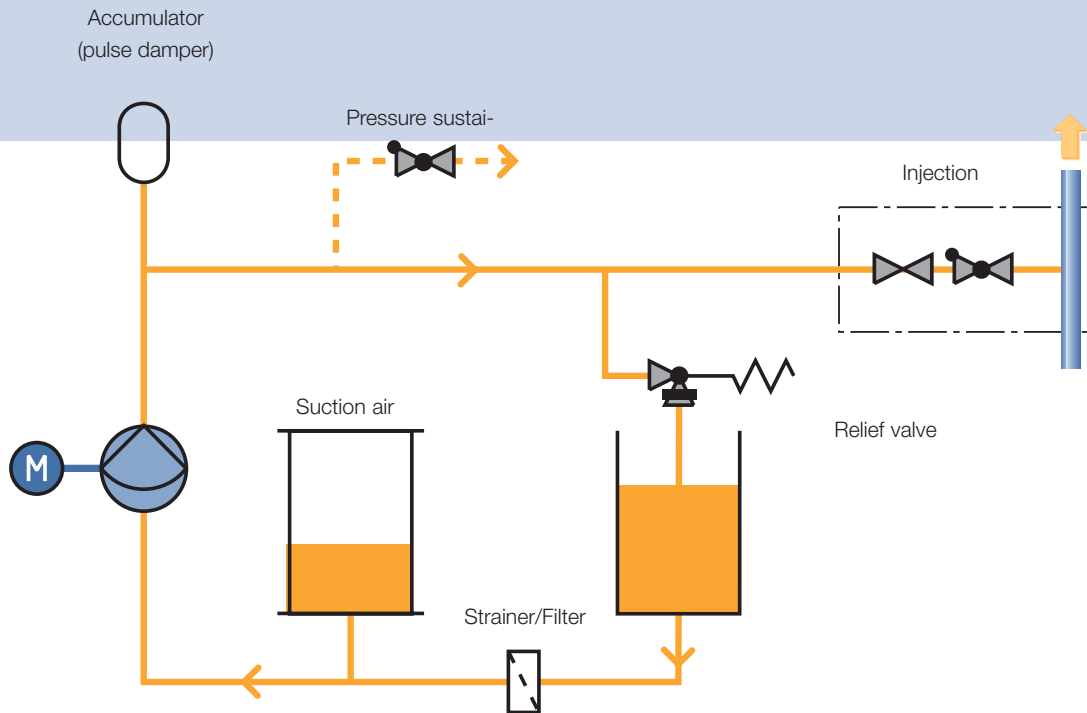


Metering Pump Accessories



Metering Pumps Accessories

Typical arrangement of pulsation dampers, strainers, valves and injection points



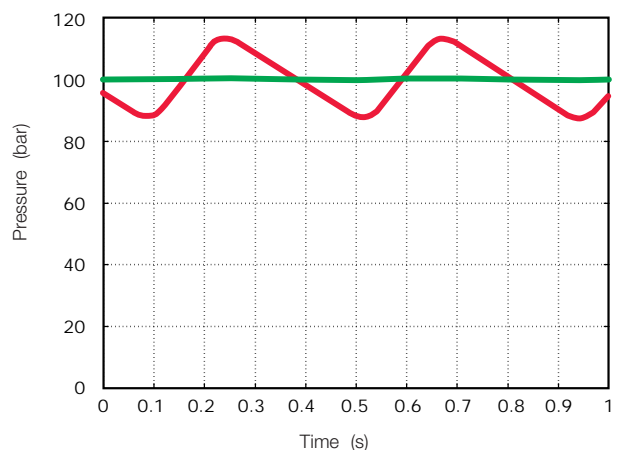
Pulsation dampers

(Air vessels and accumulators)

These pulsation dampers are used in long suction and discharge pipes to smooth the pulsation of the flow. They also inhibit shock waves arising from mass acceleration or acoustic phenomenon.

The elasticity of an enclosed gas stores and discharges part of the delivery volume. This results in a more constant discharge stream, which offers increased protection against cavitation and permits in some cases the use of smaller pipe diameters.

Air vessels have direct contact between gas and liquid. Different style pulse dampers are used on the suction and the discharge side of a pump.



Suction-side air vessel

Suction air vessels are fitted in the suction pipe and have inlet and outlet connectors as well as connections for air and drainage.

Standard designs

- Glass air vessel for the food industry
 Sizes: 1 to 20 litres,
 Connections: DIN or ANSI flange
 Thread
 Food connections
 Heating jacket optional
 - Air vessel with internal coating (rubber or PTFE)
 Sizes: 1.5 to 25 litres
 Connections: DIN or ANSI flange
 - Air vessel in plastic (PVC, PVDF etc.)
 Sizes: Up to 25 litres
 Connections: DIN or ANSI flange,
 Thread
- Suction air vessels can be fitted with a product loss fail-safe device. This is a float switch which is actuated when no product is present. It can be used to switch the pump on and off. bei Produktausfall anspricht und zum Ausschalten der Pumpe benutzt werden kann.



Nominal volume l	DN mm	B mm	Ø G
1	15	214	125
2,5	25	318	175
5,5	40	318	175
8,5	50	522	225
12,0	50	318	300
20,0	80	522	300

Discharge-side air vessels

Discharge air vessels are fitted on the outlet side of the pump. They have inlet and outlet connectors as well as connections for ventilation, drainage and a pressure gauge.

Standard designs

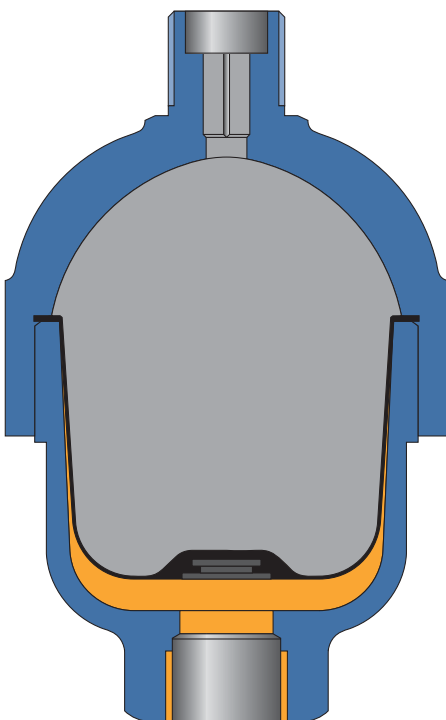
- Air vessel in acid-resistant Cr-Ni-Mo steel
 - Sizes: 0.5 to 25 litres
 - Connections: DIN or ANSI flange
 - Thread
 - Food connections
 - Heating jacket optional
- Air vessel with internal coating (rubber or PTFE)
 - Sizes: 1.5 to 25 litres
 - Connections: DIN or ANSI flange

Discharge air vessels should be fitted with pressure gauges to monitor the performance of the air vessel. When the pressure surges become too high the air buffer must be replenished. The air vessel is fitted with air vent and drain valves for this purpose. Pressure vessel certification may be required, if the calculated product from pressure x volume exceeds certain statutory limits.



Discharge-side air vessel

Accumulators



Accumulators

Accumulators are used for higher pressures, where air vessels are no longer economical due to their size or when the gas buffer in the air vessel could be absorbed by the liquid.

In an accumulator the gas is separated from the metered fluid by a diaphragm.

Standard designs

- Accumulator in acid-resistant Cr-Ni-Mo steel
 - Diaphragms of perbunane, butyl or viton rubber
 - Sizes: 0.35 to 50 litres
 - Connectors: Thread
 - DIN or ANSI flange
 - Accumulator with internal coating
 - Diaphragms of perbunane, butyl
 - Sizes: 1.5 to 25 litres
 - Connections: DIN or ANSI flange
 - Accumulators in special –designs or materials
 - PTFE-diaphragms
 - Sizes: 0.25, 0.5 or 1 litre
 - Connections: DIN or ANSI flange
- Accumulators are also available with double-diaphragms with diaphragm rupture monitoring.

Strainers

Strainers prevent malfunctions in metering pumps and protect the pump from damage.

Dirt particles (e.g. welding beads, rust, sand, fibres) in metered fluids and piping can never be completely excluded. They can cause fluctuations in the flow or even interrupt the metering process. They can also cause pump valves to leak and thereby render them unusable.

Strainers are essential for reliable and trouble-free operation, especially when metering small volumes.

Where strainers cannot be used for certain fluids, such as suspensions, pumps have to be fitted with special valves.



Strainers

Parameters determining strainer type

- Flow rate
- Dirt content
- Particle size
- Viscosity
- Maximum acceptable pressure loss
- Smallest acceptable particle size

Specification

< 1 l/h	– ca. 0.02 mm
1 bis 20 l/h	– ca. 0.10 mm
> 20 l/h	– ca. 0.20 mm
Nominal sizes	DN 8 to 250 mm
Materials	steel, grey cast iron, Cr-Ni steel, coated versions
Connections	DIN or ANSI flange Threads Compression fittings Food connections (e.g. DIN 11851) Adhesive connections

Advantages

- Large filter area
- Low pressure loss
- Long intervals between maintenance
- Easy cleaning

The general rule for selecting strainers for low viscosity, clean liquids is

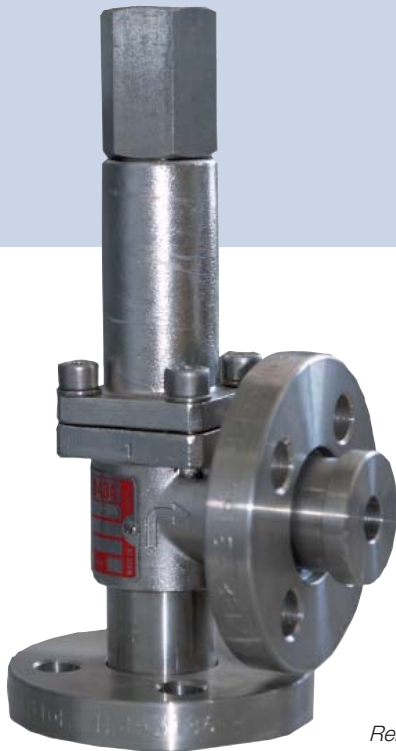
- Nominal pump suction pipe size = nominal strainer connection size

Installation

Strainers are installed in the –suction pipes of metering pumps. They must be fitted horizontally at an accessible point taking into account the flow direction (arrow).

With long suction pipes and wide diameters, isolation valves are recommended before and after the strainer.

Relief valves



Relief valves

Plunger and membrane pumps are positive displacement pumps, i.e. the delivered volume is independent of discharge pressure. A relief valve prevents a rise in pressure in excess of design values. The valve must be able to pass the maximum delivery volume without causing an increase of more than 10% above the maximum permissible pressure.

Standard designs

- Acid-resistant Cr-Ni-Mo steel.
Optional heating mantle.
Connections: DIN or ANSI flange, thread, compression fitting, food connection.
- Coated types.
Connections: DIN or ANSI flange.
- Plastic.
Connections: Adhesive connection, thread, DIN or ANSI flange.
Other materials available.

Applications

A relief valve must be used whenever there is the danger that an operational error such as a closed valve on the discharge side could cause the pressure to rise above the maximum permissible value and cause damage to the pump gear or pipe work.

Relief valves are also strongly recommended where nozzles are connected downstream, since there is the danger of blockage.

Pressure sustaining valves

These valves are fitted in the discharge pipe when the suction pressure is higher than the discharge pressure. A springloaded cone in the valve increases the discharge pressure and thus prevents the metered fluid from flowing through freely.

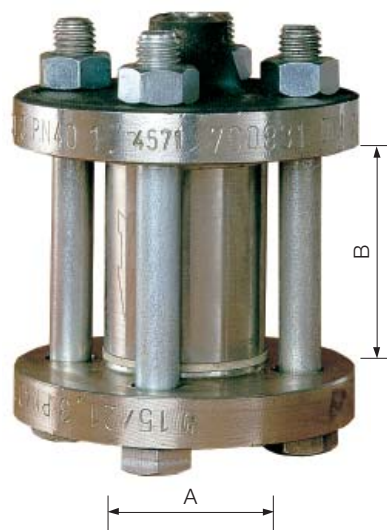
Pressure surges caused by inertial forces are also absorbed, thus preventing over-metering.

When fitted at the end of the discharge pipe, the pressure sustaining valve prevents the metered fluid from flowing out of the pipe when the pump is stopped.

When fitted as a non-return valve, it prevents the metered liquid from flowing backwards.

Standard designs

- Acid-resistant Cr-Ni-Mo steel with spring 1, 2, 4 or 6 bar. Heating jacket optional. Connections: installation between DIN or ANSI flanges, compression fittings, food connection.
- Plastic with spring 1 or 2 bar
Connections: Installation between flanges, adhesive joint for plastic pipe.
Other materials are available.



Connection	A	B
DN 15, PN 40	45	54
DN 25, PN 40	68	75
DN 32, PN 40	78	95
DN 40, PN 40	87	116
DN 50, PN 40	102	137
DN 65, PN 40	122	145
DN 80, PN 40	138	165

Injection points



Injection points

Injection points are used for adding small quantities of liquids to large flows.

They incorporate an injection pipe, shut-off valve and non-return valve.

Standard designs

- Nominal sizes DN 8 to DN 50 for pressures up to 400 bar
- Acid-resistant Cr-Ni-Mo steel
- Plastic (PVC or PP)
- Coated designs (rubber or PTFE)
- Special materials (Hastelloy or porcelain)

Modified designs are available for special applications such as sulphuric acid, hydrochloric acid and lime solution.

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