

15. By-Pass Valve

By-Pass valve is defined as a valve fitted on the pressure pipe in the pipe system and which secures the whole pipe system in the event of constant pressure increase. The By-Pass valve has return flow to the liquid tank.

PETROLAND By-Pass valves have been showed as below.

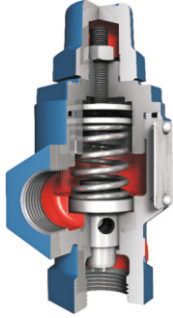


Figure 12: PB Type By-Pass Valve



Figure 13: PBF Type By-Pass Valve

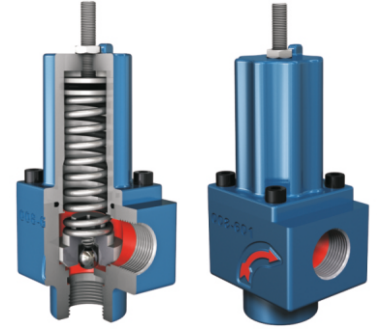


Figure 14: PC Type By-Pass Valve



If the possibility exists to block the pump's pressure line, the pressure line must be fitted with a bypass valve to take the full liquid volume - as otherwise there is a risk of explosion

The by-pass valve protects pumps in the event of brief pulsating excess pressures and not in the event of constant pressure increase. By-pass should not be open continuously to protect system against any damage or explosion.

PETROLAND Pumps can be supplied with or without By-Pass Valves.



The pipe system must be protected against excess pressure by use of the PETROLAND By-Pass valve.



The By-Pass line should return to feeding tank.



By-pass valve should be fitted correctly.

Technical Specifications and Models of PB Series By-Pass valves			
By-Pass Type	Max. Operating Pressure	By-Pass Inlet-Outlet	Connection Type
PB 25	15 BAR (217.5 psi)	1"	BSP NPT
PB 32		1¼"	
PB 40		1½"	
PB 50		2"	

Technical Specifications and Models of PC Series By-Pass valves			
By-Pass Type	Max. Operating Pressure	By-Pass Inlet-Outlet	Connection Type
PC 25	15 BAR (217.5 psi)	1"	BSP NPT
PC 32		1¼"	
PC 40		1½"	
PC 50		2"	

Technical Specifications and Models of PBF Series By-Pass valves.					
By-Pass Type	Max. Operating Pressure	By-Pass Inlet-Outlet	Connection Type		
PBF 32	15 BAR (217.5 psi)	1¼"	BSP	NPT	Special Flange Application Upon Request
PBF 40		1½"			
PBF 50		2"			
PBF 65		2½"			

Table 5: By-Pass models and technical specifications.

If liquids possess properties which may block the bypass valve and prevent it from working, you must use another equivalent device rather than a PETROLAND by-pass valve.



The liquid volume may not circulate through the by-pass valve for a long period of time. Circulation over a long period of time through the by-pass valve causes a significant heating up of the pump and pump liquid, and this may result in destruction of the pump.



Never set or adjust the bypass valve in operation on account of the danger of squirting cold, hot, etching or poisonous liquids under pressure.

15.1. Working Principle of By-Pass Valve

Fluid forces to open the poppet of the by-pass valve as the pressure raises in the discharge pipeline instantly. If the pressure raised greater then the setting pressure, pressurized spring lets the poppet to open and start by-pass circulation. Fluid returns into feed tank. Circulation over a long period of time through the by-pass valve causes a significant heating up.

By-pass valve is the most important component for the LPG and anhydrous ammonia handling applications. By-pass valve opens precisely at the preset spring pressure even if the capacity changes. *Figure 15* shows that the by – pass opens at 9 Bar preset value between 40 liters /minute and 400 liters /minutes. By-pass valve has only two moving parts which provides simple and safe construction.

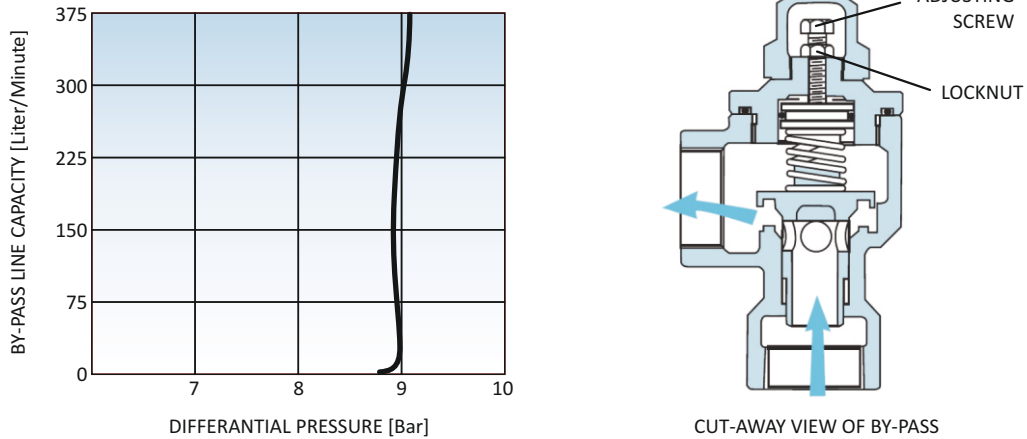


Figure 15: Performance curve of By-Pass Valve 9 Bar preset pressure values and Cut-away view

15.2. Setting the By-Pass Valve

The bypass valve is always set at the factory. The valve is set in accordance with either; Customer instructions (Usually 2 bar greater than operating pressure) or PETROLAND's default setting (5-6 Bar)

Any change to the pump's operating pressure must be followed by a change to the valve's setting - the working pressure must however not exceed the maximum allowable pressure of the pump/valve.

If the valve is not reset, this will mean either of below;

- That the valve's safety function fails so that there is a risk of pressure accumulation.
- That the valve remains open permanently, creating a significant heating up of the pump and pump liquid – which must not last for a long period of time.



After setting the valve, locknut must be tightened (See Figure 15).