maximum line pressure.

The secondary operating chamber and pilot system is operated by Upper Diaphragm (17). The bottom side of Upper Diaphragm (17) is at atmospheric pressure. Connecting the inlet pressure of the valve above Upper Diaphragm (17) produces a high closing force, which will close the primary valve under most circumstances. This high and positive closing force is used for various functions, most often as a back up for component failure or a requirement for fast closing.

Unless otherwise specified, the valve will be assembled for service temperatures to 180°F (80°C).

INSTALLATION:

1. **This valve must be installed in a horizontal line with the stem vertical.**
2. **It is possible that diaphragms may take a set after shipping and storage. It is highly recommended that Bonnet and Body Bolts or Nuts be tightened after installation but before pressurizing the valve. Torque to 200 lb-ft (270 N-m). If a leak develops after pressurizing, de-pressurize the valve and tighten the bolts or nuts.**
3. For most convenient operation and maintenance, manual shut off valves should be installed, in the mainline, upstream and downstream of the Singer PGM valve.

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Installation (Cont.):

4. A suitable bypass should be provided to allow for servicing of the valve without interrupting the flow.
5. Install pressure gauges upstream and/or downstream of valve as appropriate. This will facilitate ease of setting the pilot system.
6. A strainer with a suitable basket should be installed ahead of the valve to protect it from foreign material.
6. Sufficient space should be provided around the valve for disassembly.
7. Flush system of all foreign matter before installing the valve.
8. Check direction of flow (inlet of valve is marked OR an arrow on the side of body indicates flow direction) and install the valve accordingly.
9. Bleed air from the bonnet. Use Bleed Valve (53,76).

SERVICE SUGGESTIONS:

FAILS TO OPEN

1. Insufficient inlet pressure. Increase pressure.
2. Pressure in the bonnet is not released:

- Isolating valves on pilot lines closed. Open valves
- Pilot components not functioning. Refer to specific instructions on pilot components
- Foreign material in pilot system. Clear obstruction

FAILS TO CLOSE

Lack of pressure in bonnet due to:

- Pilot components not functioning. Refer to specific instructions on pilot components
- Foreign material in pilot system. Clear obstructions
- Ruptured diaphragm. Replace worn parts
- Obstruction in the valve. Remove obstructions
- Worn main valve disc. Replace disc

PULSATIONS

1. Air in the bonnet. Vent air.
2. Improper adjustment to pilot components. Refer to specific instructions on pilot components.
3. Valve over sized (improper sizing if valve operates on wide range of flow rates. Install a smaller valve in parallel to handle low flow rates.

MAINTENANCE:

The SINGER Model S106/S206-PGM requires a minimum of maintenance. All parts are accessible for inspection and repair without removing the valve from the line.

1. Close upstream and downstream isolating gate valves.
2. Disconnect all pilot lines.
3. If valve is equipped with position indicator, limit switch or position transmitter, remove any parts that prevent removal of the secondary operator assembly.
4. Refer to Drawing A0892B and A0917A.

NOTE REGARDING FREEZING:

This valve does not drain completely when inlet and outlet pipes are drained. Where freezing conditions are expected, one of the following must be performed:

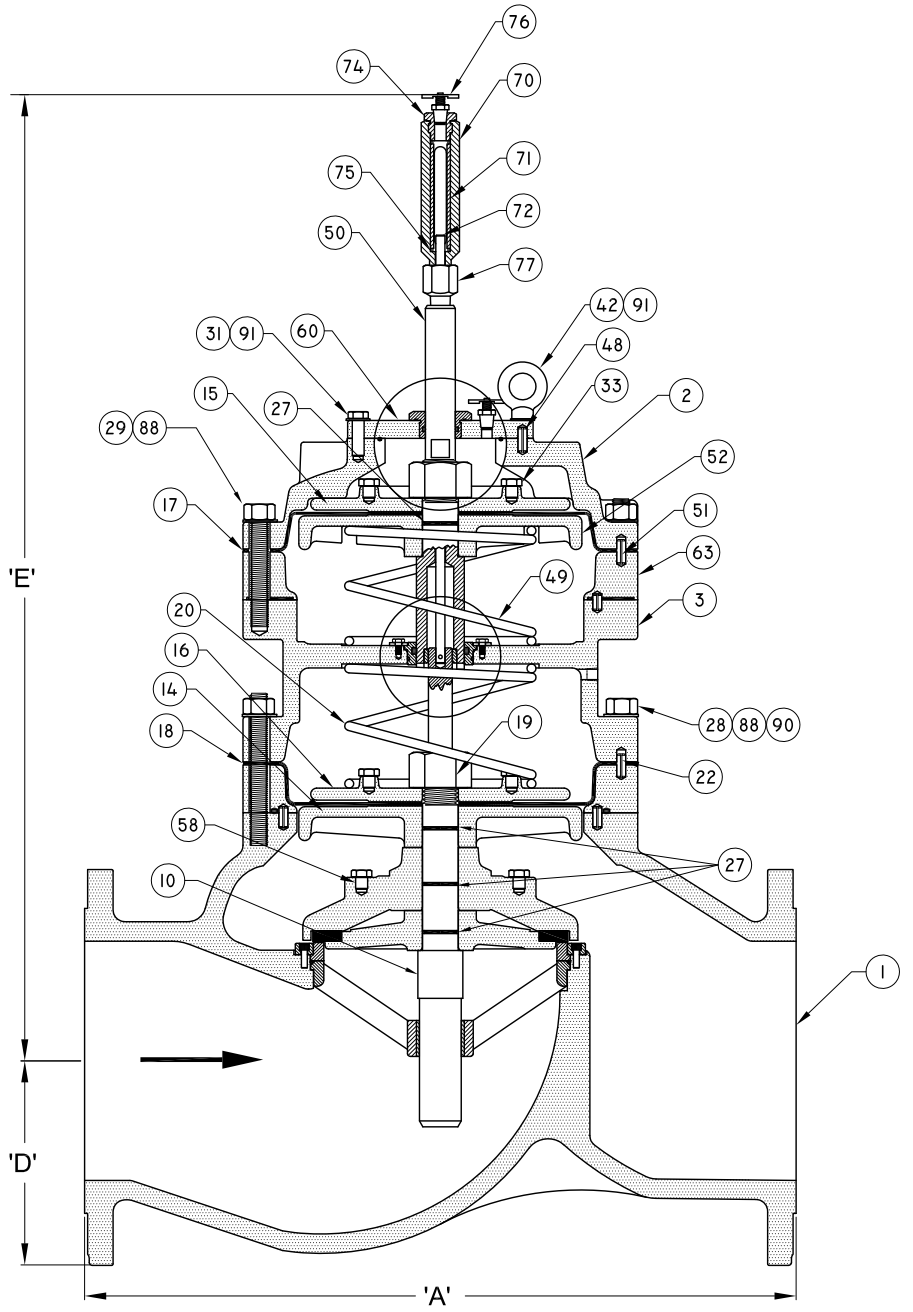
1. Drain valve and pilot system completely.
2. Provide insulation and/or heating to keep the valve from freezing.

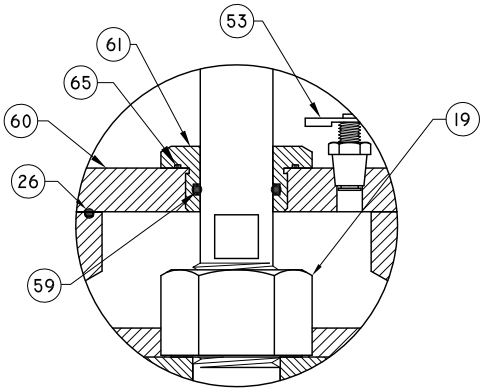
A0892B

SINGER SI06/S206 PGM MAIN VALVE

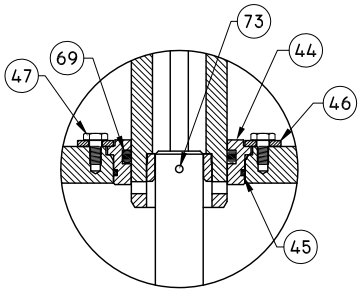
MODEL SI06-PGM : 10" TO 16" GLOBE AND ANGLE STYLE FULL PORT MAIN VALVE

MODEL S206-PGM : 12" TO 24" GLOBE STYLE REDUCED PORT MAIN VALVE

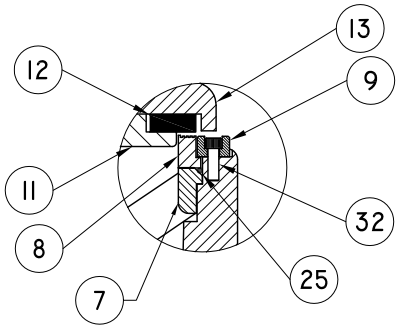




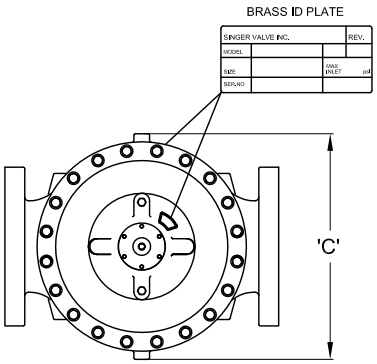
UPPER GUIDE DETAIL

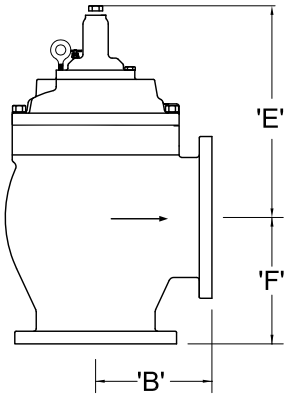


ADAPTOR BUSHING DETAIL



SEAT RING DETAIL





ANGLE CONFIGURATION

SINGER VALVE

FOR PARTS AND SERVICE PLEASE QUOTE SERIAL NUMBER ON BRASS ID PLATE
STANDARD MAIN VALVE ASSEMLY SUBJECT TO CHANGE WITHOUT NOTICE
12850 - 87th Avenue Surrey BC Canada. V3W 3H9
Phone: 604-594-5404 Fax: 604-594-8845
Website www.singervalve.com Email singer@singervalve.com

A0892B

Singer Model S106-PGM, SA106-PGM & S206-PGM — Sizes: 10” to 16” S106
Full Port and Reduced Port Globe and Angle Style Main Valves — 12” to 24” S206
Material Specification for Drawing A0892B

ITEM	PART	MATERIAL
1	Body	Ductile Iron
2	Bonnet	Ductile Iron
3	PGM Adaptor	Ductile Iron
7	Bottom Guide	Ductile Iron &Bronze
8	Seat Ring	Stainless Steel
9	Seat Ring Washer	Stainless Steel
10	Main Stem	Stainless Steel
11	Disc Retainer	Ductile Iron
12 **	**Resilient Disc**	**EPDM**
13	Inner Valve	Ductile Iron
14	Piston	Ductile Iron
15	Clamp Plate	Ductile Iron
16	Clamp Plate	Ductile Iron
17**	**Diaphragm**	**Buna-N**
18**	**Diaphragm**	**Buna-N**
19	Stem Nut	Stainless Steel
20	Lower Spring	Stainless Steel
22	Adaptor Locating Pins	Steel
25 **	**Seat Ring Seal**	**Buna-N**
26 **	**Bonnet Plate Seal**	**Buna-N**
27**	**Stem Seal**	**Buna-N**
28/88/90	Body Stud/Washer/Nut	Stainless Steel
29/88	Bonnet Bolt/Washer	Stainless Steel
31/91	Bonnet Plate Screw/Washer	Stainless Steel
32	Seat Ring Screws	Stainless Steel
33	Clamp Plate Plugs	Stainless Steel
42	Eye Bolt	Steel
44	Adaptor Bushing	Delrin
45**	**Adaptor Bushing Seal**	**Buna-N**
46	Bushing Washer	Stainless Steel
47	Bushing Retaining Screw	Stainless Steel
48	Bonnet Plate Locating Pins	Steel
49	Upper Spring	Stainless Steel
50	Upper Stem	Stainless Steel
51	Bonnet Locating Pins	Steel
52	Upper Piston	Ductile Iron
53	Bleed Valve	Brass
58	Inner Valve Plug	Stainless Steel
59**	**Bonnet Plate Stem Seal**	**Buna-N**
60	Bonnet Plate	Ductile Iron
61	Bonnet Plate Bushing	Brass Brass
65**	**Bonnet Plate Bushing Seal**	**Buna-N**
69**	**Adaptor Stem Seal**	**Buna –N**
70	Indicator Body	Brass
71	Sight Tube	Pyrex Glass
72	Indicator Stem	Stainless Steel
73	Retaining Pin	Stainless Steel
74	Indicator Cap	Brass
75**	**Sight Tube Gasket**	**Buna-N**
76	Bleed Valve	Brass
77	Indicator Adaptor	Brass

** Recommended spare parts included in the Rebuild Kit.

DIMENSIONS – All sizes in inches. Please consult the factory for S106-PGM-AC (ANTI-CAVITATION TRIM) dimensions.

Model S106-PGM, SA106-PGM

SIZE	A	B	C	D	E	F
10”						
150 ANSI	29-3/4	11-1/2	22-1/8	8-9/16	40	12-1/2
300 ANSI	31-1/8	12-3/16	22-1/8	9-5/16	40	13-3/16
12”						
150 ANSI	34	13-3/4	26	9-1/2	44-5/8	12-1/2
300 ANSI	35-1/2	14-1/2	26	10-1/4	44-5/8	13-1/4
14”						
150 ANSI	31	N/A	26	10-1/2	44-5/8	N/A
300 ANSI	32-1/2	N/A	26	11-1/2	44-5/8	N/A
16”						
150 ANSI	41-3/8	18	32	11-3/4	52-7/8	15-11/16
300 ANSI	43-1/2	18-13/16	32	12-3/4	52-7/8	16-1/2

Model S206-PGM

12”	A	C	D	E
150 ANSI	27-1/2	22-1/8	9-1/2	40
300 ANSI	29	22-1/8	10-1/4	40
16”				
150 ANSI	36	26	11-3/4	44-5/8
300 ANSI	37-5/8	26	12-3/4	44-5/8
18”				
150 ANSI	42	30-5/16	12-1/2	52-7/8
300 ANSI	43-5/8	30-5/16	14	52-7/8
20”				
150 ANSI	45	30-5/16	13-3/4	52-7/8
300 ANSI	46-5/8	30-5/16	15-1/4	52-7/8
24”				
150 ANSI	50-1/2	30-5/16	16-1/2	52-7/8
300 ANSI	52-1/4	30-5/16	18	52-7/8

Cv

Model 106

10”	12”	14”	16”
1250	1750	2100	3000

Model 206

12”	16”	18”	20”	24”
1150	2150	3300	3400	3500

October 2004

12850 – 87TH Avenue. Surrey, BC. Canada. V3W 3H9.
Phone: 604-594-5404 Fax: 604-594-8845 www.singervalve.com

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