

PRV 47 - PRESSURE REDUCING VALVE Installation and Maintenance

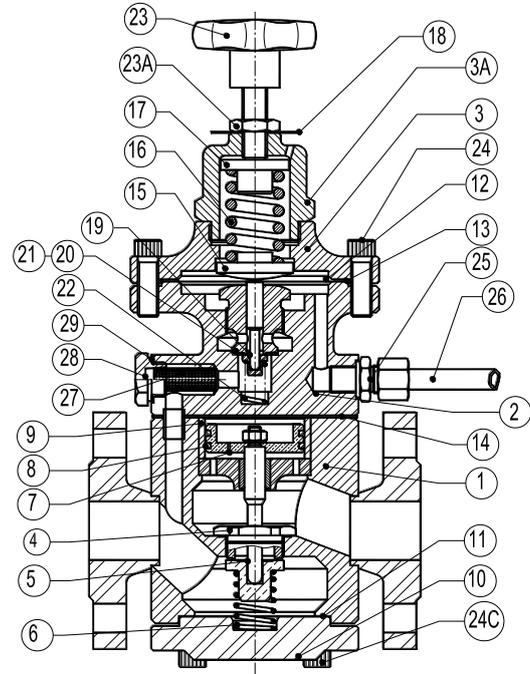
The PRV 47 is a pilot operated pressure reducing valve and to achieve long and trouble free service it is necessary that it should be properly installed and regularly inspected and maintained.

OPERATION

The reduced pressure is regulated by the lift (or opening) of the main valve 5 which controls the flow. This main valve is opened by steam (or another gas) supplied to the piston 7 which comes from the pilot valve 19, 20 and closed by the main valve spring 6.

The pilot valve opening (and hence the piston pressure) is determined by the combination of the reduced pressure on the underside of the diaphragm 12 (connected by balance pipe 26) and the adjusting spring load 16.

The reduced pressure is therefore accurately maintained despite variations of inlet pressure or capacity.



Regulators occasionally give trouble (particularly on new installations) due to dirt and other foreign matter fouling the internals. In this event, the trouble can often be quickly eliminated by applying the following first aid treatment:

1. With pressure "off", remove pilot valve top assembly complete (removing the 4 screws 24 on the top) and check by pushing down that the piston and main valve are moving freely and that the main valve returns smartly to it's seat.

Unscrew bottom cover screws 24C, remove cover 10 and withdraw main valve. Clean all parts and re-seat main valve if necessary, reassemble and test.

Warning: when replacing the main valve, be sure that the stem is properly introduced in the plug. Wrong positioning will damage valve and piston.

2. Remove top cap, adjusting screw, spring top cover and diaphragm 3, 12, 24 and check the spring, diaphragm and gasket. Turn on steam or air supply and close outlet stop valve (after the balancing pipe connection). Leakage from the low pressure orifice (adjacent to the pilot valve) may originate at the pilot valve 19, 20 and or main valve 4, 5. The leakage on the pilot valve can sometimes be stopped by lightly tapping the valve end of the stem (19) with a soft hammer while under pressure.

Warning: there will be a discharge upwards from the low pressure orifice.

3. With pressure off, unscrew pilot valve (19, 20) and check the pilot valve seat, valve and spring. Clean and re-seat if necessary. It is important to check also the pilot valve copper gasket. Reassemble and test.

The valve is now mechanically correct but if it's still not working well, consult our Trouble Shooting Chart. If you have any doubt about the installation please send us a sketch of the layout, including the following information:

- 1- Inlet pressure and limits of variation
- 2- Outlet pressure (minimum and maximum)
- 3- Maximum flow (steam or compressed air)
- 4- Minimum operating flow
- 5- Whether dead-tight shut-off is being obtained under no-flow conditions.
- 6- How long has the valve been in service.
- 7- Installation diagram including pipe sizes, valves, strainers, steam traps, etc.
- 8- A complete description of the faulty symptoms.

INSTALLATION



Sizing: The correct sizing and layout of regulators, pipework, stop valves, strainers and other fittings is absolutely important for a good performance (see AS - assembling sheets).

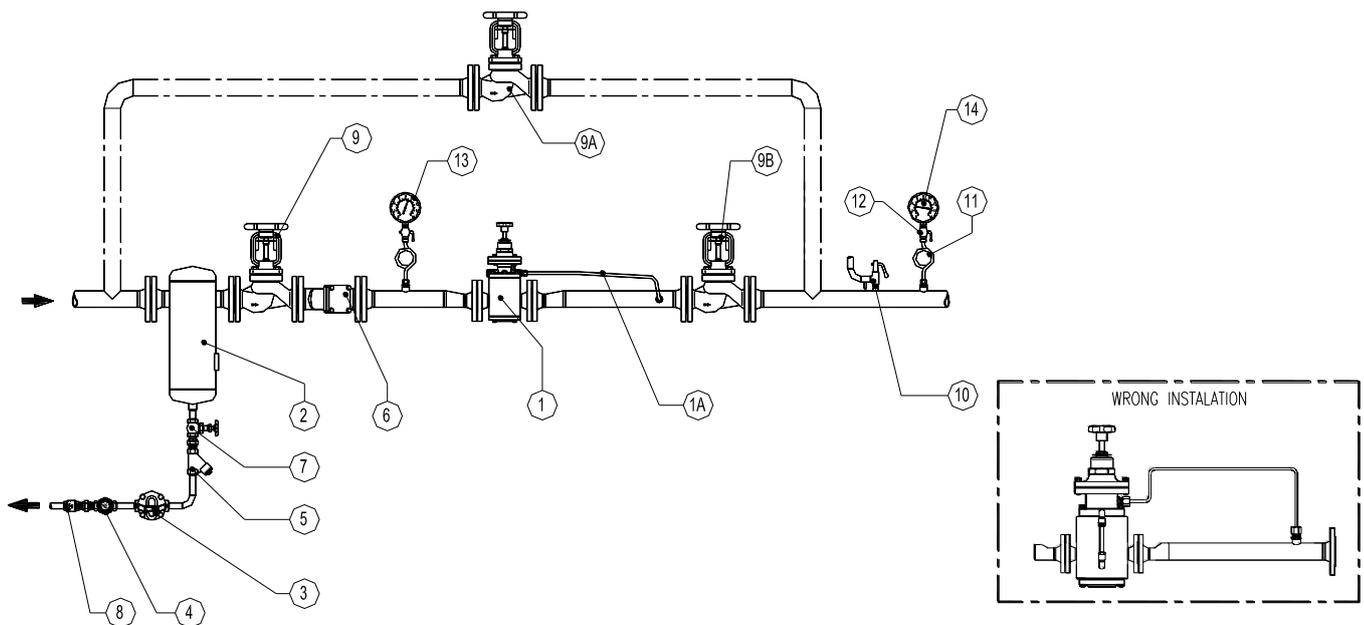
A pipe length equal to 10 pipe diameters should be kept before the valve.

Steam traps: A steam separator and steam trap is necessary before the valve. A second steam trap should be fitted on the outlet of the valve to prevent water logging and weir.

Safety valve: The installation should be protected by a safety valve duly installed and sized.

Balance pipe: The balance pipe must be arranged to drain towards low pressure pipe. It should be connected into the downstream pipe at the point where smooth flow occurs. Where isolation of the regulator is desired a stop valve should be fitted in the balance pipe.

Warning: if a jointing compound is used it should not be allowed to foul the internal ports and working parts of the valve and/or system pipes.





SETTING

Before putting any control valve in service, all pipes should be clean from dirt and pipe scale. We also recommend cleaning the inlet strainer one week after the first starts up. Regular maintenance must clean the strainer at regular intervals.

Setting under no-flow conditions:

1. Slowly open the inlet stop valve and apply a little tension to the regulating spring by rotating the handwheel 23 clockwise for a few turns. Then slowly open the outlet stop valve just a small percentage of his travel. When the downstream pressure starts to rise, close the inlet valve, remove all tension from the regulating spring and close the downstream stop valve.
2. With the downstream stop valve closed, slowly open the inlet valve and wait about one minute to confirm that the reduced pressure is maintained at zero. This is to check that the regulator gives dead-tight shut-off under no-flow conditions.
3. Slowly raise the reduced pressure by rotating the regulator handwheel clockwise until the desired pressure is obtained (do not forget to set the safety valve if necessary).Then, slowly open the outlet stop valve to a fully open position. Apart from a possible initial fall of the downstream pressure whilst the system is warmed through, the regulator should continue to maintain the downstream pressure just below the set value. The regulator can now be locked with the lock-nut 23A.

Setting on flow:

1. With the inlet and outlet stop valves closed apply a little tension to the regulating spring by rotating the handwheel 23 clockwise for a few turns. Slowly open the inlet and outlet stop valves and wait until all condensate has been removed and the system properly warmed through. Then slowly raise the reduced pressure until the desired value (do not forget to set the safety valve if necessary).
2. If the flow is varying it is necessary to adjust till find the correct setting .The regulator can now be locked with the lock-nut 23A.

TROUBLE SHOOTING CHART

FAULT	POSSIBLE REASON	SOLUTION
Leakage from spring chamber bleed hole.	Broken diaphragm	Replace diaphragm and gasket.
Reduced pressure not maintained as flow varies. Safety valve blows when flow ceases.	Piston stuck due to: 1 – Dirt around piston and piston rings;	Clean and re-assemble. Check the system strainers and clean.
	2 – Broken piston rings;	Replace piston rings
	3 – Scored piston liner.	Replace
	Main valve lid/piston stuck in guides	Free and if necessary replace worn parts.
	Relay port between relay valve diaphragm chamber and main valve outlet blocked	Clear blockage
Reduced pressure not maintained when flow approaches maximum, but is correct at low-flow and no-flow conditions.	Regulator undersized	Replace with a larger valve or consider fitting another valve in parallel (assuming that the pipework is sized for larger capacities)



	Pressure differential across the regulator too small	None, unless inlet or reduced pressure can be adjusted to give increased differential.
	Downstream pipework and fittings undersized	None, unless change the pipework None, this a basic system fault
	Upstream pressure not being maintained	
Reduced pressure correct on large flow and no-flow conditions but is erratic on small flows.	Valve is oversized	Replace with smaller valve. Fit a reduced main valve lid. Check main and pilot valves for erosion and replace as necessary.
Reduced pressure builds up on no-flow conditions but otherwise operates as required.	Main valve lid withdrawn or stuck in guides	Free and grind main valve lid into seat
	Pilot valve lid wiredrawn	Grind pilot valve lid into seat
	Inlet medium leaking past pilot valve seat gasket	Tighten down pilot valve seat. Replace gasket if necessary
	Condensate accumulating in valve	Fit a steam trap to the inlet pipe
Large reduced pressure fluctuations under all flow conditions.	Inlet pipe and/or fittings are undersized.	If undersized replace pipework and/or fittings.
	Inlet flange gasket restricting flow to the valve.	Rectify gasket
	Relay port from main valve inlet to pilot valve to pilot valve is partially blocked.	Clear blockage
	Valve oversized	Fit a smaller valve. Fit a reduced main valve lid.
Reduced pressure oscillates for a short period when starting up after a system shut-down.	Condensate accumulating in the regulator.	Fit steam traps to inlet and outlet pipes.



ATTENTION

- LOSS OF WARRANTY: Total or partial disregard of above instructions involves loss of any right to warranty.