

Pressure Relief valve P 11 Safety valve V 11

TA

P 11 V 11

PN 16 - 25 DN 25 - 200 Water and steam 220 °C
Pneumatic spring
Opens at increasing pressure at the inlet.

Advantages

- ▶ Setting of inlet pressure from 0 to 16 bar without any spring change.
- ▶ High accuracy.
- ▶ Low noise operation.
- ▶ Very long life of diaphragm, because it always works with low differential pressure of approx. 20 kPa.
- ▶ Maximal security. In case of diaphragm rupture the auxiliary spring instantly fully opens the valve.
- ▶ Wrong adjustment of safety valve is not possible if connected to the same pressure vessel as reducing or relief valve.

Function P 11

The regulator consists of a valve (1), an actuator (3) and a pressure vessel (8). The fluid pressure at the valve's inlet acts through the impulse pipe (2) to the top side of diaphragm (5), and attempts to open the valve together with force of the auxiliary spring (4). The pressure of compressed air (9) in the pressure vessel acts through the connection pipe (6) to the bottom side of diaphragm, and attempts to close the valve. As long as the forces on the diaphragm are balanced, the valve's plug stands still. If the fluid pressure increases, the valve opens until the new balance is reached. In case of diaphragm rupture, the pressure of fluid on top side and compressed air on bottom side of diaphragm are equalized, and the auxiliary spring instantly fully opens the valve. The force of the auxiliary spring corresponds to a pressure of approx. 20 kPa.

Function V 11

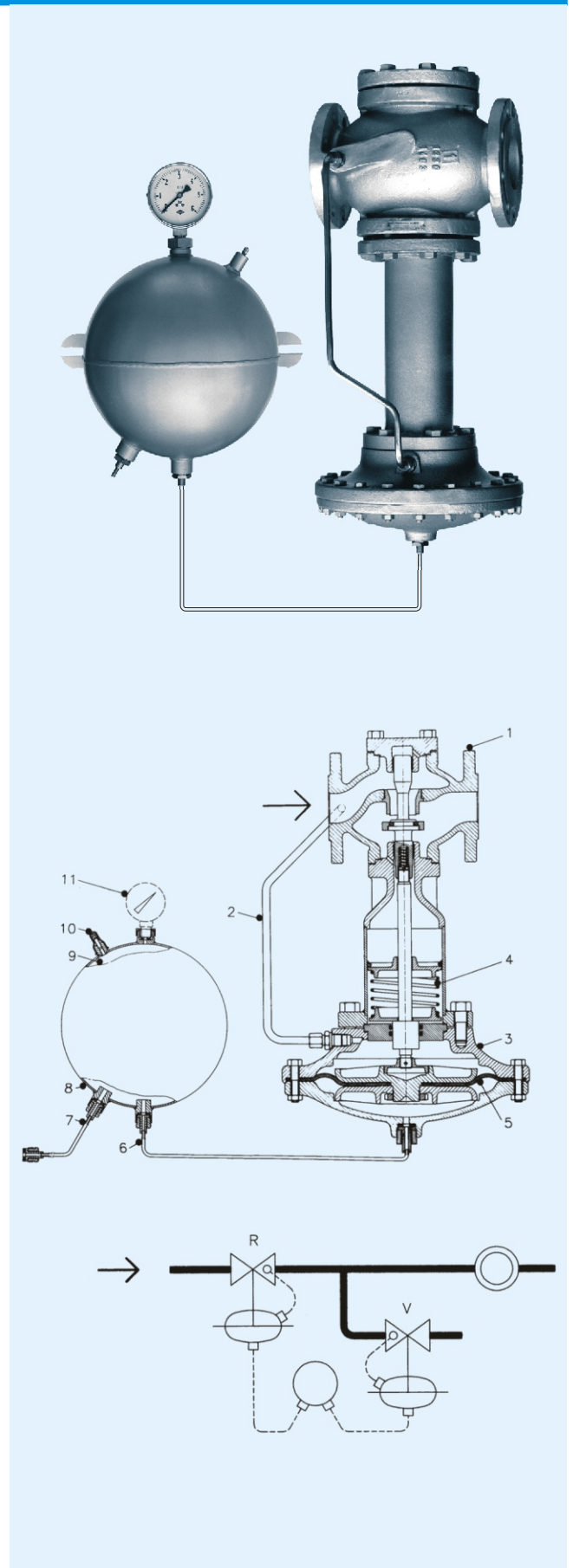
Function is the same as at P 11, only the force of the auxiliary spring is smaller. It corresponds to the pressure of approx. 5 kPa.

Combination of reducing and safety valve

If reducing valve R11 and safety valve V 11 are connected to the same pressure vessel, the reducing valve will be normally open, and safety valve tightly closed. If the reducing valve is forced to close completely, but the pressure at the outlet accidentally rises for any reasons by additional 15 kPa, the safety valve starts to open. Pressure difference between acting ranges of both valves depends on forces of auxiliary springs. This combination ensures the best possible accuracy and security of two jointly working valves. Caution: reducing and relief valve cannot be connected to the same pressure vessel, because the forces of both springs are the same. In such case the relief valve would remain constantly open.

Combination of pressure relief and safety valve

If pressure relief and safety valve are connected to the same pressure vessel, both valves will be normally closed. If the pressure at the inlet rises, the pressure at the inlet rises, the pressure relief valve opens. If the pressure rises for any reason for additional 15 kPa, safety valve opens as well.



Valve installation

Install the valve into a horizontal pipeline with actuator body below. The direction of flow is shown with an arrow on the valve body. Installation of a strainer in front of pressure relief and safety valve is NOT allowed. If the regulated fluid is steam, or the temperature exceeds 130 °C, a cooling vessel (OH 150) must be installed in the impulse pipe (2). Prior to operation, fill the cooling vessel with cold water and vent it. For impulse and connection pipe use copper pipe Ø10x1.

Pressure vessel installation

The pressure vessel has a spherical form with two hooks for mounting on wall. The vessel type **TP 310** is provided with a filling valve (10) and one connection (7) for the connecting pipe. The vessel type **TPM 310** is additionally provided with a manometer connection (11). Type **TPDM 310** is provided with two connections for the connecting pipe, and type **TPDM 310** has a manometer connection in addition. Prior to mounting of the connecting pipe and manometer, check the sealing surfaces and clean them if necessary. Install very carefully and check tightness with soap or spray. Make sure to use only original rubber seals. Never use hemp or teflon tape. Install the vessel as far away from hot surfaces as possible.

Pressure adjustment

Fill the pressure vessel with compressed air or nitrogen. The pressure in the vessel must be by approx. 20 kPa higher than the desired pressure of regulated fluid.

Selection of size

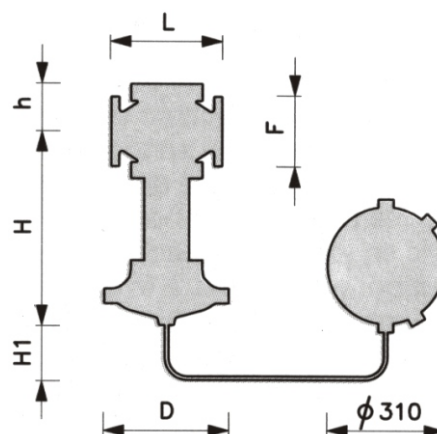
It is recommended to choose the flow speed of water within 0,5 to 2 m/s. Optimal speed is approx. 1 m/s. Control the pressure drop in valve by formula: $\Delta p = 100 \times V^2 / K_{vs}^2$ [kPa], where V is flow in m³/h.

Ordering data

Safety valve type V11 DN PN, valve body, with pressure vessel type TP... 310.
Relief valve type P11 DN PN, valve body....., with pressure vessel type TP ... 310.

Specifications

Nominal pressure	PN16/25
Maximal pressure drop in valve	25 bar
Maximal pressure adjustment	25 bar
Maximal water temperature	220 °C
Flanges	DIN 2501
Valve body	
PN 16	ductile iron (GGG-40.3)
PN 25	cast steel (GS-C25)
Actuator body	cast steel (GS-C25)
Diaphragm	NBR
Valve seat	stainless steel
Valve plug	
T < 150 °C	stainless steel with EPDM insert
T > 150 °C	stainless steel



Dimensions

Nominal size DN	25	32	40	50	65	80	100	125	150	200	250
K _{vs}	m ³ /h	9	17	19	32	50	80	110	120	260	280
Length	L	160	180	200	230	290	310	350	400	480	600
Height	H	540	555	555	565	585	595	620	630	800	840
Height	h	80	95	95	105	125	135	165	175	215	255
Diameter	D	330	330	330	330	330	330	330	330	375	375
Diameter	F	115	140	150	165	185	200	235	270	300	360
Weight	kg	45	50	52	60	74	83	104	119	256	318