

General

The main application of the pressure reducing valve is to prevent reliquefaction of chlorine gas so that destruction of PVC parts is avoided.

Some explanations:

The main disinfectant used in water treatment is chlorine. It is normally stored as a liquid in steel tanks. Elementary liquid chlorine does not at all attack plain steel. However, PVC is strongly attacked and loses its original shape. As most chlorinators are made of PVC, it is essential to prevent liquid chlorine from entering the components of the unit.

Note:

Liquid chlorine must never be mixed up with chlorine gas solved in water. PVC is reasonably resistant against the latter solution.

As long as the saturated chlorine gas taken from the tank stays gaseous, there is no problem. If there is any temperature (i.e.: energy) loss in the chlorine-leading pipes or systems the saturated chlorine will reliquefy and will never evaporate afterwards if the temperature stays low. To avoid reliquefaction along the line and system, make sure that the installation never passes cold areas or open windows where, at night time, the above mentioned problem could occur.

It is very important to understand that this problem can occur at any temperature if the chlorine gas is extracted as a saturated vapor from the tank and faces a temperature in the line which is lower than the tank temperature. As an example: If the gas comes from a tank with a temperature of 30°C it will condense to liquid chlorine at 28°C .

How to avoid chlorine reliquefaction

The above mentioned energy loss could be compensated for by means of a heater block. Such device is available but requires heating energy all the time (electrical current).

It is more reasonable to install a pressure reducing valve because it doesn't need any auxiliary energy. It lowers the pressure to that extent that the chlorine only would reliquefy at a temperature far below 0°C. Such temperatures are normally not to be expected in normal plants. It is an advantage that it is not important how accurately the pressure is controlled or at which pressure the set-point is adjusted. The main point is that the pressure is by far lower than the pressure in the liquid chlorine tank.



Functional description

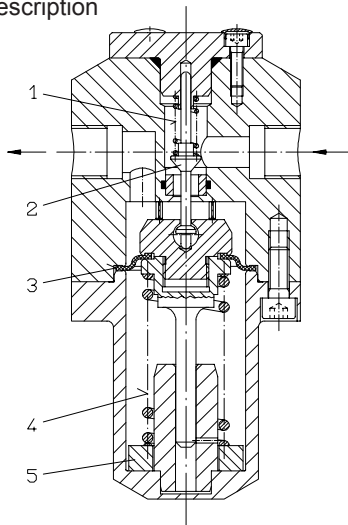
The reducing valve is available for three fix-adjusted set-points of reduced pressure. Depending on whether the spring (4) will be preset by means of no, one or two rings (5) there is a reduced pressure of 0.5 - 1.5 - 2.5 bar.

The control function results from a force balance between the spring force and the reduced pressure acting on diaphragm (3). With constant chlorine consumption the reduced pressure is as well constant, the control cone (2) being positioned at a certain distance to the control seat. Spring (1) is needed to provide a backlash-free connection between control cone (2) and the center part of the diaphragm (3).

If the flow increases because of rising consumption, the reduced pressure is less pushing on diaphragm (3). Because of this, spring (4) moves the control cone (2) more into the opening position. Thus the required increased flow rate is satisfied.

With less consumption, the described function is acting reversely. The reduced pressure increases slightly until diaphragm (3) moves against spring (4) so far that cone (2) is in appropriate position to the seat. The pressure variation between zero and maximum consumption can be gathered from the curves below.

In the case of a diaphragm rupture, there is no leakage but a pressure increase in the same height as the incoming pressure.

Schematic diagram
 for functional description

Order example

To protect a chlorinator against entering of liquid chlorine, a pressure reducing valve must be mounted. The maximum required flow rate is 80 kg/h. For chlorinators, it is recommended to have an incoming pressure of at least 2 bar. Therefore the following reducing valve should be selected:

Pressure reducing valve C 7110

100 kg/h flow rate

2.5 bar reduced pressure

Connections 3/4"

Part No. 20728363

Mounting bracket

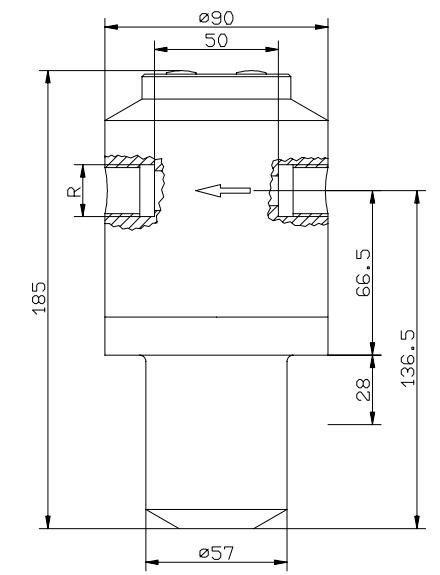
Part No. 24508

Spare parts kit

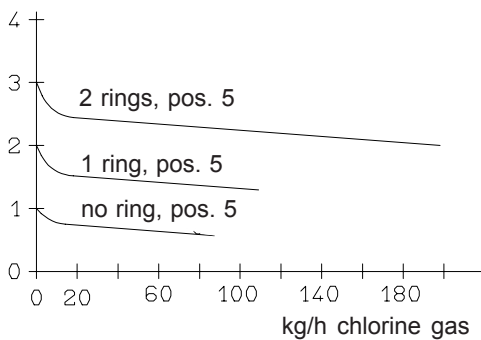
Part No. 33328

Dimensions

Pressure reducing valve


Performance curves

Reduced pressure [bar]


Selection table

kg/h Cl ₂	bar	Connection G	Dim L	Part No.
60	0.5	G 1/2	60	20728357
60	1.5	G 1/2	60	20728358
60	2.5	G 1/2	60	20728359
100	0.5	G 3/4	54	20728361
100	1.5	G 3/4	54	20728362
100	2.5	G 3/4	54	20728363
200	0.5	G 1	50	20728364
200	1.5	G 1	50	20728365
200	2.5	G 1	50	20728366

Mounting device with dowel

Part No. 24508

Spare parts kit

Part No. 33328

Technical data

Inlet pressure max.	15 bar
Materials in contact with the chlorine gas	Steel, Monel, Hastelloy, Viton
Surface protection plated	chemical nickel
Weight	approx. 5 kg

Mounting bracket
