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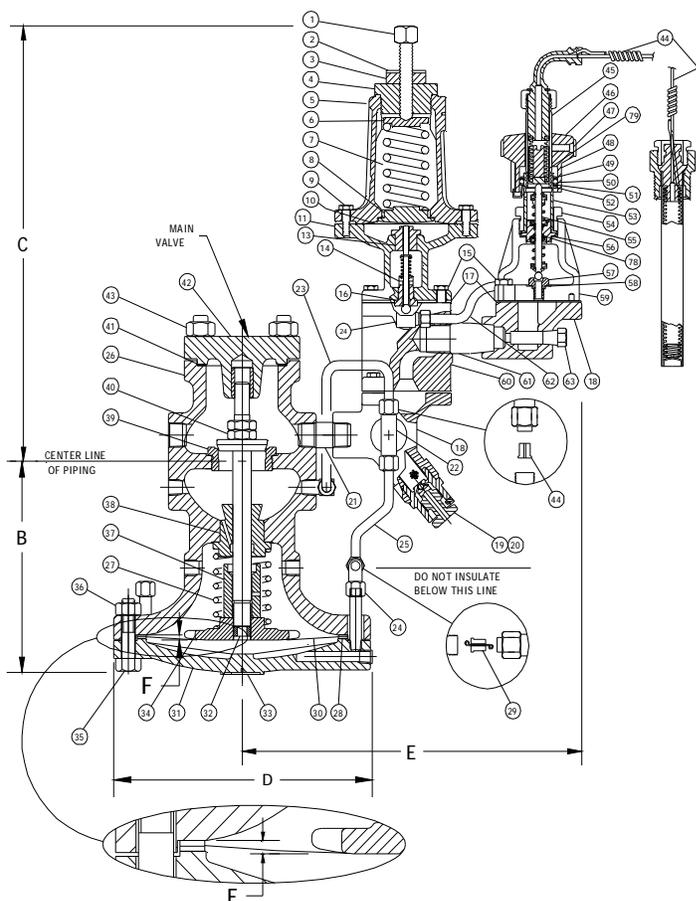
SERIES HDPT & DPT

PRESSURE & TEMPERATURE REGULATING VALVE

INSTALLATION INSTRUCTIONS

INSTRUCTION PART NO. 2244400 C.R.-3388 REV. 7

HDPT VALVE



'HDPT' DIMENSIONAL DATA CHART

SIZE	NPT	FACE TO FACE		B	C*	D	E**	'HD' F	'D' F	WEIGHT-LB	
		150 PSI	300 PSI							NPT	FLG
1/2	4 3/8			5 1/2	14 1/2	6 1/2	10 1/4	.143	.156	18	
3/4	4 3/8			5 1/2	14 1/2	6 1/2	10 1/4	.143	.156	18	
1	5 3/8	5 1/2	6	6 1/4	14 1/2	7	10 1/4	.149	.156	23	35
1 1/4	6 1/2			7 3/8	14 1/2	8 3/4	10 3/4	.175	.125	43	
1 1/2	7 1/4	6 7/8	7 3/8	7 3/8	14 1/2	8 3/4	10 3/4	.175	.140	43	60
2	7 1/2	8 1/2	9	8 1/4	14 1/2	10 7/8	11 1/4	.202	.165	65	85
2 1/2		9 3/8	10	9	14 1/2	11 3/4	11 1/4	.209	.180		105
3		10	10 3/4	8 7/8	14 1/2	13 3/4	12	.237	.230		145
4		11 7/8	12 1/2	10 7/8	14 1/2	14 3/4	13	.237	.292		235
6		15 1/8	16	14 1/8	15	19 3/4	14 1/4	.326	.187		470

PRESSURE PILOT:		
ITEM	PART NAME	MATERIAL
1	Adjusting Screw	Steel
2	Pressure Range Washer	Alum.
3	Lock Nut	Steel
4	Spring Cap	C.R.S. B-1117
5	Pilot Cover	Ductile Iron
6	Upper Spring Plate	H.R.S.
7	Spring	Oil Temp. Stl.
8	Lower Spring Plate Assembly	H.R.S.
9	Cap Screws	Steel
*10	(2) Diaphragms	Phos. Brz.
11	Body, Pilot	Ductile Iron
12		
13	Packing House Bushing	Brass B-16
*14	Head & Seat Ass'y	Stn. Stl.
15	Cap Screw	Steel
*16	Seat Gasket	302 Stn. Stl.
*17	Gasket	Non-Asbestos

TEMPERATURE PILOT:		
ITEM	PART NAME	MATERIAL
44	Thermo System	(Specify Temp. Range)
45	Case Tube	Brass
46	Adjusting Knob	Phenolic
47	Set Screw	Stn. Stl.
48	Retaining Ring	Steel
49	O-Ring	Neoprene
50	O-Ring Retaining Washer	Brass
51	Pointer	Stn. Stl.
52	Body Extension	304 Stn. Stl.
53	Lock Nut	B-16 Brass
54	Head & Guide Assembly	Stn. Stl.
*55	Gasket, Head Guide	Copper
*56	Seat	Stn. Stl.
*57	Seat Gasket	Stn. Stl.
*58	Body, pilot	Ductile Iron
15	Cap Screws	Steel
*17	Gasket	Non-Asbestos
60	Combination Pilot Adapt.	Ductile Iron
61	Nipple	Steel
62	Tubing Adaptor	Copper
63	Pipe Plug	Steel
18	Pilot Adaptor	Ductile

MAIN VALVE:		
ITEM	PART NAME	MATERIAL
18	Pilot Adaptor	Ductile Iron
*19	Blowdown Valve	Stn. Stl.
*20	Screen, 40 Mesh	Stn. Stl.
21	Nipple	Black Pipe, Sch.80
22	Male Branch Tee	Brass
23	Tubing, Pilot to Body	Copper Tubing
24	Elbow, Tube to Pipe	Brass
25	Tubing, Pilot to Diaph.	Copper Tubing
26	Main Valve Body	Ductile Iron
27	Spring	302 Stn. Stl.
*28	Gasket, Diaph. Cover	Grafoil
29	Orifice Ass'y, Diaphragm	Brass (Stn. Stl. Wire)
*30	Diaphragm, Main Valve	Phos. Bronze
31	Diaphragm Cover	Ductile Iron
32	Set Screw	Stn. Stl.
33	Name Plate	Stn. Stl.
34	Diaphragm Plate	C.I. A126 Cl. B
35	Cap Screws	Steel
36	Nuts	Steel
37	Plug Stop	Steel Tubing
38	Stem Guide Ass'y	Brass
*39	Seat Ring	402 Stn. Stl.
*40	Disc & Stem Ass'y	Stn. Stl.
*41	Gasket, Cover	Grafoil
42	Cover Assembly	Ductile Iron
43	Nuts	Steel
44	Bleed Orifice, Male Branch Tee	Brass

Note: The 'D' valve is cast iron instead of ductile iron.

Temperature Adjustment Ranges

Temperature	Identifying Color
60-120°F (16-49°C)	Yellow
100-160°F (38-71°C)	Black
120-180°F (49-82°C)	Blue
160-220°F (71-104°C)	Red
200-260°F (93-127°C)	Green

Pressure Adjustment Ranges

Pressure	Identifying Color
3-25 psi	Yellow
20-100 psi	Blue
80-200 psi	Red

Note: Color code on top of pilot indicates reduced pressure range and color code of spring.

HD Valve Pressure-Temperature Ratings

Screwed Valves	450 PSI @ 650°F
150# Flg. Valves	150 PSI @ 566°F
300# Flg. Valves	450 PSI @ 650°F

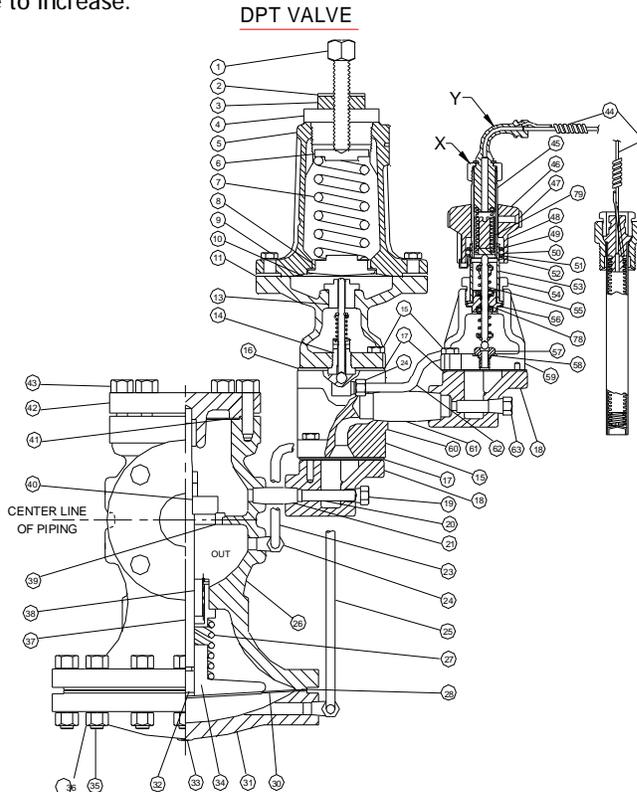
D Design Pressure-Temperature Ratings

Screwed Valves	250 PSI @ 450°F
125# Flg. Valves	125 PSI @ 353°F
250# Flg. Valves	250 PSI @ 450°F

Each Watson McDaniel Company Product is warranted against defects in material and workmanship for one year from date of shipment. This warranty extends to the first retail purchaser only. All defective material must be returned to the person from whom you purchased the Product, transportation prepaid, free of any liens or encumbrances, and if found to be defective will be repaired free of charge or replaced, at the warrantor's or seller's option. If the material is replaced, any replacement will be invoiced in the usual manner and after inspection of alleged defective material an adjustment will be made for depreciation caused by purchaser's use. In no event will Watson McDaniel Company be liable to do more than refund the original contract price. Incidental and consequential damages are excluded, whether under this warranty or otherwise. All implied warranties, including warranties of merchantability and fitness for a particular purpose, are disclaimed and excluded.

PRINCIPLE OF OPERATION

The temperature pilot is operated by a bellows that expands and contracts according to the temperature sensed in the thermostatic bulb. The thermostat is filled with non-compressible fluid that reacts to temperature changes in a linear fashion. Without steam pressure at the regulator inlet the main valve is closed. The temperature pilot is held open by spring force and the pressure pilot is opened by turning the adjustment screw to place some compression on the pilot spring. At start-up, steam entering the regulator passes through both pilot valves to the main valve diaphragm chamber. Flow rate through the pilot seats and diaphragm orifice is greater than that of the bleed orifice; therefore, the steam pressure in the main diaphragm chamber increases. Because the main diaphragm area is greater than the main valve area, the stem disc assembly is forced up thus opening the regulator and admitting steam to the downstream piping at reduced pressure. This pressure is then carried back through a downstream sensing line to the pressure pilot diaphragm providing a balancing force against the pilot spring force which throttles the pilot valve to maintain pressure in the main valve diaphragm chamber so that downstream set pressure is not exceeded. Downstream set pressure can be changed by turning the pilot adjustment screw clockwise to increase and counter clockwise to decrease. As steam flows through the regulator the temperature of the heated medium increases and is sensed by the thermostatic bulb. When temperature approaches the desired set point, the non-compressible liquid in the thermostat expands, causing the connected bellows in the pilot body to increase in length which throttles the pilot valve to maintain pressure in the main diaphragm chamber until the set point temperature is reached. Note: At this point, the downstream pressure could be well below the pressure pilot setting. The temperature pilot has taken over to admit only the required amount of steam pressure to maintain the selected temperature. When the selected set temperature is satisfied, the bellows pushes the pilot valve closed. Then the pressure on the main valve diaphragm evacuates to the outlet side of the regulator through the bleed orifice and the main valve goes closed. Temperature adjustments can be made by turning the temperature adjustment knob on the top of the pilot, clockwise to decrease of counter clockwise to increase.



LIST OF MATERIALS

PRESSURE PILOT:		
ITEM	PART NAME	MATERIAL
1	Adjusting Screw	Steel
2	Pressure Range Washer	Alum.
3	Lock Nut	Steel
4	Spring Cap	C.R.S. B-1117
5	Pilot Cover	Ductile Iron
6	Upper Spring Plate	H.R.S.
7	Spring	Oil Temp. Stl.
8	Lower Spring Plate Assembly	H.R.S.
9	Cap Screws	Steel
*10	(2) Diaphragms	Phos. Brz.
11	Body, Pilot	Ductile Iron
13	Packing House Bushing	Brass B-16
*14	Head & Seat Ass'y	Stn. Stl.
15	Cap Screw	Steel
*16 ¹	Seat Gasket	302 Stn. Stl.
*17 ¹	Gasket	Non-Asbestos

TEMPERATURE PILOT:		
ITEM	PART NAME	MATERIAL
44	Thermo System	(Specify Temp. Range)
45	Case Tube	Brass
46	Adjusting Knob	Phenolic
47	Set Screw	Stn. Stl.
48	Name Plate	Aluminum
49	Retaining Ring	Steel
50	O-Ring	Neoprene
51	O-Ring Retaining Washer	Brass
52	Pointer	Stn. Stl.
53	Body Extension	304 Stn. Stl.
54	Lock Nut	B-16 Brass
*55	Head & Guide Assembly	Stn. Stl.
*56 ¹	Gasket, Head Guide	Copper
*57	Seat	Stn. Stl.
*58 ¹	Seat Gasket	Stn. Stl.
59	Body, pilot	C.I.-A126 CL. B
78	Spring Seal	Teflon
79	Split Tube	Teflon
15	Cap Screw	Steel

PRESSURE/TEMPERATURE ADAPTOR:		
ITEM	PART NAME	MATERIAL
60	Combination Pilot Adaptor	C.I.-A126 CL. B
61	Nipple	Bk. Steel Pipe
62	Tubing Adaptor	Copper
63	Pipe Plug	Steel 1/4" NPT
15	Cap Screw	Steel
*17 ¹	Gasket	Non-Asbestos
18	Pilot Adaptor	C.I.-A126 CL. B
24	Elbow Tube-to-Pipe	Brass

MAIN VALVE:		
ITEM	PART NAME	MATERIAL
18	Pilot Adaptor	C.I. A126 CL. B
*19	Blowdown Valve	Brass B-16
*20	Screen, 40 Mesh	Stn. Stl.
21	Nipple	Black Pipe, Sch.80
22	Male Branch Tee	Brass
23	Tubing, Pilot to Body	Copper Tubing
24	Elbow, Tube to Pipe	Brass
25	Tubing, Pilot to Diaph.	Copper Tubing
26	Main Valve Body	C.I A126 CL. B
27	Spring	302 Stn. Stl.
*28 ¹	Gasket, Diaph. Cover	Non-Asbestos
29	Orifice Ass'y, Diaphragm	Brass (Stn. Stl. Wire)
*30	Diaphragm, Main Valve	Phos. Bronze
31	Diaphragm Cover	C.I. A126 CL. B
32	Set Screw	Stn. Stl.
33	Name Plate	Aluminum
34	Diaphragm Plate	C.I. A126 CL. B
35	Cap Screws	Steel
36	Nuts	Steel
37 ²	Plug Stop	Steel Tubing
38	Stem Guide Ass'y	Brass
*39	Seat Ring	402 Stn. Stl.
*40	Disc & Stem Ass'y	Stn. Stl.
*41 ¹	Gasket, Bottom Cover	Non-Asbestos
42 ³	Cover Assembly	C.I. A126 CL. B
43	Cap Screws	Steel

¹ Must use Factory Replacement Parts for these gaskets

² Not used on 1/2, 3/4 & 1" valves

³ Stem not guided in bottom cover on 1/2, 3/4, & 1" valves

*Denotes recommended spare parts

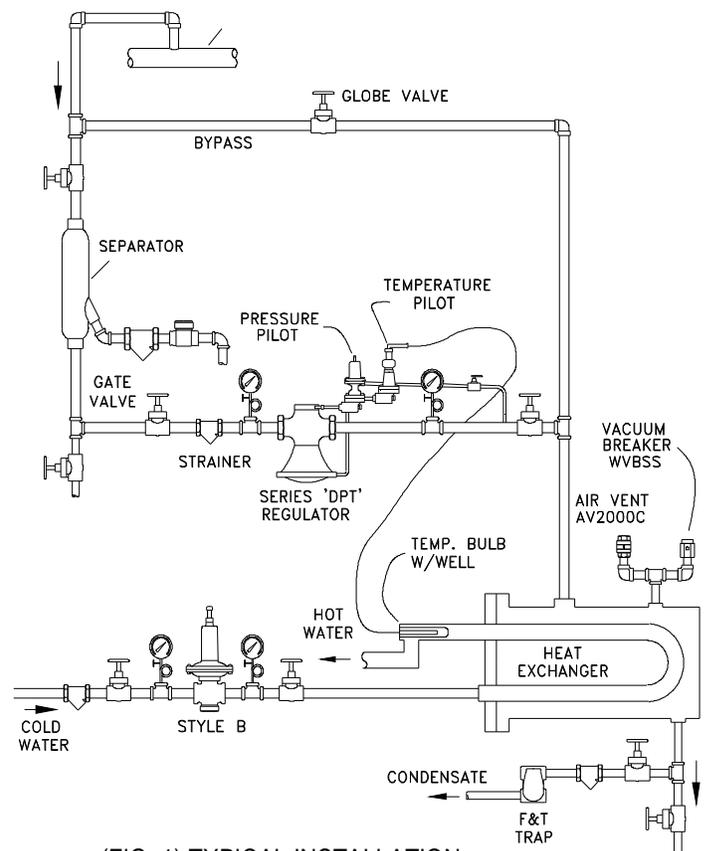
Specify D or HD valve when ordering.

INSTALLATION

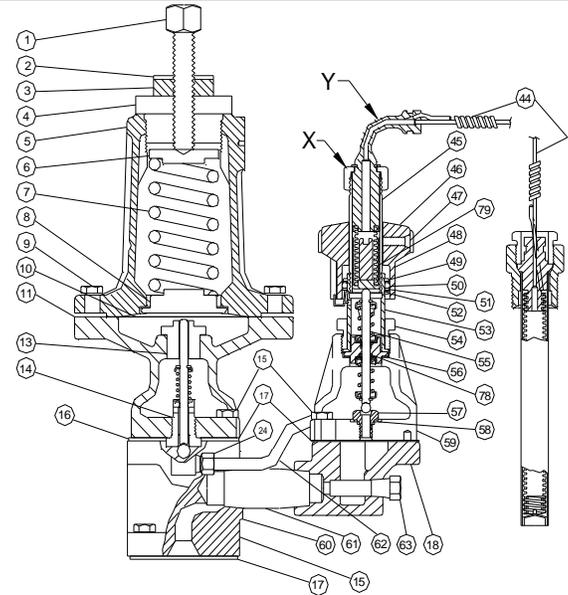
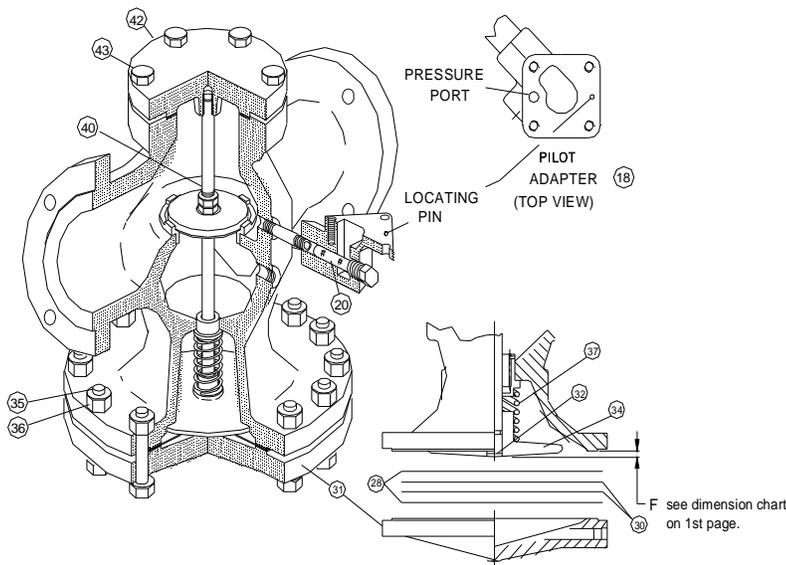
- Piping hookup Fig. 1 is a typical installation to be used as a guide for planning piping.
- Valve must be installed in horizontal position with flow in direction as indicated by arrow on body. Main valve diaphragm to be in down position. (Caution: When installing flanged valves make sure flange bolts are tightened evenly so as not to overstress and crack flanges.)
- Piping on downstream side of valve is generally larger than valve to eliminate flow restriction.
- Line should be blow down thoroughly.
- By-pass connections of same size as pressure reducing valve is recommended. (See Fig. 1.) Use gate valves before and after pressure reducing valve and globe valve as by-pass valve.
- Install a separator with a steam trap ahead of the DT regulator which will remove nearly all the condensate from the steam. This will enhance the operation and service life of both the valve and the equipment downstream.
- A 'Y' type strainer should be installed before the pressure reducing valve. Make sure sufficient clearance is allowed so strainer screen can be removed.
- Assemble Pressure and Temperature Pilots to Main Valve:
 - Remove protector from pilot adapter.
 - Place gasket on pilot adapter making sure roll pin in pilot adapter is inserted through small hole in gasket. (See illustration.)
 - Mount the Combination Pilot Adapter Assemble with (4) hex head bolts, making sure roll pin is inserted in the blind hole of Combination Adapter (60). See front cover for illustration.
 - Place pressure pilot gasket on top of Combo-adapter (60) and mount pressure pilot with (4) bolts. Take care with the roll pin orientation and tighten evenly.
 - Place temperature pilot gasket on remaining pilot adapter and temperature pilot with (4) bolts. Note roll pin orientation and tighten bolts evenly.
- Pilot Line Connections.
 - Pilot sensing line can be 1/4" pipe or 5/16" copper tubing.
 - Sensing line will run from the pilot to the downstream side of pressure reducing valve and tap into the outlet pipe a minimum of ten (10) pipe diameters from the valve. Avoid tapping into an area where there will be a significant amount of turbulence.
 - Important: To keep condensate out of pilot the sensing line must be sloped downward and away from the pilot.
 - When reduced pressure is supplied to a single piece of equipment such as a tank, heater, kettle, etc. the sensing line may be connected directly to the equipment for optimum pressure control.
 - A needle valve should be installed in the pilot sensing line to damper the regulator reaction if desired and for isolation.
 - A pressure gauge should be installed in the sensing line down stream connection. (Use pig-tail and pet-cock.)
 - Provision should be made for removal of sensing line to ease pilot service.
- Connect Thermostatic Bulb to System.
 - Always avoid sharp bends or any kinks in the flexible capillary. Provide support for the capillary tubing to prevent damage, keeping it away from hot surfaces.
 - Install thermostatic bulb in a location that avoids any hot or cold spots in the system. Make sure the entire bulb is exposed to the system fluid.
 - Important: When bulb is installed in a thermal well, a heat transfer compound must be packed into the well to insure a fast transfer of heat from the system to the bulb. High temperature grease is usually used for this purpose.
 - Install a thermometer (verify accuracy) in the system, as close to the thermostatic bulb as possible, for the purpose of setting the system temperature.
 - If the temperature scale on the control knob can not be readily seen, it can be adjusted by loosening Lock Nut (54) and rotating the assembly to the desired position.

START UP

- Make sure all lines have been blown down to remove initial dirt and scale from system.
- Close all valves in installation.
- Turn temperature knob to the desired temperature.
- Loosen locknut (3) on pressure pilot adjusting screw and make sure there is no compression on the adjusting spring.
- Open drain valve at the separator or other upstream drain valve to make sure all condensate is drained from inlet piping. If this is not done, serious damage to the piping system can occur as a result of water hammer.
- After all condensate is removed open needle valve in pilot sensing line.
- Slowly open down stream gate valve. Bypass, if installed, should be closed.
- Open inlet gate valve slowly. Watch for possible water hammer.
- Turn pressure pilot adjusting screw (1) slowly clockwise until valve opens and passes steam. Adjust pilot spring until desired downstream pressure is obtained. CAUTION: A time period may be involved to fill the downstream system with steam before pilot can be finally adjusted for correct pressure setting. After system has stabilized readjust spring setting and tighten locknut (3).
- Allow sufficient time for the system being heated to stabilize, then check system thermometer for the desired temperature. If necessary, turn the adjusting knob up or down a few degrees to reach the system requirement. If, after the system has fully stabilized, the adjusting knob reading does not agree close enough with the thermometer, the knob can be recalibrated by following the Service Instructions.
- Inspect all piping connections and valve for possible leaks and tighten as required. Check and retighten main valve diaphragm bolts.



(FIG. 1) TYPICAL INSTALLATION



MAINTENANCE

It is good practice to periodically inspect and clean the following parts. Frequency of inspection and cleaning are dependent on the condition of the steam system.

1. Blow down or clean all pipe line strainer screens.
2. Inspect and clean pilot screen.
3. Inspect and clean bleed and diaphragm orifice.
4. Check all connections for leakage.

Note: These items should also be checked a few days after valve is initially installed and shortly after each seasonal start-up.

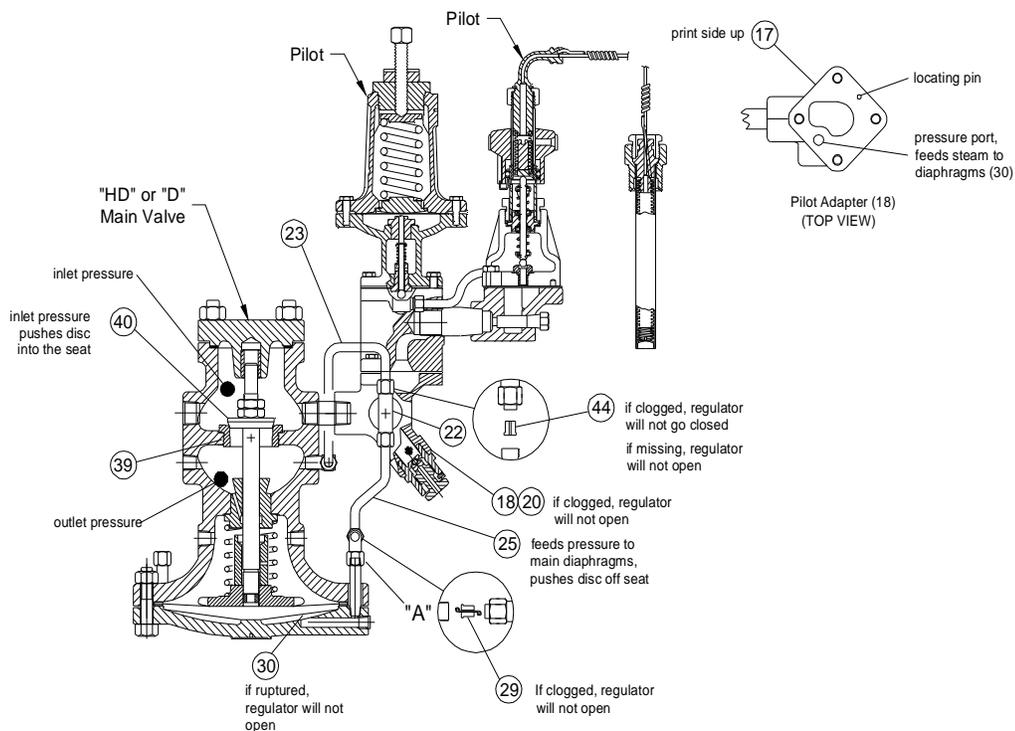
SERVICE INSTRUCTIONS

Caution - Regulator & pilot must be cool before disassembly.

- 1.) Re-calibrate Temperature Scale on Adjusting Knob (46).
 - a) Make sure the thermostatic bulb is completely immersed in the fluid being heated.
 - b) Slowly turn the adjusting knob clockwise until the main valve closes to stop steam flow.
 - c) Slowly turn the adjusting knob counterclockwise until a light flow of steam is noted.
 - d) Use a 3/32" hex wrench to loosen set screw (47) in the adjusting knob, then rotate the adjusting knob so that the temperature on the scale agrees with the thermometer. CAUTION: Do not change the spacing between the bottom of the knob and the pointer. Retighten set screw.
- 2.) Replace Thermal Element Assembly.
 - a) Unscrew the hex nut 'X' from the pilot and remove bellows.
 - b) Install the new thermal element assembly and tighten hex nut 'X'. Caution should be taken to avoid overtightening.
 - c) It is generally not necessary to re-calibrate the adjusting knob since all thermal assemblies within the same temperature range are interchangeable. If required, see section 'A' above.
- 3.) Servicing Temperature Pilot Seat and Disc
 - a) Isolate valve from all sources of pressure making sure there is no back pressure at the outlet.
 - b) The pilot can be serviced while attached to the regulator but for convenience sake it can be removed from the pilot adapter (18).
 - c) Remove Lock Nut (54) and disassemble the temperature adjusting assembly.
 - d) Withdraw the cartridge disc pilot assembly and inspect the disc and stem seals for wear. If worn, replace complete assembly.
- e) Remove pilot seat (57) with 1/2" hex socket. Inspect sealing surface and threads for wear. If worn, replace seat using a new gasket (58).
- f) Before reassembly, it is recommended that the pilot tubing orifices and screen (20) be inspected & cleaned at this time.
- 4.) Servicing Pressure Pilot Seat and Disc Assembly
 - a) Isolate valve from all sources of pressure making sure there is no back pressure at the outlet.
 - b) Loosen tension on pilot adjusting spring (7).
 - c) Remove pilot from the pilot adapter (18) by removing cap screws (15).
 - d) Screw out the head and seat assembly (14) which is on complete cartridge.
 - e) Inspect seat and ball valve. Carefully clean, if any wear or damage is present, replace cartridge.
 - f) Before reinstalling pilot head and seat assembly, inspect packing house bushing (13) for binding of pilot stem or excessive clearance with the stem. Replace if necessary. Apply Teflon pipe sealant to threads and torque to 20 ft-lbs.
- 5.) Servicing Main Valve Diaphragms (30)
 - a) Isolate valve from all sources of pressure making sure there is no back pressure at the outlet.
 - b) Disconnect copper tubing to main valve diaphragm chamber at 'A' (See next page) check diaphragm orifice (29) for dirt, etc. CAUTION: Some hot condensate may leak from line and diaphragm chamber.
 - c) Loosen diaphragm cover nuts (36). CAUTION: Chamber is filled with condensate, which could be hot. First slightly loosen all nuts, then further loosen several nuts on opposite from where you are standing. Pry cover from valve allowing condensate to drain from valve away from you. Gently pry diaphragm loose from body to drain condensate from body of valve.
 - d) Remove all bolts and diaphragm cover (31).
 - e) Inspect the two (2) metal diaphragms for small cracks and wrinkles. Replace if necessary.
 - f) Clean diaphragm, diaphragm plate and gasket surfaces before reassembly.
 - g) make sure diaphragm plate (34) is securely fastened to stem with locking screw (32). Check stroke calibration to dimension "E" illustrated above.
 - h) Valve stem (40) can be checked for proper movement by pushing up on diaphragm plate. CAUTION: Condensate may be in upper portion of body.
 - i) Replace, if necessary, diaphragm gaskets (28).

- j) Center diaphragms and gaskets on cover. Bolts will assist in centering.
- k) Assemble making sure bolts are taken-up evenly. After system is started, recheck bolts for tightness.
- 6.) Servicing Main Valve and Seat.
- Follow disassembly instructions as noted in section (a) above.
 - Loosen poly lock screw at end of stem or, on older valves, loosen diaphragm plate set screw (32) and remove diaphragm plate (34) spring (27) and on sizes 1-1/4" to 6", plug stop (37).
 - Remove bottom cover bolts (43) and bottom cover (42) and gasket (41).
 - Remove stem and disc assembly (40) from valve and inspect disc and seat for wear. Minor wear can be corrected by lapping disc and seat together with 400 grit lapping compound. Inspect the disc and seat for signs of scale or dirt, which could have caused leakage.
- Check for body erosion around seat ring. Check seat ring for possible damage or excessive wear and any signs of scale or dirt which could cause leakage. Replace if necessary. Replacement seats & discs should be lapped together.
 - Place stem and disc assembly (40) back in the body and install bottom cover (42) using a new gasket (41) if necessary. Slide plug stop (37), if applicable, into the stem with the machined end toward disc, then slip the spring (27) over the stem and plug stop. Thread diaphragm plate (34) onto stem and leave loose.
 - Stroke Calibration: With disc firmly against the seat, thread the diaphragm plate up or down on stem until the plate extends beyond the body by dimension 'E' as shown on page 4. Now Lock in place with the locking screw (32).
 - Replace, if necessary, diaphragm gaskets (28). Center diaphragms (30) and gaskets on cover (31). Bolts will assist in centering. Assemble, making sure bolts are taken-up evenly. After system has heated up, check bolts again for tightness.

TROUBLESHOOTING GUIDE FOR SERIES "HD" & "D" REGULATORS



IMPORTANT NOTE:

By far the most common field problem with 'HD' & 'D' valves is that they become saturated with condensate or water. 'HD' & 'D' valves are designed to operate on steam and may perform erratically or fail to operate at all if the valve and/or pilot contain water. You should always make certain all water is drained from the valve and pilot first before trying to trouble shoot a malfunctioning 'HD' & 'D' valve.

REGULATOR WILL NOT COME UP TO PRESSURE OR TEMPERATURE

- Shut off inlet gate valve to regulator and make sure downstream pressure is zero.
- Make sure that the Pilot Gasket (17) is properly oriented on the Pilot Adapter (18); otherwise, the pressure port in the adaptor will be blocked and regulator will not open.
- Check Pilot Strainer (20) for blockage as well as the upstream pipeline strainer.
- Inspect Diaphragm Orifice (29) for blockage and Diaphragms (30) for rupture.
- Check that the Bleed Orifice (44) at the Male Branch Tee (22) is not missing.

**PRESSURE OR TEMPERATURE OVERRIDES SET POINT:
ISOLATE REGULATOR FROM PILOT FOR TESTING**

1. Shut off inlet block valve to regulator and make sure downstream pressure is zero.
2. Adjust the pilot to the closed position. If it is a Pressure pilot, back out the adjustment screw until there is no compression on the spring. If a Temperature pilot, turn the temperature adjusting knob to the lowest setting.
3. Disconnect the pilot tube (25) at the regulator diaphragm which is indicated as point "A" in the illustration above. Also disconnect the smaller pilot tube (23) at the side of the regulator body designated point "B" in the above illustration.
4. Stand clear of the tube connections and open the block valve upstream of the Main Valve only partially to limit the steam pressure to the regulator. Full line pressure is not necessary for this test.

5. Regulator seat test - With the long pilot tube disconnected at point 'A' the regulator should be closed. If there is steam blowing out of the body side connection at point "B", the main valve and seat are leaking and require inspection for debris that is holding the valve off the seat or erosion of the sealing surfaces.
6. Pilot seat test - With the pilot closed there should not be any steam coming out of the long tubing at point "A". If there is steam flow, the pilot is not closing off and must be inspected for debris or seat erosion. Try running the adjustment screw in & out a few times to clear the debris. If that is not successful, the pilot must be cleaned, repaired or replaced.

SYSTEM TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
1. Can not set valve to give high enough downstream pressure or temperature.	a) Valve undersized. b) Downstream piping undersized. c) Pilot adjustments are too low. d) Pilot spring range not correct. e) Isolation valve(s) partially closed. f) Thermostatic bulb is in a hot spot. g) Upstream pipeline strainer blocked. h) Pilot screen clogged. i) Supply pressure too low. j) Diaphragm orifice blocked. k) Bleed orifice installed wrong, eroded or missing. l) Main valve diaphragm failed. m) Main valve flooded with condensate.	a) Check capacity of valve against load requirements. b) Check velocity of steam in piping system. c) Readjust to desired settings. d) Check color code of spring against spring range in literature. e) Open valves. f) Relocate bulb. g) Clean strainer. h) Clean screen. i) Verify and correct as required. j) Check and clean orifice. Do not remove clean-out wire. k) Inspect and check per illustration. l) Replace diaphragms. m) Drain unit & check trap.
2. Downstream pressure or temperature overrides under load conditions.	a) Valve is extremely oversized. b) Bypass valve open. c) Pilot adjustments are too high. d) Thermostatic bulb is in a cold spot. e) Bleed orifice blocked. f) Dirt in pilot seat or stem guide. g) Foreign object lodged between main valve disc and seat. h) Pilot valve diaphragms ruptured. i) Main valve seat thread leaking.	a) Check sizing against service conditions. b) Close valve. c) Readjust to desired settings. d) Relocate bulb. e) Inspect and clean. f) Inspect and clean. g) Inspect and clean. h) Replace pilot diaphragms. i) Check seat ring area for erosion.
3. Valve will not open.	a) Pilot adjustments not made. b) Upstream isolation valve closed. c) Upstream pipeline strainer blocked. d) Pilot screen blocked. e) Pilot valve seat blocked or stem is bound in guide by dirt. f) Pilot adapter gasket installed incorrectly. g) Bleed orifice missing or installed wrong. h) Main valve diaphragms ruptured.	a) Adjust and set. b) Check and open valve. c) Clean strainer. d) Remove and clean. e) Inspect and clean. f) Install gasket correctly per illustration. g) Inspect and check per illustration. h) Replace main valve diaphragms.
4. Valve will not close.	a) Bypass valve open. b) Pilot sensing line not installed. c) Bleed orifice blocked. d) Dirt in pilot seat or stem guide. e) Foreign object lodged between main valve disc and seat.	a) Close valve. b) Install pilot line. c) Inspect and clean. d) Inspect and clean. e) Inspect and clean.