Pressure Reducing Valve C 7105

General

The pressure reducing valve is primarily used to prevent chlorine recondensing and thus avoid the destruction of PVC components.

A few points of interest:

Chlorine is the most commonly used disinfectant for water treatment. It is stored as a liquid in steel tanks. Liquid elementary chlorine does not corrode unalloyed steel. It does, however, attack PVC and the material loses its original form. Since most metering units for chlorine gas are made of PVC, it is essential to ensure that the various components are protected against liquid chlorine.

Important

Liquid chlorine must not be confused with chlorine gas dissolved in water. PVC is resistant to such aqueous solutions of chlorine gas.

Problems do not arise if the saturated chlorine gas withdrawn from the chlorine tanks remains in the gaseous state. However, if the chlorine gas condenses in the pipes on account of certain temperatures (as water vapour condenses on cold surfaces), the downstream plants and equipment can suffer serious damage.

The slightest loss of energy will immediately result in the precipitation of liquid chlorine. Energy is lost when the pipes downstream of the chlorine tank are colder than the liquid chlorine in the tank.

It is important to know that this applies at all temperatures. In other words, chlorine will always recondense regardless of whether the gas flows from a chlorine tank at 15 °C into a pipe at 12 °C or from a tank at 30 °C into a pipe at 28 °C.

How can chlorine be prevented from recondensing?

The aforementioned loss of energy can be compensated by supplying energy through a heating block which, however, requires a constant supply of energy in the form of electricity.

A pressure reducing valve is very much more effective and does not require any auxiliary energy. It reduces the pressure so far that the chlorine would only recondense at a temperature far below 0 °C in the downstream piping. Such temperatures are effectively never encountered. The greatest advantage is that a constant pressure and the absolute pressure value after the pressure reducing valve are less important than the fact that this pressure is generally considerably below that in the tank with liquid chlorine.

Functional description

The pressure of approx. 2 bar is determined by the spring cap (1) which presses the compressive spring (2) against the diaphragm (3) by a certain amount.

The diaphragm (3) presses the valve ball (5) against the compressive spring (6) so that the valve opens. Chlorine gas streams in at E, passes through the valve seat (4) to the space below the diaphragm (3) and leaves the reducing valve through A. The pressure is reduced until it equals the force of the prestressed compressive spring (2) multiplied by the area of the diaphragm. If the equilibrium is disturbed, for instance because more or less chlorine gas is withdrawn or on account of fluctuations in the supply pressure at E, the diaphragm changes its position so that the ball (5) adopts a different position in relation to the valve seat (4). The volume of gas flowing through the valve is adjusted so that the pressure under the diaphragm (3) is once again equal to the pretension of the compressive spring (2).

Due to the design of the valve, the pressure deviates from the setpoint since the compressive spring (2) has a different pretension depending on the opening position of the control wedge and this pretension then produces a different pressure for achieving an equilibrium (permanent proportional deviation). The pressure reducing valve is set to approx. 2.5 bar (with zero flow) by the manufacturer. The pressure adjusts to approx. 2 bar at a flow of 20 kg/h.

If the diaphragm ruptures, chlorine does not escape, but the pressure increases without reduction until the upstream pressure is reached.

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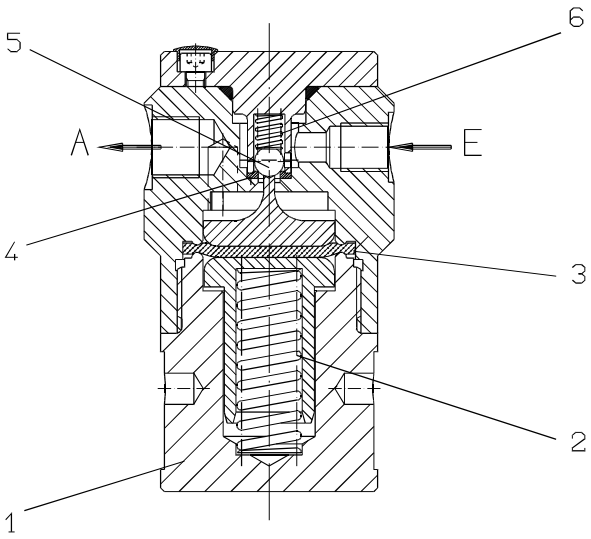
Technical data

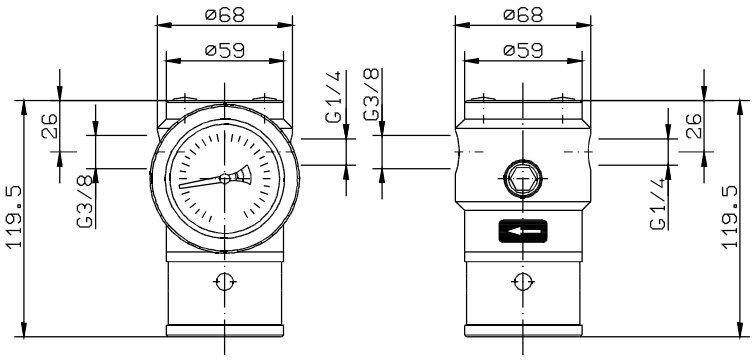
Supply pressure max.	15 bar
Reduced pressure	Invariable, approx. 2 bar
Capacity max.	60 kg/h Cl_2
Materials in contact with chlorine gas: Steel, Monel, Hastelloy, Viton	
Surface finish	Chemical nickel plating
Weight	Approx. 2 kg

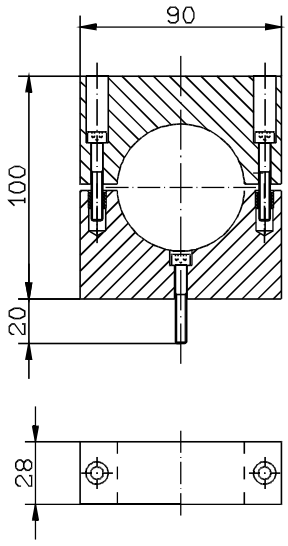


Part No.

C 7105 assembly	Part Number
without pressure gauge Connections G 1/4i-G 3/8i	20729202
without pressure gauge Connections for pipe d 12x1	20733766
without pressure gauge Connections for pipe d 8x1	20733765
with pressure gauge 0-16 bar Connections G 1/4-G 3/8i	20733764
with pressure gauge 0-16 bar Connections for pipe d 12x1	20733763
with pressure gauge 0-16 bar Connections for pipe d 8x1	20733762

Dimensions





Retaining clamp, Part No. 24508