Reduced Pressure Range 3 to 200 psig
Choice of 3 Pilots

DA AIR PILOTED PRESSURE REDUCING VALVE

Applications

The DA Air Pilot can be used for reducing steam pressure in a variety of applications; heating, process lines, makeup systems and general plant use.

- Remotely-controlled from station or panel
- Control pressure setting within ±1 psig
- Choice of 3 overlapping pressure ranges via differently-sized air chambers
- Page TR-320 has information for its use with Model PT Pneumatic Temperature Controllers
- Interchangeable use with all other pilots without modification to the regulator body, eliminating large inventories of regulators and pilots
- No tubing modification required for sizes through $2^1/_2$"
- A longer nipple and modified tubing for adaptation of air pilot to main body for sizes 3", 4" and 6"

Features

- Air chamber assures smooth, trouble-free operation with remote control convenience
- Replaceable cartridge-type pilot seat and disc for quick service
- Main valve seat & disc are stainless steel, hardened to 500 Brinell for durability
- Air-operated pilot insures instant response and very accurate control
- Can be used in most air-operated control valve applications
- Main valve spring not in flow
- Accessible strainer on pilot adaptor

How It Works

DA Regulator
Cutaway view shown

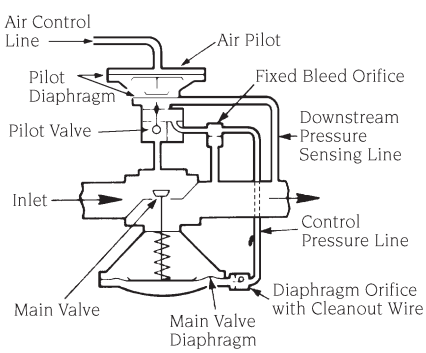
With air pressure through an air pressure regulator to the air pilot and no pressure on the main valve, the pilot valve is open and the main valve closed. When pressure is applied, the high (*or inlet*) pressure is admitted through the pilot valve seat to the high-pressure side of the main valve diaphragm chamber.

Flow rate through the pilot seat and diaphragm orifice is greater than through the bleed orifice. Therefore, the control pressure in the main diaphragm chamber increases. Since the main valve diaphragm has a greater area than the main valve seat, the main valve diaphragm is forced up – opening the main valve and admitting pressure to the reduced (*or downstream*) side of the regulator.

As steam flows through the valve, the downstream pressure increases. This pressure is then carried back through the sensing line to the underside of the pilot diaphragm. When the downstream pressure increases to the point where the force is balanced between the top and bottom of the diaphragm, the pilot valve will throttle and maintain the desired pressure in the main diaphragm chamber by adjusting the flow through the main valve seat and the disc.

When no more steam is required and the set pressure is achieved, the pressure under the pilot diaphragm will increase to the point where the pilot valve closes. The higher pressure in the main valve diaphragm will disperse through the bleed orifice, closing the main valve.

Downstream adjustments are made with an air pressure regulator: increasing air pressure will increase reduced steam pressure; decreasing air pressure will decrease reduced pressure.



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Manufacturers of:
PRESSURE & TEMPERATURE REGULATORS - RELIEF VALVES - STEAM TRAPS - CLEAN STEAM PRODUCTS
LIQUID DRAINERS - PRESSURE PUMPS - EJECTORS - SPECIALTY PRODUCTS

PR-130
(1/01)

DA Air Pilot Specifications

Installation

1. Remove pilot adaptor protector from main valve body.
2. Place gasket in pilot adaptor. Be sure roll pin in adaptor is through small hole in gasket.
3. Assemble pilot to adaptor with roll pin inserted in blind hole of pilot assembly. Tighten bolts evenly.
4. Connect pilot sensing line from pilot valve to side of downstream piping, ten pipe diameters from the main valve body and any valve or fitting downstream from the sensing line connection. Pilot sensing line should be either $^{1}/_{4}$" pipe or $^{5}/_{16}$" O.D. copper tubing.
5. Slope the pilot sensing line downward, away from the pilot valve, to keep condensate out of the pilot.
6. Connect air supply to air chamber from air control station (*max. 30 psig air*). Panel board and control station can be located conveniently away from regulator to make necessary adjustments.
7. If a delivery pressure gauge (*reduced pressure*) is used, it should be connected to the sensing line (*or downstream side*) in an area of minimum turbulence. (*Gauge should be protected with a condensate loop and gauge valve.*)
8. Where reduced pressure is supplied to a single piece of equipment such as a tank, heater, kettle, etc., the pilot sensing line may be connected directly to the point where regulation is desired. The connection point should be the same, as described above in Item 4.
9. A needle valve should be installed in the pilot sensing line so the valve can be isolated for service.
10. A union should be installed near the pilot body so that the pilot can be easily serviced.

Recommended Pressures

Differential between Inlet and Outlet: 10 psig (*min*)
Inlet pressure: 15 psig (*min*)
Reduced Pressure: 5% of inlet pressure for inlet pressures to 100 psig (3 *psig min*), 10% of the inlet pressure, for inlet pressures over 100 psig.
Air Supply Pressure: 3 to 35 psig

How to Order

Specify:
1. Intended use
2. Inlet pressure and temperature (*Maximum*: 250 *psig at* 450°F)
3. Outlet pressure
4. Valve size
5. End connection (*threaded*, 125-*lb flanged*; 250-*lb flanged*)
6. Capacity requirements (*see page on Sizing*)
7. Pilot P/N — Reduced Steam Pressure Range — Approx. Ratio Air-to-Steam

Pilot P/N	Reduced Steam Pressure Range	Approx. Ratio Air-to-Steam
BA-11	3 to 35 psig	1:1
BA-41	3 to 100 psig	4:1
BA-61	20 to 200 psig	6:1

Capacity

See tables on page PR-570-5.

Options

Remote Control Panel Board

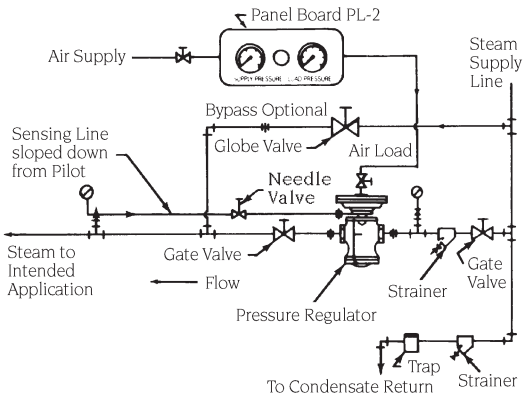
Panel Board PL-1 (*one gauge*)
1. Air Load-to-Pilot

Panel Board PL-2 (*two gauges*)
1. Air Supply
2. Air Load-to-Pilot

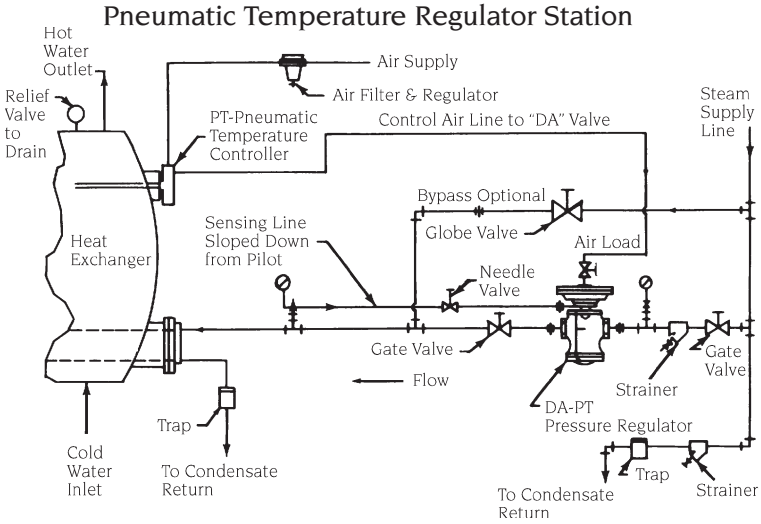
Panel Board PL-3 (*three gauges*)
1. Air Supply
2. Air Load-to-Pilot
3. Delivery Pressure

Typical Applications

Pressure Reducing Station



Pneumatic Temperature Regulator Station

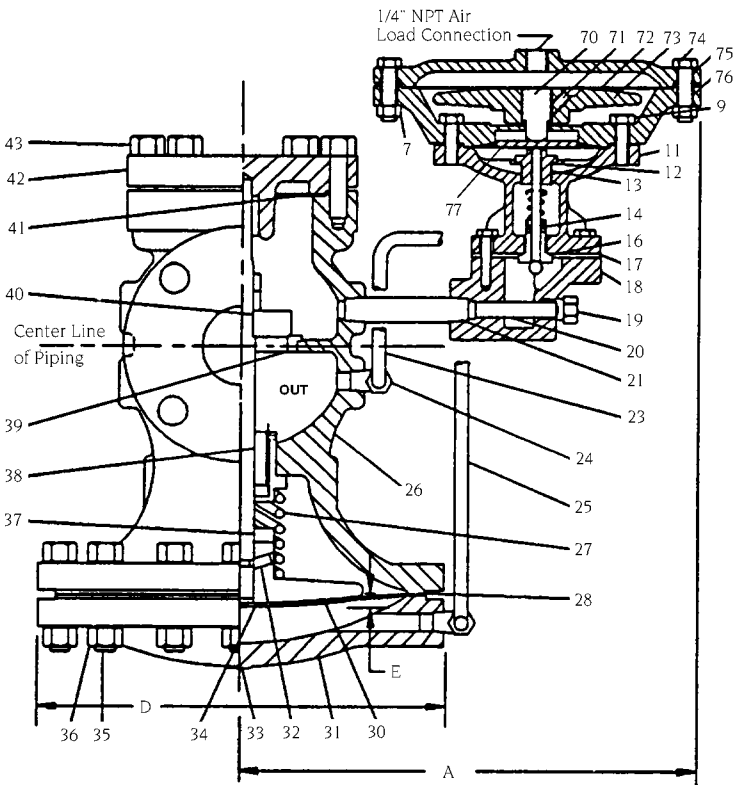


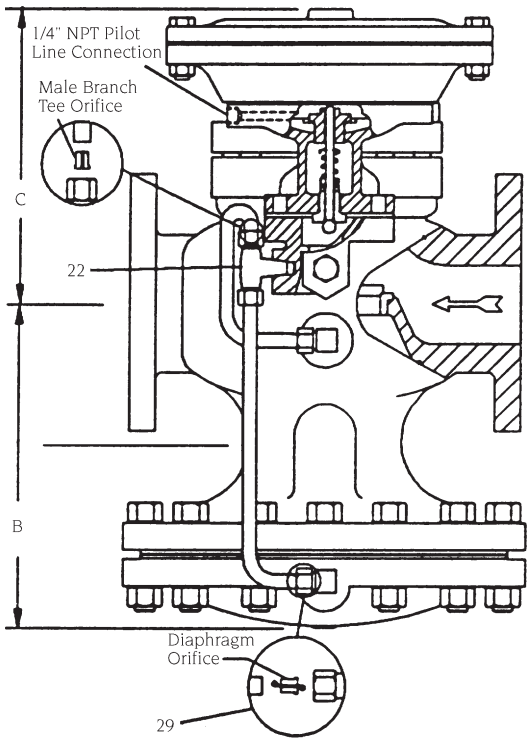
Agents _____Contractor_____

Job No. _____Item No. _____Approved_____

Model DA Air

Pilot-Operated PRESSURE REDUCING VALVE





Pressure-Temperature Ratings

Screwed Valve .....250 psig at 450°F
125-lb Flg. Valve.....125 psig at 353°F
250-lb Flg. Valve.....250 psig at 450°F

NOTE: Pressure limits for *air* and *gas* at ambient temperature are the same as noted above.

Air Pilot Pressure Ranges

Reduced Steam Pressure	Approx. Ratio Air to Steam
3 to 35 psig	1:1
3 to 100 psig	4:1
20 to 200 psig	6:1

Materials

Body .....High-tensile Cast Iron
Main Valve Seat & Disc.....Stainless Steel*
Pilot Valve Seat & Disc .....Stainless Steel
(Cartridge Design)

* Heat-treated to 500 Brinell hardness

Dimensions & Weights

NOTE: Dimensions shown are subject to change. Contact factory, for certified prints (*exact dimensions*) when required.

SIZE	FACE-TO-FACE			A			B	C			D	E	WEIGHTS (*lbs*)*		
	SCWD	FLANGED												FLANGED	
		125 lbs	250 lbs	1:1	4:1	6:1		1:1	4:1	6:1		Ø	SCR.	125-lb	250-lb
1/2"	5 1/8"			7 1/4"	8 3/4"	9 1/2"	5 1/8"	8 1/4"	8 1/2"	8 3/4"	5 7/8"	7/64"	18		
3/4"	5 1/2"			7 1/4"	8 3/4"	9 1/2"	5 3/8"	8 1/4"	8 1/2"	8 3/4"	6 1/2"	1/8"	21		
1"	6 1/8"			7 1/2"	9"	9 3/4"	6 1/8"	8 1/2"	8 3/4"	9"	7"	1/8"	25		
1 1/4"	8 1/2"			9 1/4"	10 3/4"	11 1/2"	7"	8 1/2"	8 3/4"	9"	8 3/4"	5/32"	45		
1 1/2"	9 1/2"			9 1/2"	11"	11 3/4"	7 1/8"	8 3/4"	9"	9 1/4"	8 3/4"	5/32"	55		
2"	9 3/4"	9 1/2"	9 5/8"	9 3/4"	11 1/4"	12"	7 7/8"	8 3/4"	9"	9 1/4"	10 7/8"	13/64"	90	95	105
2 1/2"		10"	10 5/8"	10 1/4"	11 3/4"	12 1/2"	8 3/4"	9"	9 1/4"	9 1/2"	11 3/4"	15/64"		120	135
3"		11"	11 3/4"	10 1/2"	12"	12 3/4"	9 1/8"	9"	9 1/4"	9 1/2"	13 3/4"	17/64"		165	180
4"		13 3/8"	13 7/8"	11 1/4"	12 3/4"	13 1/2"	10 3/8"	9 1/4"	9 1/2"	9 3/4"	14 3/4"	19/64"		260	290
6"		18 1/8"	19"	13 3/4"	15 1/4"	16"	16"	9 1/4"	9 1/2"	9 3/4"	19 3/4"	27/64"		560	590

Ø = Diaphragm Plate Setting Dimension, given for maintenance purposes only. It's measured from the Gasket Surface to the top of the diaphragm plate.

Note: * Weights are based on boxed Weight without pilots, for DA-Pilot add 10 lbs.

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ASME Sect VIII Div I

PR-140
(1/01)

General Data & Instructions

Instructions

1. Pilot assembly is easily connected to main valve pilot adaptor with four (4) screws and gasket. (*This facilitates ease of using combination pilots.*)
2. Inlet pressure should be at least 10 psig higher than reduced pressure for accurate regulation.
3. Regulation accuracy within 1 psig from set pressures when used at catalog stated capacities.
4. Piping on downstream side of valve generally must be increased to eliminate restriction of flow and insure capacity of valve will be within catalog ratings.
5. Valve must be installed in a horizontal line.
6. It is good piping practice to install a trap in a drip leg ahead of the reducing valve.
7. It is a good piping practice to install a strainer ahead of a reducing valve.
8. Valve to be installed with main valve diaphragm below the piping.
9. Pilot Connection: See Installation Instructions
10. Typical Installations: See Fig. 1 and Fig. 2.
11. When ordering spare parts refer to valve model number, size, pressure conditions and serial number of valve on name plate where applicable.
12. Pilot valve can be installed on opposite side of valve shown on cutaway when specifically ordered. (NOTE: *When pilot is installed on opposite side from normal, sensing line connection in pilot body is* 180° *from downstream piping and street elbow along with other piping is required to direct sensing line downstream. On valve sizes* 11/4" *through* 6" *the diaphragm cover also has to be rotated* 180°.)

Cycle of Operation

With air pressure to the air pilot and no pressure on the main valve, the pilot valve is open and the main valve closed. When pressure is applied, the high (*or inlet pressure*) is admitted through the pilot valve seat to the high-pressure side of the main valve diaphragm chamber.

The flow rate through the pilot seat and diaphragm orifice is greater than through the bleed orifice, therefore, the control pressure in the main diaphragm chamber increases. Due to the main valve diaphragm having a greater area than the main valve seat, the main valve diaphragm is forced up, opening the main valve and admitting pressure to the reduced (*or downstream*) side of the valve. As steam flows through the valve, the downstream pressure increases. This pressure is carried back through the sensing line to the underside of the pilot diaphragm. As the downstream pressure increases to the point where the force below the pilot diaphragm balances against the force of the air signal from the controller, the pilot valve will throttle. The pilot valve will maintain the control pressure in the main diaphragm chamber so that the flow through the main valve seat and disc will be just enough to maintain the desired pressure.

When no more steam is required, the pressure under the pilot valve diaphragm will increase to the point where the pilot valve closes. Now the higher pressure in the main valve diaphragm chamber will bleed off through the bleed orifice and the main valve will close.

Downstream (*or reduced*) pressure adjustments are made by turning adjusting knob on panel board (PL-2) or temperature dial on the pneumatic controller.

List of Materials

Item	Part Name	Material
AIR PILOT		
75	Diaphragm Cover	C.I.-A126 CL.B
74	Cap Screws	Steel
*72	Diaphragm	Phosphor Bronze
71	Set Screw	Stainless Steel
70	Stem	Stainless Steel
73	Diaphragm Plate	C.I.-A126 CL.B
7	Hex Nuts	Steel
76	Diaphragm Chamber	C.I.-A126 CL.B
9	Cap Screws	Steel
*77	Diaphragm& Washer (2)	Phosphor Bronze
11	Body Pilot	C.I.-A126 CL.B
12[1]	Gasket	302 Stainless Steel
13	Packing House Bushing	Brass B-16
*14	Head & Seat Ass'y	Stainless Steel
*16[1]	Seat Gasket	302 Stainless Steel
*17[1]	Gasket	Non-Asbestos
MAIN VALVE		
18	Pilot Adaptor	C.I.-A126 CL.B
19	Plug, Screen	Brass B-16
*20	Screen, 40 mesh	Stainless Steel
21	Nipple	Blk. Pipe, Stl. SCH80
22	Male Branch Tee	Brass
23	Tubing, Pilot-to-Body	Copper Tubing
24	Elbow, Tube-to-Pipe	Brass
25	Tubing, Pilot-to-Diaphragm	Copper Tubing
26	Main Valve Body	C.I.-A126 CL.B
27	Spring	302 Stainless Steel
*28[1]	Gasket, Diaphragm Cvr. (2)	Non-Asbestos
29	Diaphragm Orifice Ass'y	Brass (SS *wire*)
*30	Diaphragm, Main Valve (2)	Phosphor Bronze
31	Diaphragm Cover	C.I.-A126 CL.B
32	Set Screw	Stainless Steel
33	Name Plate (*Serial No.*)	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	420 Stainless Steel
*40	Disc & Stem Ass'y	Stainless Steel
*41[1]	Gasket, Bottom Cover	Non-Asbestos
42[3]	Bottom Cover Ass'y	C.I.-A126 CL.B
43	Cap Screws	Steel

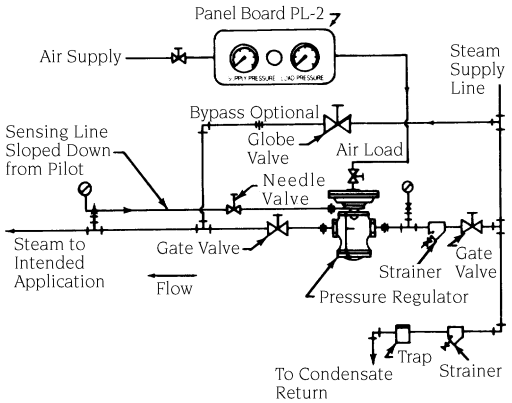
[1] Must use factory replacement parts for these gaskets
[2] Not used on 1/2", 3/4" and 1" valves
[3] Stem not guided in Bottom Cover on 1/2", 3/4" and 1" valves
* Denotes RECOMMENDED SPARE PARTS

How to Order

Specify:

1. Valve Size (*Give flange rating desired for flanged valves*)
2. Inlet pressure and temperature
3. Outlet pressure
4. Pressure range desired
5. Capacity requirements
6. Intended use

Pressure Reducing Station



Pneumatic Temperature Regulator Station