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Catalogue

MANKENBERG

Pressure Control Valves

Pressure Reducing Valves

Valve for Hygiene Applications | Ultrapure Media			DM 152
single-seat, angled design suitable for small and medium flow rates | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish possible up to Ra ≤ 0.25 µm | virtually pocket-free, is corrosion-resistant, lightweight and compact | elastomers as per FDA and USP Class VI, hygienic class HE5 | reduced preheating time for CIP/SIP procedures, less energy needed | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | TRI-CLAMP connections or DIN/ISO clamp connections | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 50	PN	2.5 - 10
p_1	up to 8 bar	p_2	0.3 - 5
K_{vs}	2 - 7 m^3/h	T	180 °C

Weight Loaded Pressure Reducing Valve			DM 3, 4
balanced straight-way valve for medium and very high flow rates | useable for liquids, gases and steam | body made of GGG-40 or GS-C 25 | high precision thanks to integral control behaviour | response time can be adjusted by damping			
DN	50 - 400	PN	16 - 40
p_1	up to 40 bar	p_2	0.5 - 10 bar
K_{vs}	32 - 1200 m^3/h	T	280 °C

Valve for High Pressures + High Temperature			DM 401
double-seat straight-way valve for high pressure and high temperature, high flow rates | usable for steam | body made of GS-C 25, GS 17 CrMo 55 | usable as soot blower with damping | especially sturdy, offers long maintenance intervals, a long operational lifespan			
DN	25 - 250	PN	16 - 100
p_1	up to 100 bar	p_2	1.5 - 32 bar
K_{vs}	6 - 360 m^3/h	T	500 °C

Valve for Hygiene Applications | Ultrapure Media			DM 462
double-seat angled valve for large flow rate | usable for liquids, gases, steam | completely made of deep-drawn CrNiMo steel (316L), surface finish possible up to Ra ≤ 0.25 µm | virtually pocket-free, corrosion- resistant, lightweight and compact | elastomers as per FDA and USP Class VI, hygienic class HE4 | reduced preheating time for CIP/SIP procedures, less energy needed | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | TRI-CLAMP connections or DIN/ ISO clamp connections, any other available on request | spring cap available with leakage line connection and adjusting screw seal			
DN	25 - 80	PN	2.5 - 10
p_1	up to 8 bar	p_2	0.3 - 5 bar
K_{vs}	4 - 70 m^3/h	T	180 °C

Valve for Hygiene Applications / Ultrapure Media			DM 462V
double-seat straight-way or angled valve for medium flow rate | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L), surface finish possible up to Ra ≤ 0.25 µm | virtually pocket-free, corrosionresistant, lightweight and compact | elastomers as per FDA and USP Class VI, hygienic class HE5 | reduced preheating time for CIP / SIP procedures, less energy needed | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | TRI-CLAMP connections or DIN/ ISO clamp connections, PTFE protective foil for diaphragms | can be actuated pneumatically | spring cap available with leakage line connection and adjusting screw seal			
DN	25	PN	2.5 - 16
p_1	8 bar	p_2	0.8 - 5 bar
K_{vs}	4 m^3/h	T	180 °C

Pressure Control Valves

Pressure Reducing Valves

Standard Valve			DM 502
single-seat straight-way valve for medium flow rate | usable for liquids and gases, in particular CO2 | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm, inner parts of brass | corrosion-resistant, very lightweight and compact | adjusting screw as a function of display, easy-to-maintain owing to the clamp system, many control ranges available | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
G	1/2 - 2	PN	100
p_1	up to 100 bar	p_2	0.02 - 16 bar
K_{vs}	0.6 - 4.2 m^3/h	T	130 °C

Valve for Small Flow Rates			DM 505
single-seat straight-way valve, inlet pressure up to 250 bar, also controls millibar ranges | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, various designs and connection types | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 25	G	1/2
PN	250	p_1	up to 250 bar
p_2	0.005 - 20 bar	K_{vs}	0.2 - 0.90 m^3/h
T	130 °C		

Valve for Steam Applications			DM 505Z
single-seat straight-way valve | inlet pressure up to 250 bar, also controls millibar ranges | usable for steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra			
DN	15 - 25	G	1/2
PN	250	p_1	up to 250 bar
p_2	0.005 - 12 bar	K_{vs}	0.2 - 0.9 m^3/h
T	200 °C		

High Pressure Valve for Medium Flow Rate			DM 510 - 518
single-seat straight-way valve for small to medium flow rates | highest pressures, up to 315 bar inlet pressure, high temperatures, also controls millibar ranges | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex, Hastelloy® or titanium available | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hardfaced valve cone and seat available for high pressure drops			
DN	15 - 50	G	3/8 - 2
PN	16 - 315	p_1	up to 315 bar
p_2	2 - 160 bar	K_{vs}	0.2 - 5.5 m^3/h
T	400 °C		

High Press. and Control Ranges lower than 2 bar			DM 512, 513, 517
single-seat straight-way valve for small to medium flow rates | highest pressures, up to 100 bar inlet pressure, high temperatures, also controls millibar ranges | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex, Hastelloy® or titanium available | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hardfaced valve cone and seat available for high pressure drops			
DN	15 - 50	G	3/8 - 2
PN	100	p_2	0.005 - 2 bar
K_{vs}	0.2 - 5.5 m^3/h	T	130 °C

Pressure Control Valves

Pressure Reducing Valves

Standard Cast Valve			DM 603
single-seat straight-way valve for high flow rates with balanced cone | highest temperatures up to 350 °C | usable for steam | body made of GS-C25 or CrNiMo-steel | steel / stainless steel, stainless-steel-diaphragm body, very precise thanks to a large number of different control ranges			
DN	15 - 150	PN	16 - 40
p_2	0.02 - 10 bar	K_{vs}	4 - 160 m^3/h
T	350 °C		

Standard Cast Valve			DM 604
single-seat straight-way valve for high flow rates with balanced cone | highest temperatures up to 250 °C | usable for steam | body made of GS-C25 or CrNiMo-steel | steel / stainless steel, stainless-steel-diaphragm body, very precise thanks to a large number of different control ranges | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 150	PN	16 - 40
p_2	0.02 - 10 bar	K_{vs}	4 - 160 m^3/h
T	250 °C		

Standard Cast Valve			DM 613
single-seat straight-way valve for high flow rates with balanced cone | for temperatures up to 130 °C | usable for liquids and gases | body made of GS-C25 or CrNiMo-steel | steel / stainless steel, stainless-steel-diaphragm body, very precise thanks to a large number of different control ranges | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 150	PN	16 - 40
p_2	0.02 - 10 bar	K_{vs}	4 - 160 m^3/h
T	130 °C		

High Pressure Valve, Medium and High Flow Rates			DM 620 - 628
single-seat straight-way valve for medium and high flow rates with balanced cone | highest pressures, up to 315 bar inlet pressure | usable for liquids and gases | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex, Hastelloy® or titanium are available | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hard-faced valve cone and seat available for high pressure drops | allows for the solution of most difficult procedural requirements with only one device			
DN	15 - 50	G	1/2 - 2
PN	16 - 315	p_1	up to 315 bar
p_2	2 - 160 bar	K_{vs}	0.4 - 10 m^3/h
T	200 °C		

Epoxy-coated Cast Valve for medium Flow Rates			DM 644
piston-controlled, single-seat straight-way valve with balanced cone for medium flow rates | usable for water, especially suitable for potable water | body made of GGG-50 with KTW-compliant epoxy coating | closed spring cap			
DN	50 - 150	PN	16 - 40
p_1	up to 40 bar	p_2	1.5 - 6 or 5 - 12 bar
K_{vs}	17 - 155 m^3/h	T	70 °C

Pressure Control Valves

Pressure Reducing Valves

Universal Valve			DM 652
single-seat straight-way valve with balanced cone for high flow rates | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | highest regulating accuracy thanks to a multitude of control ranges | various variants of convincing quality for your individual application | various connections and special versions available | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 50	G	1/2 - 2
PN	16 - 40	p_1	up to 40 bar
p_2	0.02 - 12 bar	K_{vs}	5 - 22 m^3/h
T	190 °C		

Universal Valve for Medium Flow Rate			DM 662
single-seat straight-way valve with balanced cone | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | highest regulating accuracy thanks to a multitude of control ranges | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 25	G	1/2 - 1
PN	100	p_1	up to 100 bar
p_2	0.02 - 12 bar	K_{vs}	3.2 - 3.6 m^3/h
T	130 °C		

Valve for Large Flow Rates			DM 664
single-seat straight-way valve with balanced cone | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, lightweight compared to its size, compact design | especially wellsuited for use with deionised water			
DN	50 - 100	PN	16
p_2	0.02 - 8 bar	K_{vs}	32 - 100 m^3/h
T	130 °C		

Pressure Regulating Hydrant Valve for Sea Water			DM 668E
all medium contact parts made of Titanium Grade 2 | extremely corrosion-resistant, lightweight and compact | combined shut-off and pressure reducing function | manageable installation, easy-to-maintain owing to the clamp system | especially suitable for sea water			
DN	40	PN	20/10
p_1	9 - 20 bar	P_2	6 - 8.5 bar
K_{vs}	14 m^3/h	T	50 °C

Piston-Controlled Mini Pressure Reducing Valve			DM 6901
single-seat straight-way valve for lowest flow rates, high pressures up to 300 bar | suitable for gases | medium wetted parts made of 316 stainless steel – surface quality ≤ 0,8 µm | corrosion-resistant and compact, smallest dimensions | a wide varity of designs and connection configurations | also available with pneumatic actuation			
G / NPT	1/8	p_2	0 - 100 bar
p_1	up to 300 bar	K_{vs}	0.05 m^3/h
C_{vs}	0.06 US gal/min.		

Pressure Control Valves

Pressure Reducing Valves

Diaphragm or Piston Controlled			DM 6902, 6904
single-seat straight-way valve for low flow rates, high pressures up to 300 bar | suitable for liquids and gases | body and spring cap made of 316 stainless steel - surface quality ≤ 0,8 µm | corrosion-resistant and compact | diaphragm made of Inconel X750 for maximum durability | a wide varity of designs and connection configurations			
G / NPT	1/4	p_2	0 - 35 bar (DM 6902) 0 - 180 bar (DM 6904)
p_1	up to 300 bar	K_{vs}	0.05 m^3/h
C_{vs}	0.06 US gal/min.		

Piston Controlled „Low flow" Pressure Reducer			DM 6914
single-seat straight-way valve for low flow rates, high pressures up to 550 bar | suitable for gases | body and spring cap made of 316 stainless steel - surface quality ≤ 0,8 µm | corrosion-resistant and compact | a wide varity of designs and connection configurations | optional with segregated captured vent			
G / NPT	1/4, 3/8	p_2	0 - 414 bar
p_1	up to 550 bar	K_{vs}	0.09 or 0.17 m^3/h
C_{vs}	0.1 or 0.2 US gal/min.		

Piston Controlled, with Ceramic Seat and Cone			DM 6916
single-seat straight-way valve for low flow rates, highest pressures up to 1380 bar | suitable for liquids | body and spring cap made of 316 stainless steel - surface quality ≤ 0,8 µm | corrosion-resistant and compact | with segregated captured vent | a wide varity of designs and connection configurations | also available with pneumatic actuation			
G / NPT	1/4 - 1/2	p_2	0 - 1380 bar
p_1	up to 1380 bar	K_{vs}	0.04 or 0.09 m^3/h
C_{vs}	0.05 or 0.1 US gal/min.		

Piston Controlled High Pressure Valve for Gases			DM 6917
single-seat straight-way valve for low flow rates, high pressures up to 690 bar | suitable for gases | body and spring cap made of 316 stainless steel - surface quality ≤ 0,8 µm | corrosion-resistant and compact | with segregated captured vent | a wide varity of designs and connection configurations | also available with pneumatic actuation			
G / NPT	1/4 - 1/2	p_2	0 - 690 bar
p_1	up to 690 bar	K_{vs}	0.09 m^3/h
C_{vs}	0.1 US gal/min.		

Valve for High Pressures for Small Flow Rates			DM 701
double-seat straight-way valve for high pressures and temperatures, small flow rates | usable for steam | body made of GS-C 25, C 22 N, 10 CrMo 9-10 | especially sturdy with long service intervals, long operational lifespan | optionally: integrated extension on the outlet side			
DN	15 - 50	PN	315
p_2	0.5 - 40 bar	K_{vs}	0.2 - 5.5 m^3/h
T	500 °C		

Pressure Control Valves

Pressure Reducing Valves

Millibar Control Valve			DM 762
single-seat straight-way valve for medium flow rates, especially for the control of millibar ranges | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosion-resistant, very lightweight and compact | very precise owing to large control surfaces and a large number of different control ranges, available in many different versions			
DN	15 - 50	G	1/2 - 2
PN	16	p_2	0.002 - 0.52 bar
K_{vs}	0.2 - 3.6 m^3/h	T	130 °C

Millibar Control Valve			DM 765
single-seat straight-way valve for small flow rates | suitable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosion resistant, very lightweight and compact, requires no external energy | long operational lifespan, manageable installation, easy-to-maintain owing to the clamp system, can be actuated pneumatically, a multitude of different versions and connection variants			
G	G 1/2	PN	16
p_2	0.03 - 0.8 bar	K_{vs}	0.2 m^3/h
T	130 °C		

Calculation of Pressure Regulators

Instruction

Designing and selecting pressure regulating valves is not a secret science mastered only by a handful of experts. The procedure described below allows the user to select a suitable valve for a particular application with relatively little effort. The calculations based on the so-called Kv value method have been considerably simplified compared with the very accurate calculations given in IEC 534; they produce, however, results which for our purposes are sufficiently accurate.

The K_v value is the flow coefficient which corresponds to a water flow rate -given in m^3/h- at a differential pressure of 1 bar and a water temperature between 5 and 30 °C.

The American system uses the flow coefficient Cv which corresponds to a water flow rate -given in USgal/min- at a pressure difference of 1 psi and a water temperature of 60 °F. The relationship between Kv and Cv is:
$K_v = 0{,}86 \times c_v$.

The Kvs value quoted in technical documentation is the K_v value at nominal valve lift for a specific series of valves. The K_{vs} value allows the maximum throughput to be calculated for a valve.

The methods of calculating the K_v value described here have been, as mentioned above, considerably simplified. Many factors have been excluded from the calculation. By treating steam as an ideal gas and excluding the specific volume, a maximum error of 5% may result which, however, in view of the allowances used, is acceptable.

The calculations are simple; a knowledge of basic arithmetic and finding roots is sufficient. Tables or diagrams are not absolutely necessary but can be helpful if available.

The operating pressures and setting ranges specified in our design examples are given as pressures above atmospheric [barg = bar], as is customary. The calculations, on the other hand, are based on absolute pressures [bara]. For instance, if an outlet pressure of 7 bar is specified an absolute pressure of 7 + 1 = 8 bara must be used in the calculation.

Flow rate and density should be specified for liquids in their operating state and for gases in their standard state (0°C, 1013 mbar).

Calculation of Pressure Regulators

Pressure Regulators for Liquids

Calculation of the K_v-value

To design or select a valve you should firstcalculate the K_v value from the operating data at which the valve is to operate

$$K_V = Q\sqrt{\frac{\rho}{1000 \cdot \Delta p}}$$

K_v	Flow Coeffficient	m³/h
Q	Volume Flow	m³
ρ	Density	kg/m³
p_1	Inlet Pressure (abs.)	bar
p_2	Outlet Pressure (abs.)	bar
Δp	Differential Pressure (p_1 - p_2)	bar

Example:
We are looking for a pressure reducing valve for 2-7 m3/h of methanol having a density of 790 kg/m3; the inlet pressure varies between 9 and 12 bar and the outlet pressure is to be maintained at 4 bar.
In our calculation we use the maximum flow rate and the minimum pressure drop

$$K_V = 7\sqrt{\frac{790}{1000 \cdot 5}} = 2{,}78 \text{ m}^3/\text{h}$$

To the K_v - value calculated from the operating data we add an allowance of 30 % and thus obtain the minimum Kvs - value which the valve should have

K_{vs} value ≥ 1.3 x K_v value = 1.3 x 2.78 = 3.61 m³/h

Calculating the nominal diameter

To keep pressure drop and noise within acceptable limits, certain flow velocities in the pipelines should not be exceeded e.g.

» suction side of centrifugal pumps	2 m/s
» suction side of reziprocating pumps	1 m/s
» delivery side of pumps	5 m/s
» local drinking water supplies	1 m/s
» water or fuel trunk pipelines	3 m/s
» high-viscosity liquids	1 m/s

Pipeline diameter can be calculated as follows

$$d = 18{,}8\sqrt{\frac{Q}{w}}$$

d	Pipeline Diameter	mm
Q	Volume Flow	m³/h
w	Flow Velocity	m/s

If in our Example we permit a maximum flow velocity of 2 m/s, the required pipeline diameter wil be

$$d = 18{,}8\sqrt{\frac{7}{2}} = 35{,}2$$

In this case we wouldselect a pipe of 40 mm nominal diameter (DN 40).

For a given pipeline diameter the flow velocity can be calculated as follows

$$w = 354\frac{Q}{d^2}$$

In our example the flow velocity for a DN 40 pipeline and a flow rate of 7 m³/h would be

$$w = 354\frac{7}{40^2} = 1{,}55 \text{ m/s}$$

For certain operating conditions a control valve may be selected whose nominal diameter is one or two sizes smaller than the nominal pipeline diameter; this applies especially to valves with sense line.

Selecting a suitable valve

Our selection tables and data sheets contain all the technical data needed to select MANKENBERG valves.
The K_{vs} value of the selected valve should be equal to the calculated K_v value plus the required allowance. Most valves operate most efficiently within 10 to 70 % of their K_{vs} values; small non-balanced valves such as our pressure reducers DM 502, 505, 506, 510, 762 and 765, will operate satisfactorily even at minimum flow rates.

You should select a setting range which places the required control pressure at the top end. If, for instance, the pressure to be controlled is 2.3 bar, you should select the 0.8-2.5 bar range rather than the 2-5 bar range, as with the latter the control errors would be considerably greater. If in special cases the standard setting range is not wide enough, a lower setting range may be selected provided the valve operates at low capacity and the control accuracy is of minor importance. Under such conditions, for instance, a pressure reducer featuring a setting range of 0.8-2.5 bar may still operate satisfactorily at 0.5 bar.

You should select the materials in accordance with the operating requirements by using the material resistance table.

Let us return to our example:
Based on the operating data we had calculated a minimum Kvs value of 3.61 m³/h. According to our selection table several valve types meet this requirement. In view of the properties of the fluid to be handled we select pressure reducer DM 652, DN 25, K_{vs} value 6 m3/h, setting range 2-5 bar, spring cap with leakage line connection. In its standard version this valve is manufactured from materials which are compatible with methanol. Additional features are high control accuracy, low weight, good surface quality and a price which is remarkably low for a stainless steel valve.

Here is another example:
We are looking for a overflow valve (back pressure regulator) capable of discharging 250 m³/h of drinking water into an open reservoir at a pressure of 10 bar. First we calculate the KV value corresponding to the operating data. Although the pressure drop (p1 - p2) is 10 bar, we shall use for our calculation a pressure drop of only 0.6 x p1 [bara] = 6.6 bar because of the evaporation which occurs across the valve.
Thus:

$$K_V = 250\sqrt{\frac{1000}{1000 \cdot 6{,}6}} = 97{,}3 \text{ m}^3/\text{h}$$

Hence the K_{vs} value of the valve should be at least

K_{vs} value = 1.3 x K_v value = 1.3 x 97.3 = 126.5 m³/h

We select the pilot operated overflow valve UV 824, DN 200, K_{vs} value 180 m³/h, setting range 4–12 bar, a relatively economical, lightweight and very accurate control valve made from steel or better stainless steel.

Let us give another example:
We are looking for a CIP pressure reducing valve capable of reducing the pressure of demineralized water from 2-4 bar to 0.7 bar at a rate of 1-3 l/min. The pipeline has a nominal diameter of 25 mm and Tri Clamp connection.
Based on the operating data we again calculate the K_v value as follows:

$$K_V = 0.003 \times 60\sqrt{\frac{1000}{1000 \cdot 1.3}} = 0.16 \text{ m}^3/\text{h}$$

Hence the K_{vs} value of the valve should be at least

K_{vs} value = 1.3 x K_v value =1.3 x 0.16 = 0.21 m³/h

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Potravinářský průmysl
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Úprava vody
Papírenství a zpracování celulózy
Plynárenský průmysl
Keramický průmysl
Zpracovatelský průmysl

Firma s tradicí od r. 1990 se při svém vzniku zaměřila na dodávky základních komponent, přístrojové a měřící techniky a dodávky technologií pro farmaceutický a potravinářský průmysl. Cílem bylo zajistit kompletní dodavatelsko - inženýrské služby, včetně servisu. V roce 1998, který byl pro firmu velmi významným mezníkem, proběhla transformace společnosti do nynější formy. V dalších letech činnosti společnosti dochází k rozšíření portfolia a je navazována spolupráce s partnery v oblasti armatur, komponent, ventilů, procesní měřící techniky a čerpadel.

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Calculation of Pressure Regulators

We select the pressure reducer DM 152, DN 25, K_{vs} value 3.5 m^3/h, setting range 0.8-2.5 bar, an angled stainless steel valve which can be polished. We have selected this valve, although its Kvs value is relatively high and the required outlet pressure is outside the specified setting range, because extensive bench testing has shown that this valve is ideal for the above-mentioned operating conditions.

We have used this example to demonstrate that in special cases valves can be used outside the parameter ranges specified in the catalogue provided that the user has a good knowledge of the operating characteristics of the valve.

Pressure Regulators for Gas

Calculation of the K_v value

The selection of a valve first of all that the K_v value is determined from the operating data under which the valve is to operate.
For subcritical pressure drops, i.e. if

$$\Delta p < \frac{p_1}{2}$$

use formula

$$K_V = \frac{Q_N}{514}\sqrt{\frac{\rho_N(t_1+273)}{\Delta p \times p_2}}$$

or for supercritical pressure drops, i.e. if

$$\Delta p > \frac{p_1}{2}$$

use formular

$$K_V = \frac{Q_N}{257 \times p_1}\sqrt{\rho_N(t_1+273)}$$

K_v	Flow Coefficient	m^3/h
Q_N	Volume Flow	m^3/h
Q_1	Volume Flow Upstream of the Valve	m^3/h
Q_2	Volume Flow Downstream of the Valve	m^3/h
ρ_N	Density in standard condition	kg/m^3
Δp	Differential Pressure (p_1 - p_2)	bar
p_1	Inlet Preessure (abs.)	bar
p_2	Outlet Pressure (abs.)	bar
t_1	Temperature at Inlet	°C
t_2	Temperature at Outlet	°C
w_1	Velocity inside Pipeline before the Valve	m/s
w_2	Velocity inside Pipeline behind the Valve	m/s
d_1	Nominal Diameter before the Valve	mm
d_2	Nominal Diameter behind the Valve	mm

We are looking for a stainless steel pressure reducing valve for Q_N max. 1200 m^3/h CO_2, operating temperature 20 °C, density 2 kg/m^3, inlet pressure 10-12 bar above atmospheric, controlled outlet pressure 7 bar above atmospheric.
The pressure drop is subcritical, as

$$\Delta p < \frac{p_1}{2} \quad \text{namely} \quad 3 < \frac{11}{2}$$

Hence

$$K_V = \frac{1200}{514}\sqrt{\frac{2(20+273)}{3\times 8}} = 11{,}54\ m^3/h$$

To the K_v value calculated from the operating data we add an allowance of 30 % and thus obtain the minimum K_v value which the valve to be selected should have.

K_{vs} value ≥ 1.3 K_v value = 1.3 x 11.54 = 15 m^3/h

Calculating the Nominal Diameter

To keep pressure drop and noise within acceptable limits, certain flow velocities in the pipelines should not be exceeded.

» up to 10 mbar	2 m/s
» up to 100 mbar	4 m/s
» up to 1 bar	10 m/s
» up to 10 bar	20 m/s
» above 10 bar	40 m/s

If no values have been specified we recommend the following:
These rough guidelines apply to pipe diameters from DN 80 up. For smaller diameters lower flow velocities should be used.
To calculate the flow velocity we need the flow rate figure under operating conditions. This may be calculated as follows:

$$Q = \frac{Q_N(273+t)}{p \times 273}$$

Accordingly in our example the flow rates upstream and downstream of the valve are as follows:

$$Q_1 = \frac{1200(273+20)}{11\times 273} = 117{,}1\ m^3/h \qquad Q_2 = \frac{1200(273+20)}{8\times 273} = 161\ m^3/h$$

The pipeline diameter can be calculated as follows:

$$d = 18{,}8\sqrt{\frac{Q}{w}}$$

If in our example maximum flow velocities of 20 m/s upstream and 15 m/s downstream of the valve have been specified, the following pipeline diameters will be required

$$d_1 = 18{,}8\sqrt{\frac{117{,}1}{20}} = 45{,}5\ mm \qquad d_2 = 18{,}8\sqrt{\frac{161}{15}} = 59{,}6\ mm$$

Consequently we would recommend a DN 50 pipeline upstream and a DN 65 pipeline downstream of the valve.

For a given nominal diameter the flow velocity can be calculated as follows

$$w = 354\frac{Q}{d^2}$$

In our example we would thus obtain the following flow velocities

$$w_1 = 354\frac{117{,}1}{50^2} = 16{,}6\ m/s \qquad w_2 = 354\frac{161}{65^2} = 13{,}5\ m/s$$

For certain operating conditions a control valve may be selected whose nominal diameter is one or two sizes smaller than the nominal pipeline diameter. Downstream of the valve the pipeline diameter may be increased by one or two sizes depending on the flow velocity; this applies especially to valves with sense line.

Calculation of Pressure Regulators

Selecting a suitable valve

Our selection tables and data sheets contain all the technical data needed to select MANKENBERG valves.
The K_{vs} value of the selected valve should be equal to the calculated K_v value plus the required allowance. Most valves operate most efficiently within 10 to 70 % of their K_{vs} values; small non-balanced valves such as our pressure reducers DM 502, 505, 506, 510, 762 and 765, will operate satisfactorily even at minimum flow rates.

You should select a setting range which places the required control pressure at the top end. If, for instance, the pressure to be controlled is 2.3 bar, you should select the 0.8-2.5 bar range rather than the 2-5 bar range, as with the latter the control errors would be considerably greater. If in special cases the standard setting range is not wide enough, a lower setting range may be selected provided the valve operates at low capacity and the control accuracy is of minor importance. Under such conditions, for instance, a pressure reducer featuring a setting range of 0.8-2.5 bar may still operate satisfactorily at 0.5 bar.

You should select the materials in accordance with the operating requirements by using the material resistance table.

If toxic or flammable fluids are to be handled a sealed spring cover – possibly with sealed setting screw - should be used and a leakage line connection (threaded connection at spring cover) provided so that any fluid leaking as a result of a defective control mechanism can be drained safely.

Let us return to our example:
Based on the operating data we had calculated a minimum K_{vs} value of 15 m³/h. According to our selection table several valve types meet this requirement. We select pressure reducer DM 652, DN 50, K_{vs} value 18 m³/h, setting range 4-8 bar. In its standard version this valve is manufactured from materials which are suitable for the application. Additional features are high control accuracy, low weight, good surface quality and a price which is remarkably low for a stainless steel valve.

Let us take another example:
We are looking for an overflow valve capable of discharging 2000 m³/h of 60°C warm air to atmosphere at 4 bar.

The pressure drop is supercritical because

$$\Delta p > \frac{p_1}{2} \quad \text{namely } 4 > \frac{5}{2}$$

Hence

$$K_V = \frac{2000}{257 \times 5}\sqrt{1{,}293 \times (60+273)} = 32{,}3 \text{ m}^3/\text{h}$$

To the K_v value calculated from the operating data we add an allowance of 30 % and thus obtain the minimum K_{vs} value which the valve should have.

K_{vs} value ≥ 1.3 x K_v value = 1.3 x 32.3 = 42 m³/h

The flow rate under operating conditions is

$$Q_1 = \frac{2000(273+60)}{5 \times 273} = 488 \text{ m}^3/\text{h}$$

and accordingly, given a maximum permitted flow velocity of 20 m/s, the minimum pipeline diameter is

$$d_1 = 18{,}8\sqrt{\frac{488}{20}} = 93 \text{ mm}$$

On the basis of the calculated data and taking into account the properties of the medium, we select the MANKENBERG overflow valve UV 4.1, DN 100, K_{vs} value 100 m³/h, setting range 2-5 bar; a relatively economical and accurate valve very suitable for the application.

Pressure Regulators for Steam

Calculation of th K_v value

The selection of a valve requires first of all that the K_v value is determined from the operating data under which the valve is to operate. As in most cases a table or diagram giving the specific volume of steam is not available, the formulae given below, which treat steam as an ideal gas, can be used to arrive at a sufficiently accurate result.

For subcritical pressure drops i.e. if

$$\Delta p < \frac{p_1}{2}$$

use formula

$$K_V = \frac{G}{461}\sqrt{\frac{t_1+273}{\Delta p \times p_2}}$$

or for supercritical pressure drops, i.e. if

$$\Delta p > \frac{p_1}{2}$$

use formula

$$K_V = \frac{G}{230 \times p_1}\sqrt{t_1+273}$$

The temperature of steam in its saturated state (saturated steam) may be roughly calculated using the formula

$$t_s \approx \sqrt[4]{p_1} \text{ x } 100$$

K_v	Flow Coeffizient	m³/h
G	Mass Flow	kg/h
Q_1	Volume Flow Upstream of the Valve	m³/h
Q_2	Volume Flow Downstream of the Valve	m³/h
Δp	Differential Pressure (p_1 - p_2)	bar
p_1	Inlet Pressure (abs.)	bar
p_2	Outlet Pressure (abs.)	bar
t_1	Temperature at Inlet	°C
t_2	Temperature of Saturated Steam	°C
w_1	Velocity Inside of the Pipeline before the valve	m/s
w_2	Velocity Inside of the Pipeline behind the valve	m/s
d_1	Nominal Diameter before the Valve	mm
d_2	Nominal Diameter behind the Valve	mm

Example:
We are looking for a stainless steel pressure reducing valve capable of reducing the pressure of 1100 kg/h of saturated steam from 7 to 4 bar.
The pressure drop is subcritical because

$$\Delta p < \frac{p_1}{2} \quad \text{namely } 3 < \frac{8}{2}$$

As we do not know either the specific volume nor the temperature, we use the formula

$$K_V = \frac{G}{461}\sqrt{\frac{t_1+273}{\Delta p \times p_2}}$$

Having calculated the temperature

$$t_s \approx \sqrt[4]{p_1} \text{ x } 100 = \sqrt[4]{8} \text{ x } 100 = 168 \text{ °C}$$

Calculation of Pressure Regulators

we calculate

$$K_V = \frac{1100}{461}\sqrt{\frac{168+273}{3\times5}} = 12{,}9\ m^3/h$$

To the K_{vs} value calculated from the operating data we add an allowance of 30 % and thus obtain the minimum K_{vs} value which the valve to be selected should have

K_{vs} value ≥ 1.3 x K_v value = 1.3 x 12.9 = 16.8 m^3/h

Calculating the nominal diameter

To keep pressure drop and noise within acceptable limits, certain flow velocities in the pipelines should not be exceeded. If no values have been specified we recommend the following:

- » Exhaust steam 25 m/s
- » Saturated steam 40 m/s
- » Super heated steam 60 m/s

These rough guidelines apply to pipe diameters from DN 80 up. For smaller diameters lower flow velocities should be used. As in most cases the specific volume is not known, we use the following sufficiently accurate formula to calculate the volume:

$$Q = \frac{G\times(t+273)}{p\times219}$$

Accordingly in our example the flow rates upstream and downstream of the valve are as follows

$$Q_1 = \frac{1100(168+273)}{8\times219} = 277\ m^3/h \qquad Q_2 = \frac{1100(168+273)}{5\times219} = 443\ m^3/h$$

Pipeline diameter can be calculated using following formula

$$d = 18{,}8\sqrt{\frac{Q}{w}}$$

If in our example a maximum flow velocity of 25 m/s before the valve and of 15 m/s behind the valve has been specified, the required pipeline diameters will be as follows:

$$d_1 = 18{,}8\sqrt{\frac{277}{25}} = 63\ mm \qquad d_2 = 18{,}8\sqrt{\frac{443}{25}} = 79\ mm$$

We would therefore recommend pipes DN 65 upstream and pipes DN 80 downstream of the valve.

For a given nominal diameter the flow velocity can be calculated as follows:

$$w = 354\frac{Q}{d^2}$$

In our example the flow velocities in the pipeline would be

$$w_1 = 354\frac{277}{65^2} = 23\ m/s \qquad w_2 = 354\frac{443}{80^2} = 24\ m/s$$

For certain operating conditions a control valve may be selected whose nominal diameter is one or two sizes smaller than the nominal pipeline diameter. Downstream of the valve the pipeline diameter may be increased by one or two sizes depending on the flow velocity; this applies especially to valves designed for sense line operation.

Selecting a suitable valve

Our selection tables and data sheets contain all the technical data needed to select MANKENBERG valves.
The K_{vs} value of the selected valve should be equal to the calculated K_v value plus the required allowance. Most valves operate most efficiently within 10 to 70 % of their K_{vs} values; small non-balanced valves such as our pressure reducers DM 152, 505 and 701, will operate satisfactorily even at minimum flow rates.

You should select a setting range which places the required control pressure at the top end. If, for instance, the pressure to be controlled is 2.3 bar, you should select the 0.8-2.5 bar range rather than the 2-5 bar range, as with the latter the control errors would be considerably greater. If in special cases the standard setting range is not wide enough, a lower setting range may be selected provided the valve operates at low capacity and the control accuracy is of minor importance. Under such conditions, for instance, a pressure reducer featuring a setting range of 0.8-2.5 bar may still operate satisfactorily at 0.5 bar.

You should select the materials in accordance with the operating requirements by using the material resistance table.

Let us return to our example:
Based on the operating data we had calculated a minimum K_{vs} value of 16.8 m^3/h. According to our selection table several valve types meet this requirement. We select pressure reducer type 652, DN 50, K_{vs} value 18 m^3/h, setting range 2-5 bar. In its standard version this valve is manufactured from materials which are suitable for the application. Additional features are high control accuracy, low weight, good surface quality and a price which is remarkably low for a stainless steel valve.

Here is another example:
We are looking for a pressure reducing valve capable of reducing the pressure of 8 t/h of 460°C superheated steam from 100 bar to 20 bar for the purpose of soot blowing.

The pressure drop is supercritical because

$$\Delta p > \frac{p_1}{2} \quad \text{namely } 80 > \frac{101}{2}$$

As we do not know the specific volume at the moment, we calculate

$$K_V = \frac{8000}{230\times101}\sqrt{460+273} = 9{,}33\ m^3/h$$

To the K_v value calculated from the operating data we add an allowance of 30 % and thus obtain the minimum K_{vs}-value which the valve to be selected should have.

K_{vs} value ≥ 1.3 K_v value = 1.3 x 9.33 = 12.1 m^3/h

Under operating conditions the volume flow rates are

$$Q_1 = \frac{8000(460+273)}{101\times219} = 265\ m^3/h \qquad Q_2 = \frac{8000(460+273)}{21\times219} = 1275\ m^3/h$$

Pipeline diameter can be calculated using following formula:

$$d = 18{,}8\sqrt{\frac{Q}{w}}$$

If in our example a maximum permitted flow velocity of 50 m/s has been specified, the required pipeline diameter will be as follows:

$$d_1 = 18{,}8\sqrt{\frac{265}{50}} = 43{,}3\ mm \qquad d_2 = 18{,}8\sqrt{\frac{1275}{50}} = 94{,}5\ mm$$

Consequently we would recommend a DN 50 pipeline up-stream and a DN 100 pipeline downstream of the valve.

Using the calculated data and taking into account the special operating conditions, we select the twin seat pressure reducer type 401 ZK, DN 50/80, K_{vs} value 16 m^3/h, setting range 15-25 bar, complete with adjustable damper unit and stellited cones - a design which has proved reliable in many soot blowing systems.

Know How Pressure Reducing Valves

Pressure reducing valves reduce a high and frequently fluctuating pressure to an adjustable constant pressure downstream of the valve. A spring keeps the valve open and this closes as the outlet pressure rises.

Selecting valve type and nominal diameter
Using your maximum operating data and the smallest differential pressure Δp, you should calculate the characteristic performance figure K_v (see leaflet Calculation of Pressure Regulators). Select a valve whose K_{vs} value is 30% greater than the calculated K_v figure. Additional allowances must be made for high-viscosity liquids or liquids which vaporise when depressurised.
You should also note the reduction ratio i.e. inlet pressure p_1 divided by outlet pressure p_2. The inlet pressure acting on the cone causes the valve to open whereas the outlet pressure acting on the diaphragm/spring system causes it to close. If the reduction ratio calculated from the operating data is greater than the quoted ratio, the valve will not close. Pressure reducing valves should not be overdimensioned. Their optimum working range is within 10% to 70% of their K_{vs} value.

Selecting rated pressure and valve material
The rated pressure must exceed the maximum system pressure, irrespective of safety allowances. Please note also the effect of the temperature (see DIN 2401).

Selecting the setting range
For good control accuracy you should select a setting range which places the required outlet pressure near its upper limit. If, for example, the controlled outlet pressure is to be 2.3 bar, you should select the 0.8 to 2.5 bar setting range, not 2 to 5 bar. If the available setting range is not wide enough you may go below the bottom limit of the setting range provided that the valve loading is kept low and a high control accuracy not required.

Selecting elastomer materials
You should select elastomers according to the operating temperature and the requirements of the medium. High-pressure gases, for example, can diffuse into the elastomer and cause damage when being depressurised.

Flow velocity
Depending on pressure drop and permitted maximum noise level, we recommend the following flow velocities:

Liquids	1	-	5	m/s
Saturated steam	10	-	40	m/s
Superheated steam	15	-	60	m/s
Gases below 2 bar	2	-	10	m/s
Gases above 2 bar	5	-	40	m/s

Sense line (control line)
You should install a sense line if the selected pressure reducer is designed for sense line operation. The sense line should be connected at a distance of not less than 10 times nominal diameter downstream of the pressure reducing valve. No isolating valves should be installed in the sense line to avoid an excessive pressure differential between valve body and diaphragm.
To attenuate any oscillations occurring in the pipeline system, the sense line may be fitted with a restrictor which must never be fully closed during operation.
In the case of steam and liquids the sense line must be installed so as to fall towards the valve. Under special operating conditions, for example intermittent operation with dry steam, an compensation vessel must be installed. The sense line must be rigid as elastic hoses can induce oscillations.

Protecting your system
To protect your system you should install a safety valve downstream of the pressure reducer to prevent the maximum permitted operating pressure (normally 1.5 x maximum set pressure) being exceeded. The safety valve operating pressure should be set approximately 40% above the maximum set pressure of the pressure reducer to avoid blow-off during slight pressure fluctuations. For example: if the pressure reducer setting range is 2 - 5 bar the safety valve operating pressure must be 1.4 x 5 bar = 7 bar.

Protecting the pressure reducing valve
To protect the pressure reducer against damage from solid particles carried in the pipeline, a strainer or filter should be fitted and serviced at regular intervals.
With steam as medium, the pressure reducer should be preceded by a water trap, which is also called steam dryer, to protect it from cavitation (see below chapter "Steam Operation").

Valve seat leakage
Pressure reducers are control valves which are not required to provide a leak-proof seal (VDI/VDE Guideline 2174). Normally pressure reducers leave the factory with perfectly leakproof valve seats. During operation, however, solid particles often cause damage and seat leakage. Any low leakage requirement must be expressly specified when ordering. Valve leakage can be considerably reduced by special measures such as lapping the valve seat, using special cone seals and increasing the control (diaphragm) surfaces.

Cut-off
For the purpose of installation, servicing and isolation of the valve, shut-off valves should be installed upstream and downstream of the pressure reducer. When closing the shut-off valves the upstream valve must always be closed first. A bypass line may be necessary to maintain emergency operation.

Stellited seat and cone
In the case of abrasive media or liquids with pressure drops (inlet pressure minus outlet pressure) of more than 25 bar the valve cone must be stellited; for pressure drops above 150 bar the seat must be stellited as well.

Leakage line
If toxic or hazardous media are used the valve must feature a sealed spring cap (including setting spindle seal) fitted with a leakage line connection. When the pressure reducer is installed on site a leakage line must be fitted capable of safely and pressureless draining the escaping medium in case the control valve should become defective.

Mounting position
For gases a pressure reducing valve can normally be fitted in horizontal pipelines with the spring cap at the bottom or at the top. Installation in vertical pipe runs is possible but can result in increased wear and loss of control accuracy owing to increased friction. In the case of liquids a pressure reducer should be installed with the spring cover at the bottom. Thus gas traps upstream of the valve are avoided which would cause the valve to oscillate. For steam a pressure reducer should likewise be installed with its spring cover at the bottom to protect the diaphragm against overheating by means of a layer of condensate.

Start-up
Pressure reducers should be started up and operated without pressure surges, if possible. A sudden operation of upstream or downstream valves should be avoided.

Steam operation
If a pressure reducer is installed in a steam plant the diaphragm water reservoir must be filled before the plant is started up. There must be no danger of overheating at the installation site caused by excessive ambient temperatures or insufficient heat dissipation. Pressure regulators must not be insolated. In some cases an insulating of the body is permitted, but only with cast bodies. Never insulate diaphragm housing, mid section and spring cap (or open springs). Overheating caused by insulating destroys the elastomere of the control unit.
Many steam generators send a lot of water through the piping together with the steam. Even an initial overheating can get lost through piping heat losses, so that the steam gets "wet". A piping speed of up to 25 m/s is normal for "dry steam", whilst wet steam already has the effect of a sandblasting machine at this speed, and the condensate and/or the water droplets eat holes into pipings and valve seats. In addition, water obstructs heat transition especially in heat exchangers. To avoid it, the water should be removed by a water trap, also called steam dryer, as quickly as possible and without steam losses.

Know How Pressure Reducing Valves

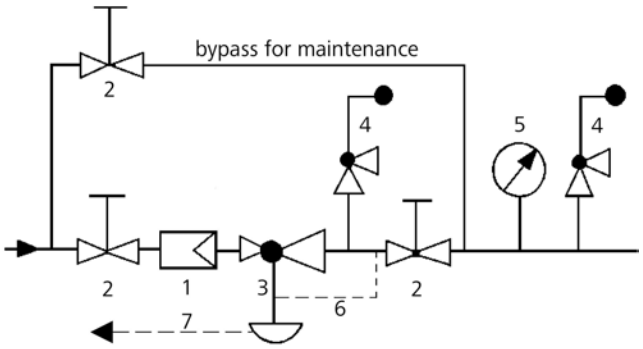
Pressure reducing valves reduce a high and frequently fluctuating pressure to an adjustable constant pressure downstream of the valve. A spring keeps the valve open and this closes as the outlet pressure rises.

Setting the pressure
Pressure reducing valves are normally supplied by us with a relaxed spring. This means that a valve is set at the factory to the minimum outlet pressure. The required pressure should be set under operating conditions.

Maintenance
Pressure reducers must be cleaned and serviced regularly.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

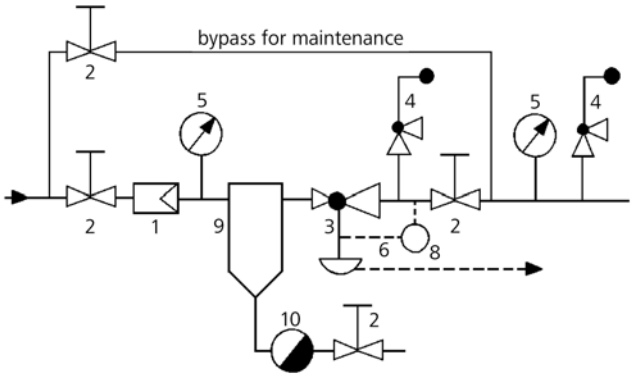
Recommended installation for liquids and gasses



1 Strainer or Filter
2 Shutoff Valves
3 Pressure Reducer
4 Safety Valve
5 Pressure Gauge
6 Sense Line
7 Leakage Line

Sense Line Connection 10 - 20 x DN behind the valve

Recommended installation for steam



1 Strainer
2 Shutoff Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line
7 Leakage Line
8 Expansion Tank
9 Water Trap (Steam Dreyer)
10 Steam Trap

Sense line connection 10 - 20 x DN behind the valve

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, Operating Instruction etc. MUST be followed.

Selection Pressure Reducing Valves

MANKENBERG

for steam

PN	outlet press. bar	T °C	K_{vs}-value m^3/h	connection G	connection DN	*	SS	Notes	type
10	0.3 - 5	180	2 - 7		15 - 50	*	•	CIP, SIP, elbow design, electropolished available	152
10	0.3 - 5	180	4 - 70		25 - 80	*	•	CIP, SIP, globe or elbow design, electropolished available	462
16	0,3 - 5	180	4		25	*	•	CIP, SIP, globe or elbow design, electropolished available	462V
40	0.02 - 10	350	4 - 160		15 - 150			standard steam valve	603
40	0.02 - 10	250	4 - 160		15 - 150			the most economical steam valve	604
40	0.02 - 12	190	5 - 22	1/2 - 2	15 - 50	*	•	our most popular valve, can be used anywhere, also for clean steam	652
40	0.5 - 10	280	32 - 1200		50 - 400			large flow rates, weight loaded, high acuracy	3 / 4
250	0.005 - 12	200	0.2 - 0.90	1/2	15 - 25	*	•	small flow rates, sterile applications	505Z
250	1.5 - 32	500	6 - 360		25 - 250			large flow rates, high temperatures, high pressures	401/402
315	0.5 - 40	500	0.2 - 5.5		15 - 50			small flow rates, high temperatures, high pressures	701

for liquids

PN	outlet press. bar	T °C	K_{vs}-value m^3/h	connection G	connection DN	*	SS	notes	type
10	0.3 - 5	180	2 - 7		15 - 50	*	•	CIP, SIP, elbow design, electropolished available	152
10	0.3 - 5	180	4 - 70		25 - 80	*	•	CIP, SIP, globe or elbow design, electropolished available	462
16	0.002 -0.52	130	0.2 - 3.6	1/2 - 2	15 - 50	*	•	low pressure regulator	762
16	0.03 - 0.8	130	0.2	1/2		*	•	low pressure regulator, laboratory application	765
16	0,8 - 5	180	4		25	*	•	CIP, SIP, globe or elbow design, electropolished available	462V
16	0.02 - 8	130	32 - 100		50 - 100	*	•	economical stainless steel valve	664
25	1.5 - 15	70	40 - 1400		50 - 400			for drinkingwater, epoxy coated, pilot controlled	115
25	1 - 20	130	60 - 2100		100-800			large flow rate, inline-valve, pilot controlled	814/815
40	0.02 - 10	130	4 - 160		15 - 150			economical valve with cast body	613
40	0,02 - 12	190	5 - 22	1/2 - 2	15 - 50	*	•	our most popular valve, can be used anywhere	652
40	1,5 - 12	70	17 - 155		50 - 150			for drinkingwater, epoxy coated, piston controlled	644
40	0.5 - 10	280	32 - 1200		50 - 400			large flow rate, weight loaded, high acuracy	3 / 4
100	0.02 - 12	130	3.2 - 3.6	1/2 - 1	15 - 25	*	•	if DM 505 is too small and DM 652 too big	662
100	0.02 - 16	130	0.6 - 4.2	1/2 - 2		*	•	economical stainless steel valve, inner parts made of brass	502
160	1 - 40	130	20 - 70		40 - 150			large flow rate, pilot controlled	810Eck
160	1 - 40	130	20 - 900		40 - 400			large flow rate, pilot controlled	810
250	0.005 - 20	130	0.2 - 0.9	1/2	15 - 25	*	•	for small flow rates, also for sterile applications	505
315	0.005 - 160	400	0.2 - 5.5	3/8 - 2	15 - 50	*		high pressure valves	510 - 518
315	2 - 160	200	0,4 - 10	1/2 - 2	15 - 50	*		high pressure valves, balanced	620 - 628

for gases

PN	outlet press. bar	T °C	K_{vs}-value m^3/h	connection G	connection DN	*	SS	notes	type
10	0.3 - 5	180	2 - 7		15 - 50	*	•	CIP, SIP, elbow design, electropolished available	152
10	0.3 - 5	180	4 - 70		25 - 80	*	•	CIP, SIP, globe or elbow design, electropolished available	462
16	0.002 - 0.52	130	0.2 - 3.6	1/2 - 2	15 - 50	*	•	low pressure regulator, tank blanketing	762
16	0.03 - 0.8	130	0.2	1/2		*	•	low pressure regulator, laboratory application	765
16	0,8 - 5	180	4		25	*	•	CIP, SIP, globe or elbow design, electropolished available	462V
16	0.02 - 8	130	32 - 100		50 - 100	*	•	economical stainless steel valve	664
25	1 - 20	130	60 - 2100		100-800			large flow rate, inline-valve, pilot controlled	814/815
40	0.02 - 10	130	4 - 160		15 - 150			economical valve with cast body	613
40	0.02 - 12	190	5 - 22	1/2 - 2	15 - 50	*	•	our most popular valve, can be used anywhere	652
40	0.5 - 10	280	32 - 1200		50 - 400			large flow rates, weight loaded, high acuracy	3 / 4
40	1,5 - 12	70	17 - 155		50 - 150			piston controlled, epoxy coated, for harmless gases	644
100	0.02 - 12	130	3.2 - 3.6	1/2 - 1	15 - 25	*	•	if DM 505 is too small and DM 652 too big	662
100	0.02 - 16	130	0.6 - 4.2	1/2 - 2		*	•	economical stainless steel valve, inner parts made of brass	502
100	0.02 - 12	130	0.15 - 3.6	1/2 - 2	15 - 50	*	•	for high purity applications	505P
160	1 - 40	130	20 - 70		40 - 150			large flow rates, pilot controlled	810Eck
160	1 - 40	130	20 - 900		40 - 400			large flow rates, pilot controlled	810
250	0.005 - 20	130	0.2 - 0.9	1/2	15 - 25	*	•	for small flow rates, also for sterile applications	505
315	0.005 - 160	400	0.2 - 5.5	3/8 - 2	15 - 50	*		high pressure valves	510 - 518
315	2 - 160	200	0,4 - 10	1/2 - 2	15 - 50	*		high pressure valves, balanced	620 - 628

* other connections available, • stainless steel deep drawn

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pressure Control Valves

Pressure Reducing Valves DM 152

Valve for Hygiene Applications | Ultrapure Media

Technical Data

Connection DN	15 - 50
Nominal Pressure PN	2.5 - 10
Inlet Pressure	up to 8 bar
Outlet Pressure	0.3 - 5
K_{vs}-Value	2 - 7 m^3/h
Temperature	180 °C
Medium	liquids, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 152 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve which is primarily used for hygienic applications in the food processing and pharmaceutical industries. A PTFE protective foil renders the diaphragm physiologically safe and steamproof up to 180 °C. The valve does not require an external pilot line.

This valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. It contains virtually no dead pockets and is suitable for use in CIP and SIP systems. The angled design allows complete draining.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- non rising adjusting screw
- quick-release body clamp ring

Options

- polished version for food, pharmaceutical and superclean applications surface roughness Ra ≤ 0.25 oder 0.4 oder 0.8 µm
- diaphragm protected by PTFE foil
- soft seal
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.

Pressure Control Valves

Pressure Reducing Valves DM 152

Valve for Hygiene Applications | Ultrapure Media

We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]						
nom. diam. DN	15	20	25	32	40	50
K_{vs}-value m^3/h	2	3	4	5	6	7

Setting Ranges [bar] and Nominal Pressure PN			
outlet press. bar	1 - 5	0.8 - 2.5	0.3 - 1.1
PN	10 / 10	10 / 6	10 / 2.5

Pressure Control Valves

Pressure Reducing Valves DM 152

Valve for Hygiene Applications | Ultrapure Media

Materials	
Body, Spring Cap, Internals	CrNiMo-steel
Spring	CrNi-steel
Valve Seal	optional soft seal
Diaphragm	FPM
Protection Foil (for diaphragm)	PTFE

Dimensions [mm]

pressure range [bar]	size	nominal diameter DN					
		15	20	25	32	40	50
0.8 - 2.5 2 - 5	AE_1	90	90	90	120	120	120
	AE_2	90/100/110 *		90	120	120	120
	C	200	200	200	200	200	200
	D	138	138	138	138	138	138

* dimensions can vary according to type of connection, please inquire

Dimensions [mm]

pressure range [bar]	size	nominal diameter DN					
		15	20	25	32	40	50
0.3 - 1.1	AE_1	120	120	120	120	120	120
	AE_2	120/140 *		120	120	120	120
	C	200	200	200	200	200	200
	D	200	200	200	200	200	200

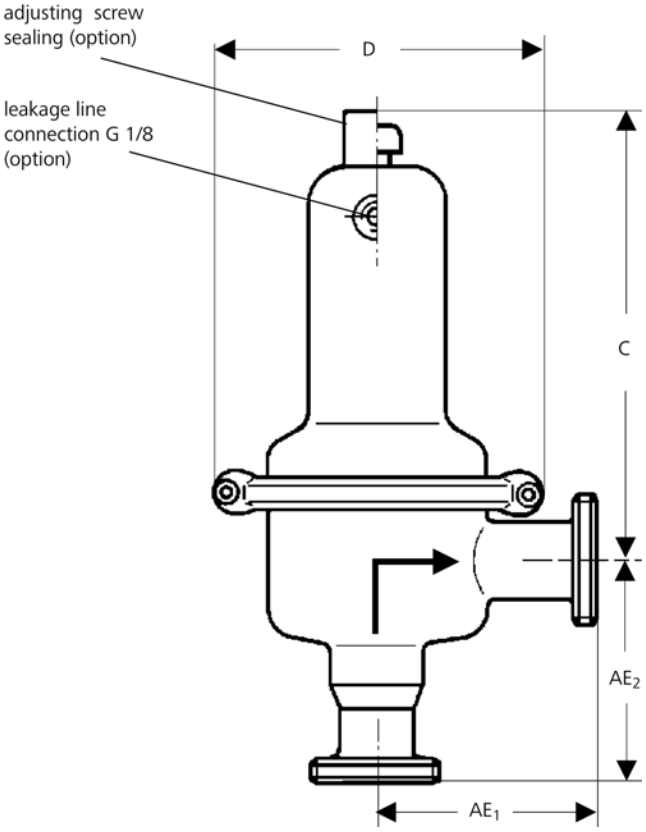
* dimensions can vary according to type of connection, please inquire

Weights [kg]

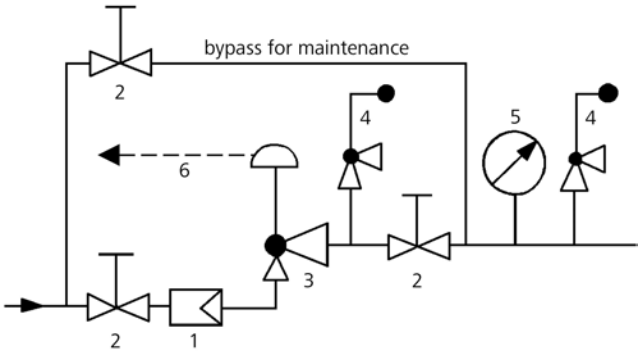
pressure range [bar]	nominal diameter DN					
	15	20	25	32	40	50
0.8 - 2.5	2	2	2	2.5	2.5	3
1 - 5	2	2	2	2.5	2.5	3
0.3 - 1.1	3	3	3	3.5	3.5	4

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Pressure Reducer
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 3, 4

Weight Loaded Pressure Reducing Valve

Technical Data

Connection DN	50 - 400
Nominal Pressure PN	16 - 40
Inlet Pressure	up to 40 bar
Outlet Pressure	0.5 - 10 bar
K_{vs}-Value	32 - 1200 m^3/h
Temperature	280 °C
Medium	liquids, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 3 and DM 4 pressure reducers are medium-controlled weighted-lever valves for medium to large volumes. These valves require no auxiliary energy. Thanks to their integral control characteristics they are very accurate. The time reponse is set by means of an oil-filled damper.
DM 3 is a single seat, DM 4 a twin seat valve; both are piston-controlled. The valves can be supplied with soft or hard seals.

When the pipeline is depressurised the valve cone is kept in open position by the weighted lever. As the outlet pressure rises a control piston is pressurised via a pilot line, lifting the lever and moving the valve cone towards the „closed" position. During normal operation the opening force of the weight and the closing force of the piston balance each other and the pressure reducer operates continually. The outlet pressure is kept constant irrespective of inlet pressure and flow volume. The control pressure is set by changing the weight on the lever.

The maximum outlet pressure must not exceed 1.5 times the set pressure, unless specified otherwise.

In the case of toxic or hazardous media a leakage line must be installed to the control unit capable of draining leaking medium safely and without pressure if the control element should become defective.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent (DM 3) respectively 0.5 percent (DM 4) of the constant volume flow is permitted for the valve in closed position.

The valves requires a sense line (to be installed on-site).

Options

» various seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]					
type	nominal diameter DN				
	50	65	80	100	125
3 (E)	32	50	75	100	140
4 (E)	40	65	100	150	180

Suffix E = enlarged outlet

K_{vs}-Values [m^3/h]						
type	nominal diameter DN					
	150	200	250	300	350	400
3 (E)	200	300	450	550	650	800
4 (E)	250	400	550	700	750	1200

Suffix E = enlarged outlet

Pressure Control Valves

Pressure Reducing Valves DM 3, 4

Weight Loaded Pressure Reducing Valve

Materials		
Temperature	80 °C	
Nominal Pressure	PN 16	PN 40
Operating Pressure	max. 16 bar	max. 40 bar
Body	spherodial cast iron or cast steel	cast steel
Tubular Section	steel welded	
Internals	chromium steel / CrNiMo-steel	
Valve Seal	NBR / FPM / EPDM / PTFE cromium steel / CrNiMo-steel	
O-Ring	NBR / FPM / EPDM / PTFE	

Materials		
Temperature	280 °C	
Nominal Pressure	PN 16	PN 40
Operating Pressure	max. 13 bar	max. 28 bar
Body	cast steel	
Tubular Section	steel welded	
Internals	chromium steel / CrNiMo-steel	
Valve Seal	chromium steel / CrNiMo-steel	
O-Ring	FXM / FFKM	

Dimensions [mm]						
Size	nominal diameter DN					
	50	65	80	100	125	150
A	580	630	670	750	850	980
B	120	200	200	200	260	260
C*	650	850	850	850	900	900
D*	750	1150	1150	1150	1500	1500

Dimensions [mm]					
size	nominal diameter DN				
	200	250	300	350	400
A	1200	1430	1650	1800	2100
B	260	350	350	350	420
C*	900	1100	1100	1100	1100
D*	1500	2000	2000	2000	2000

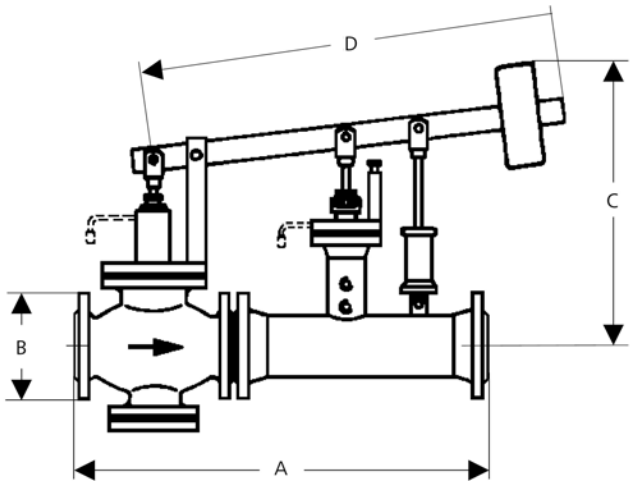
Dimensions [mm] (enlarged outlet)				
size	nominal diameter DN			
	50/100	65/125	80/150	100/200
A	650	770	850	1000
B	120	180	180	230
C*	650	850	850	950
D*	750	1150	1150	1300

Dimensions [mm] (enlarged outlet)			
size	nominal diameter DN		
	125/250	150/300	200/400
A	1200	1500	1650
B	230	260	280
C*	950	1130	1200
D*	1300	1700	1800

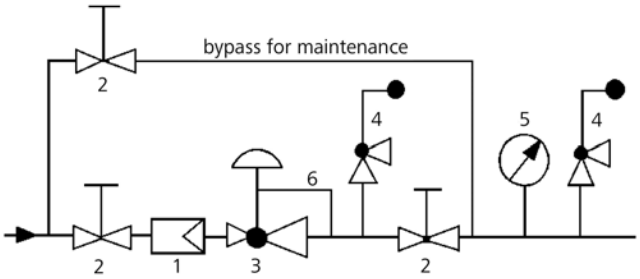
*Dimensions C and D are reference dimensions. The weighted lever (dim. D) may project beyond the valve outlet flange.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure 'Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2

sense line connection 10 - 20 x DN behind the valve.
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 401

Valve for High Pressures + High Temperature

Technical Data

Connection DN	25 - 250
Nominal Pressure PN	16 - 100
Inlet Pressure	up to 100 bar
Outlet Pressure	1.5 - 32 bar
K_{vs}-Value	6 - 360 m^3/h
Temperature	500 °C
Medium	steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 401 pressure reducing valve is a diaphragm or piston-controlled spring-loaded proportional control valve with pressure relief for large flow rates at low pressure drops. The valve cone is fitted with a metallic seal.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.5 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- balanced cone for controlling the outlet pressure indipendently from the initial pressure.
- open spring
- sense line connection

Options

- mid section for higher temperatures (400 - 500 °C)
- hydraulic damping
- enlarged outlet
- various diaphragm and seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-values [m^3/h]						
DN	25	32	40	50	65	80
m^3/h	6	11	16	25	42	65

K_{vs}-values [m^3/h]					
DN	100	125	150	200	250
m^3/h	80	120	170	230	360

Pressure Control Valves

Pressure Reducing Valves DM 401

Valve for High Pressures + High Temperature

Materials DM 401 PN 16	
Body	cast iron
Bottom Part	cast iron
Spring	spring steel C
Internals	on request
Diaphragm	CR

Materials DM 401 PN 25 - 40			
Temperature	300°C	350°C	400°C
Body	cast iron	cast iron	GS 17 CrMo 55
Bottom Part	cast iron	cast iron	cast iron
Mid Section	-	-	GS 17 CrMo 55
Spring	spring steel C	spring steel C	spring steel C
Internals	on request		
Diaphragm	CR	Cr	Cr
O-ring	NBR	NBR	NBR

Materials DM 401 PN 63 - 100			
Temperature	350°C	400°C	500°C
Body	cast iron	GS 17 CrMo 55	GS 17 CrMo 55
Bottom Part	cast iron	cast iron	cast iron
Mid Section	-	GS 17 CrMo 55	GS 17 CrMo 55 or 10 CrMo 9-10
Spring	spring steel C	spring steel C	spring steel C
Internals	on request		
Diaphragm	CR	Cr	Cr
O-ring	NBR or EPDM	NBR or EPDM	NBR or EPDM

Dimensions [mm]

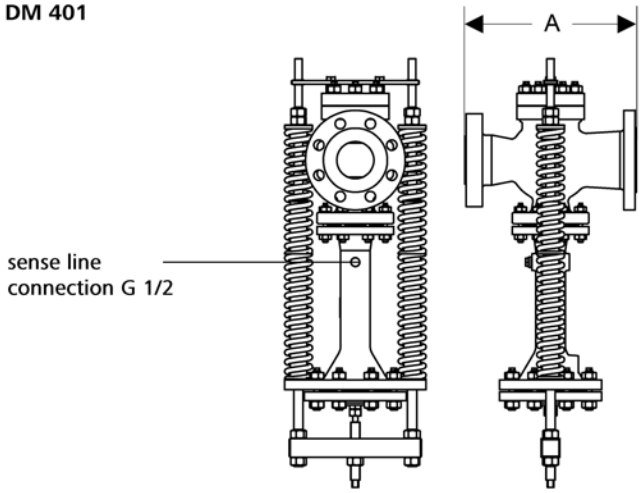
size	nominal pressure	nominal diameter DN										
		25	32	40	50	65	80	100	125	150	200	250
A	PN 16 - 40	-	180	200	230	290	310	350	400	480	600	730
	PN 63 - 100	230	-	260	300	330	380	430	500	-	-	-

As the DM 401 pressure reducing valve is designed specifically for your operating data and may vary considerably in terms of construction, we are unable at this stage to give any dimensions or weights. Please contact us if you have specific queries.

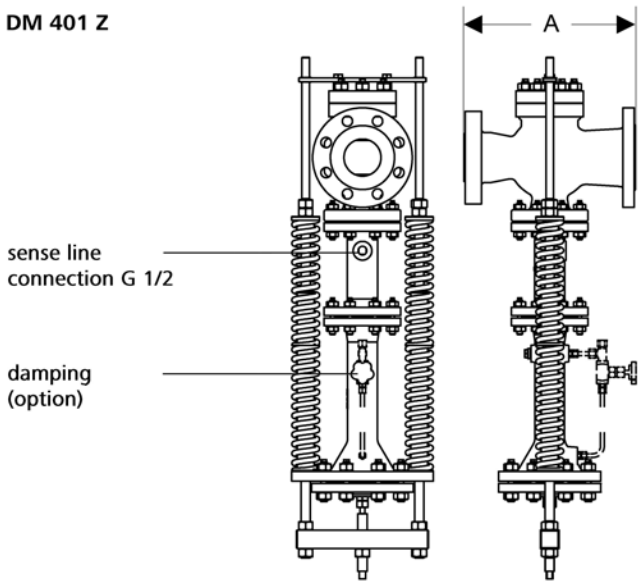
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

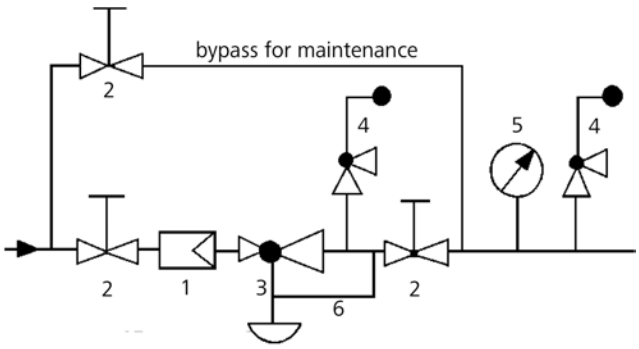
DM 401



DM 401 Z



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valve
5 Pressure Gauge
6 Sense Line G 1/2

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 462

Valve for Hygiene Applications | Ultrapure Media

Technical Data

Connection DN	25 - 80
Nominal Pressure PN	2.5 - 10
Inlet Pressure	up to 8 bar
Outlet Pressure	0.3 - 5 bar
K_{vs}-Value	4 - 70 m^3/h
Temperature	180 °C
Medium	liquids, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 462 pressure reducing valve is a twin seat diaphragm-controlled spring-loaded proportional control valve which is primarily used for hygienic applications in the food processing and pharmaceutical industries. A PTFE protective foil renders the diaphragm physiologically safe and steamproof up to 180 °C. The valve does not require an external pilot line.

This valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. It contains virtually no dead pockets and is suitable for use in CIP and SIP systems. The angled design allows complete draining.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.5 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- clamping flanges DIN 32676
- non rising adjusting screw
- quick-release body clamp ring

Options

- polished version for food, pharmaceutical and superclean applications, surface roughness: Ra ≤ 0.25/ ≤ 0.4/ ≤ 0.8 µm
- diaphragm protection by PTFE foil
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]				
nominal diameter DN				
25	40	50	65	80
4	22	22	60	70

Setting Ranges [bar] and Nominal Pressure PN		
nominal diameter DN		
40 - 80	25 - 80	25 - 80
0.3 - 1.1	0.8 - 2.5	2 - 5
PN 10/2.5	PN 10/6	PN 10/10

Pressure Control Valves

Pressure Reducing Valves DM 462

Valve for Hygiene Applications | Ultrapure Media

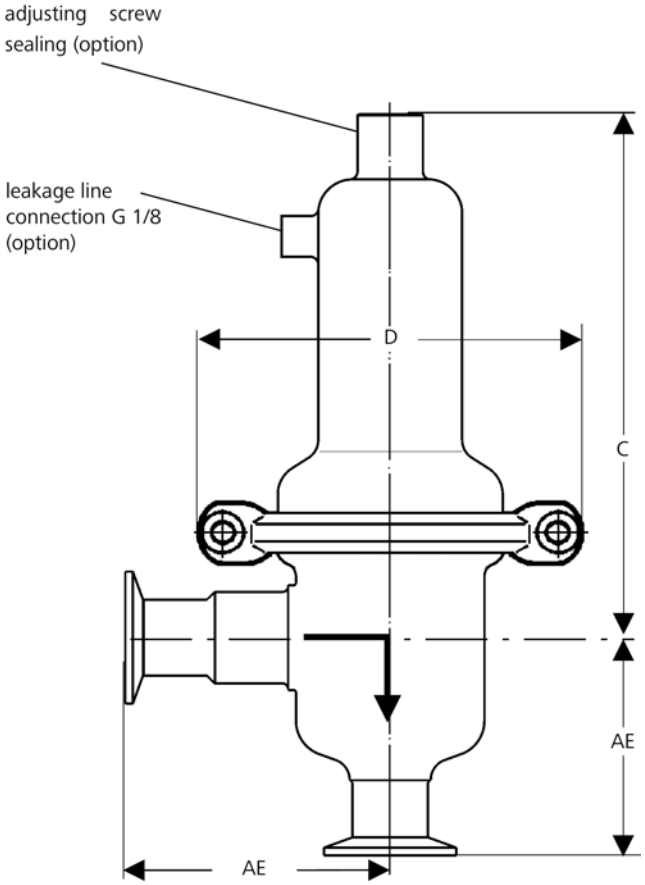
Materials		
Temperature	130 °C	180 °C
Body, Spring Cap, Internals	SST 316L	SST 316L
Valve Seal	EPDM	FEPM
Spring	CrNi-steel	CrNi-steel
Diaphragm	EPDM	FPM
Protection Foil for Diaphragm	Option	PTFE

Dimensions [mm]					
size	nominal diameter DN (clamping flanges)				
	25	40	50	65	80
AE	100	115	125	175	175
C	205	230	230	515	515
D	138	200	200	240	240

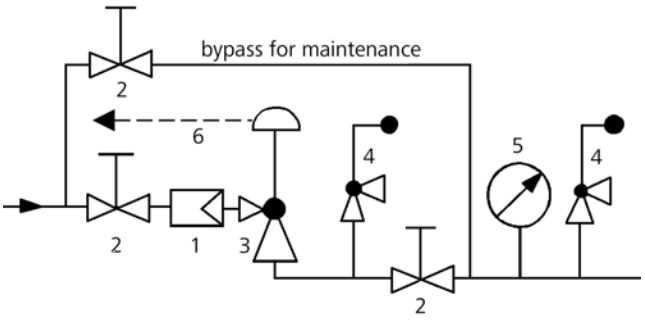
Weights [kg]				
nominal diameter DN (clamping flanges)				
25	40	50	65	80
2.5	6.5	6.5	26	26

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Pressure Reducer
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 462V

Valve for Hygiene Applications / Ultrapure Media

Technical Data

Connection DN	25
Nominal Pressure PN	2.5 - 16
Inlet Pressure	8 bar
Outlet Pressure	0.8 - 5 bar
K_{vs}-Value	4 m^3/h
Temperature	180 °C
Medium	liquids, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The pressure reducing valve DM 462V is a double-seat diaphragm-controlled and spring-loaded proportional control valve which is predominantly used for hygiene applications in the foodstuffs and pharmaceutical industry. Owing to the PTFE protecting foil the diaphragm is physiologically harmless and can be exposed to steam at a temperature of up to 180°C.

The valve is made of stainless steel featuring excellent resistance to corrosion. It has cavity-free internals and is suitable for CIP and SIP. The angled design allows for complete draining. The precise cone spindle guide is arranged outside the throughflow space, thus there is no abrasion in the space through which the medium flows. The design was carried out in accordance with ASME BPE. Clamp connections in accordance with DIN 32676, DIN 11866 line A are standard.

The spring cap with spring module and adjusting screw, body bottom (outlet), diaphragm and internals are connected to the body by means of two profile clamps.
Thus replacement of the diaphragm or of the entire spring module for another regulating range can be easily done without using special tools. This also applies for maintenance work. Setting the regulating pressure does not change the valve's overall height (non rising adjusting screw).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

Standard

- all stainless steel construction (1.4404/1.4435, 316L)
- non rising adjusting screw
- quick-release body clamp ring
- diaphragm protected by PTFE foil

Options

- straight-through design or three connecting pieces
- polished version for food, pharmaceutical and superclean applications (Ra ≤ 0.25/ ≤ 0.4/ ≤ 0.8 µm)
- pneumatic activation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]
nominal diameter DN
25
4

Pressure Ranges [bar] and Nominal Pressure PN	
0.8 - 2.5	2 - 5
PN 16/6	PN 16/10

Pressure Control Valves

Pressure Reducing Valves DM 462V

Valve for Hygiene Applications / Ultrapure Media

Materials		
Temperature	130 °C	180 °C
Body, Spring Cap, Internals	CrNiMo-steel	CrNiMo-steel
Valve Seal	EPDM	FEPM
Spring	CrNi-steel	CrNi-steel
Diaphragm	EPDM	FPM
Protection Foil for Diaphragm	PTFE	PTFE

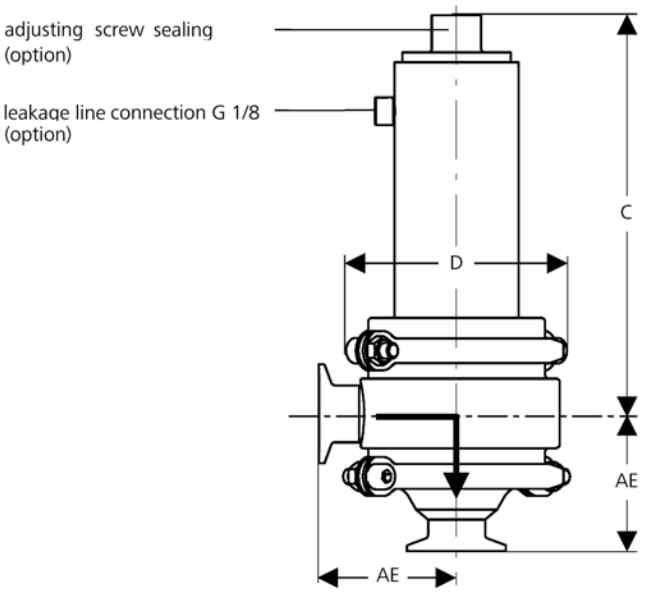
Dimensions [mm] angle design	
size	nominal diameter DN (clamps)
	25
AE	85
C	205

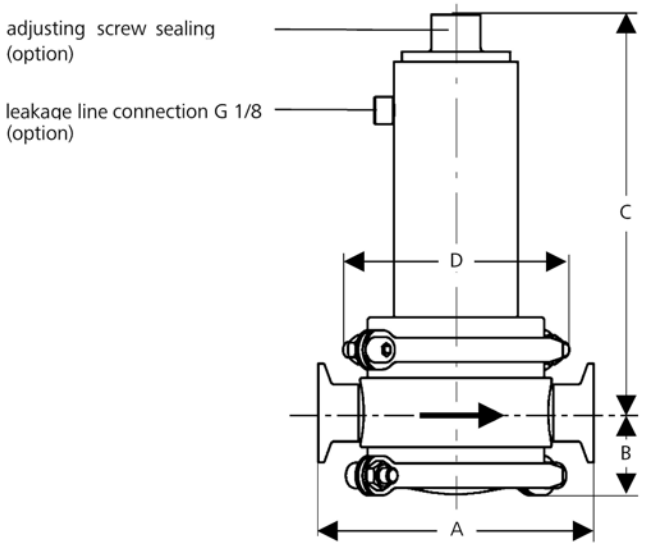
Dimensions [mm] straight-through design	
size	nominal diameter DN (clamps)
	25
A	140
B	45
C	205

Weights [kg]
nominal diameter DN (clamps)
25
5

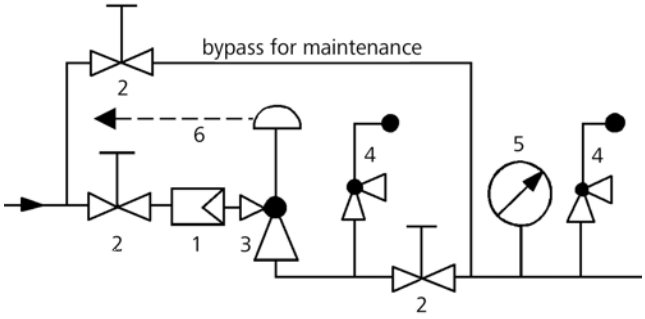
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Recommended Installation



1 Strainer
2 Shutoff valves
3 Overflow Valve
4 Safety Valve
use MANKENBERG-Products
5 Pressure Gauge
6 Leakage Line G 1/8 (option)

Pressure Control Valves

Pressure Reducing Valves DM 502

Standard Valve

Technical Data

Connection G	1/2 - 2
Nominal Pressure PN	100
Inlet Pressure	up to 100 bar
Outlet Pressure	0.02 - 16 bar
K_{vs}-Value	0.6 - 4.2 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 502 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve specially designed for CO_2. This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

A sense line is required for outlet pressures ≤ 1.1 bar (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- body and spring cap made of stainless steel
- non rising adjusting screw
- quick-release body clamp ring
- sense line connection (only for outlet pressures ≤ 1,1 bar)

Options

- pressure gauge connection
- pneumatic actuation
- drain hole provided at bottom of spring cover for draining condensate
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]						
nominal diameter G	1/2	3/4	1	1 1/4	1 1/2	2
m^3/h	0.6	0.9	1.5	2.8	3.6	4.2

Setting Ranges [bar]						
0.02-0.12	0.1-0.5	0.3-1.1	1 - 2.5	2 - 5	4 - 8	6 - 12	10 - 16

Permissible Reduction Ratio (max. p_1/p_2)						
nom. diameterG	1/2	3/4	1	1 1/4	1 1/2	2
setting range 0.02 - 0.12 bar						
ratio p_1/p_2	810	750	530	280	230	185
setting range 0.1 - 0.5 bar						
ratio p_1/p_2	220	200	140	75	60	50
setting range 0.3 - 1.1 bar						
ratio p_1/p_2	100	90	65	35	25	20
setting range 1 - 2.5 bar						
ratio p_1/p_2	55	50	35	20	15	10
setting range 2 - 5, 4 - 8 and 6 - 12 bar						
ratio p_1/p_2	25	25	15	10	8	6
setting range 10 - 16 bar						
ratio p_1/p_2	20	15	13	7	5	4

Pressure Control Valves

Pressure Reducing Valves DM 502

Standard Valve

Materials		
Temperature	80 °C	130 °C
Body, Spring Cap	CrNiMo-steel	CrNiMo-steel
Internals	brass, Cr-steel	brass, Cr-steel
Spring	CrNi-steel	CrNi-steel
Valve Seal	EU	FPM optional EPDM orPTFE
Diaphragm	CR	FPM optional EPDM
Protection Foil for Diaphragm	PTFE (option)	PTFE (option)

Dimensions [mm]

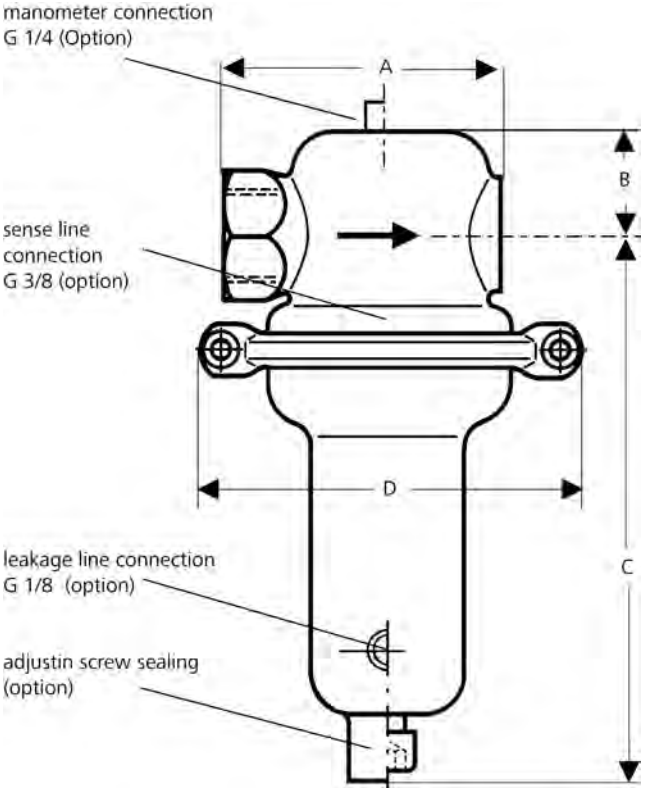
setting range bar	size	nominal diameter G					
		1/2	3/4	1	1 1/4	1 1/2	2
all ranges	A	85	95	105	120	130	150
	B	37	48	45	43	50	56
0.02 - 0.12	C	260	265	270	270	270	285
	D	360	360	360	360	360	360
0.1 - 0.5	C	260	265	270	270	270	285
	D	264	264	264	264	264	264
0.3 - 1.1	C	260	265	270	270	270	285
	D	200	200	200	200	200	200
1 - 16	C	195	200	200	205	205	220
	D	138	138	138	138	138	138

Weights [kg]

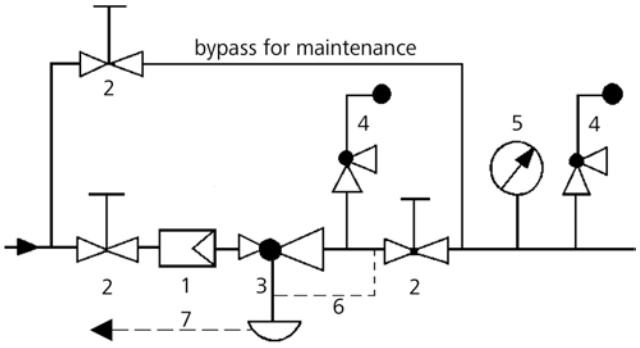
setting range bar	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
0.02 - 0.12	10	12	12	13	13.5	14
0.1 - 0.5	5.5	7	7	8	8.5	9
0.3 - 1.1	4.5	6	6	7	7.5	8
1 - 16	1.5	2	2	2.5	3	3.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure 'Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 3/8 (option)
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 505

Valve for Small Flow Rates

Technical Data

Connection DN	15 - 25
Connection G	1/2
Nominal Pressure PN	250
Inlet Pressure	up to 250 bar
Outlet Pressure	0.005 - 20 bar
K_{vs}-Value	0.2 - 0.90 m^3/h
Temperature	130 °C
Medium	liquids, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 505 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for small volumes. This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The tubular inlet spigot of the valve body accommodates the seat aperture. The soft-sealing valve cone is guided in the seat assembly and connected with the control diaphragm by means of a stirrup which surrounds the seat assembly.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

Outlet pressures ≤ 1.1 bar DM 505 requires a sense line (to be installed on-site).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- non rising adjusting screw
- quick-release body clamp ring
- sense line connection (for DM 505 with outlet pressures ≤ 1,1 bar)

Options

- pressure gauge connection
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]			
for all body sizes, please select	0.2	0.5	0.9

Setting Ranges [bar] DM 505							
0.005-0.025	0.02-0.12	0.1-0.5	0.2-1.1	0.8-2.5	1-5	4-12	10-20

Permissible Reduction Ratio (max. p_1/p_2)			
setting range bar	K_{vs}-value		
	0.2	0.5	0.9
0.005 - 0.12	1485	1000	750
0.1 - 0.5	405	280	210
0.2 - 1.1	185	125	100
0.8 - 2.5	105	70	50
1 - 20	39	27	20

Pressure Control Valves

Pressure Reducing Valves DM 505

Valve for Small Flow Rates

Materials	
Temperature	130 °C
Body	CrNiMo-steel
Spring Cap	CrNiMo-steel
Internals	CrNiMo-steel
Adjusting Screw	CrNiMo-steel
Spring	CrNi-steel
Valve Seal	FPM optional EPDM or PTFE
Diaphragm	FPM or EPDM
Protection Foil	PTFE (Option)

Dimensions [mm]

setting ranges bar	size	G 1/2	flanges acc. to DIN EN 1092-1		
			DN 15	DN 20	DN 25
0,005 - 0,025 0,02 - 0,12	A/A_1	100	130	150	160
	B	39	39	39	39
	C	257	257	257	257
	D	360	360	360	360
0,1 - 0,5	A/A_1	100	130	150	160
	B	39	39	39	39
	C	257	257	257	257
	D	264	264	264	264
0,2 - 1,1	A/A_1	100	130	150	160
	B	39	39	39	39
	C	257	257	257	257
	D	200	200	200	200
0,8 - 2,5	A/A_1	100	180	180	180
	B	39	39	39	39
	C	196	196	196	196
	D	138	138	138	138
1 - 5 4 - 12 10 - 20	A/A_1	100	130	150	160
	B	39	39	39	39
	C	190	190	190	190
	D	114	114	114	114

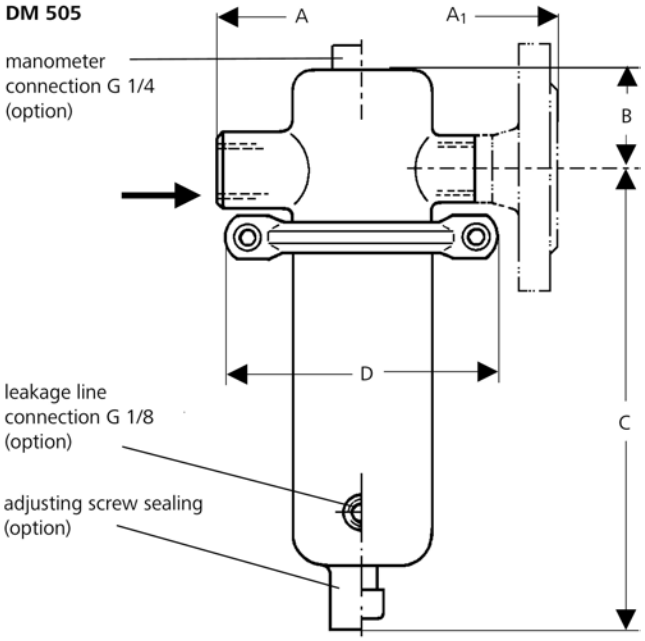
Weights [kg]

setting ranges bar	G 1/2	flanges acc. to DIN EN 1092-1		
		DN 15	DN 20	DN 25
0.005 - 0.025 0.02 - 0.12	6	7.5	7.5	8
0.1 - 0.5	5.5	7	7	7.5
0.2 - 1.1	4.5	6	6	6.5
0.8 - 2.5	2	3.5	3.5	4
1 - 20	1.5	3	3	3.5

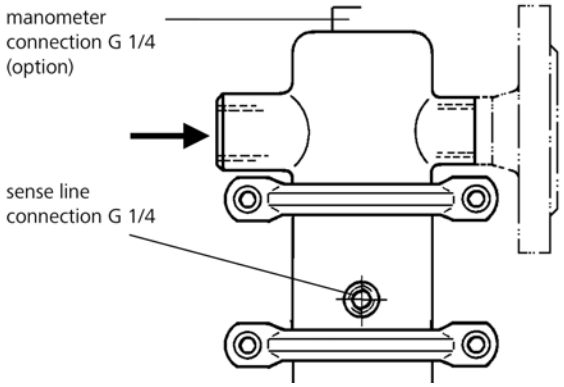
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

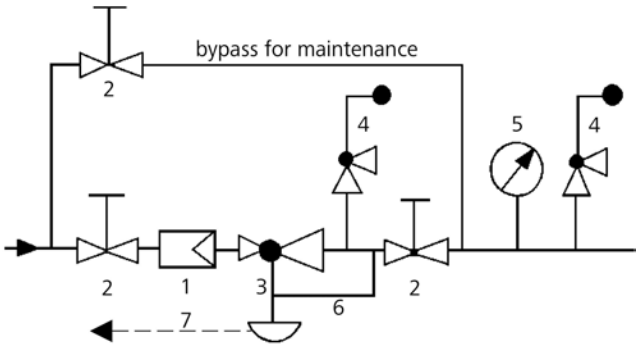
DM 505



DM 505Z (dimensions see DM 505)



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure 'Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/4 (DM 505Z)
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 505Z

Valve for Steam Applications

Technical Data

Connection DN	15 - 25
Connection G	1/2
Nominal Pressure PN	250
Inlet Pressure	up to 250 bar
Outlet Pressure	0.005 - 12 bar
K_{vs}-Value	0.2 - 0.9 m³/h
Temperature	200 °C
Medium	steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 505Z pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for small volumes. This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The tubular inlet spigot of the valve body accommodates the seat aperture. The valve cone is guided in the seat assembly and connected with the control diaphragm by means of a stirrup which surrounds the seat assembly.
Considering the intermediate piece incl. water trap between body and diaphragm and the metallic cone seal the valve is suitable for temperatures up to 200°C.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- non rising adjusting screw
- quick-release body clamp ring
- sense line connection

Options

- pressure gauge connection
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

K_{vs} values [m³/h]			
for all body sizes, please select	0.2	0.5	0.9

Setting Ranges[bar]						
0.005-0.025	0.02-0.12	0.1-0.5	0.2-1.,1	0.8-2.5	1-5	4-12

Permissible Reduction Ratio (max. p_1/p_2)			
setting range bar	K_{vs} value		
	0.2	0.5	0.9
0.005 - 0.12	1485	1000	750
0.1 - 0.5	405	280	210
0.2 - 1.1	185	125	100
0.8 - 2.5	105	70	50
1 - 5 / 4 - 12	39	27	20

Pressure Control Valves

Pressure Reducing Valves DM 505Z

Valve for Steam Applications

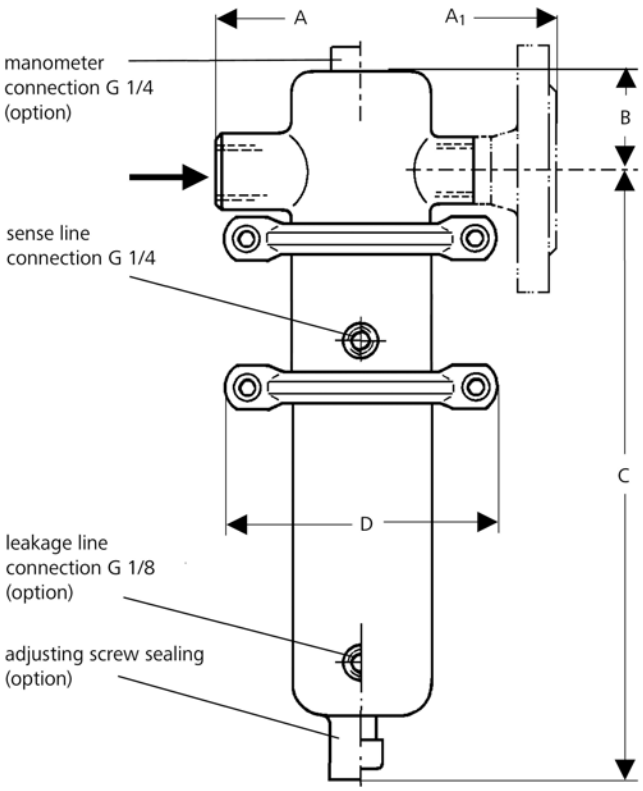
Materials	
Temperature	200 °C
Body	CrNiMo-steel
Spring Cap	CrNiMo-steel
Internals	CrNiMo-steel
Adjusting Screw	CrNiMo-steel
Spring	CrNi-steel
Valve Sealing	CrNiMo-steel
Diaphragm	EPDM
Protection Foil	PTFE (option)

Dimensions[mm]					
setting range bar	size	G 1/2	flange acc. to DIN EN 1092-1		
			DN 15	DN 20	DN 25
all ranges	A/A_1	100	130	150	160
	B	39	39	39	39
0.005 - 0.025	C	387	387	387	297
0.02 - 0.12	D	360	360	360	360
0.1 - 0.5	C	387	387	387	297
	D	264	264	264	264
0.2 - 1.1	C	387	387	387	387
	D	200	200	200	200
0.8 - 2.5	C	325	325	325	325
	D	138	138	138	138
1 - 5	C	325	325	325	325
4 - 12	D	114	114	114	114

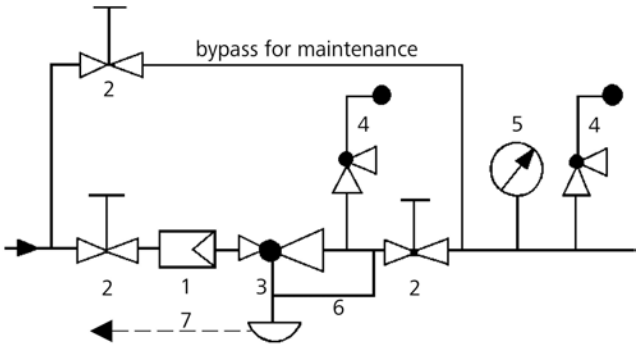
Weights [kg]				
setting rangesbar	G 1/2	flange acc. to DIN EN 1092-1		
		DN 15	DN 20	DN 25
0.005 - 0.12	6.5	8	8	8.5
0.1 - 0.5	6	7.5	7.5	8
0.2 - 1.1	5	6.5	6.5	7
0.8 - 2.5	2.5	4	4	4.5
1 - 12	2	3.5	3.5	4

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure 'Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/4 (DM 505Z)
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 510 - 518

High Pressure Valve for Medium Flow Rate

Technical Data

Connection DN	15 - 50
Connection G	3/8 - 2
Nominal Pressure PN	16 - 315
Inlet Pressure	up to 315 bar
Outlet Pressure	2 - 160 bar
K_{VS}-Value	0.2 - 5.5 m³/h
Temperature	400 °C
Medium	liquid, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 510, DM 511, DM 514, DM 515, DM 516 and DM 518 pressure reducing valves are diaphragm, piston or bellows-controlled spring-loaded proportional control valves for high inlet and outlet pressures. They can be supplied with three types of connections: sockets, flanges and welding spigots. Each size of valve may be fitted with three different seats. The valve cone may be fitted with a soft or metallic seal.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{VS} value is permitted for the valve in closed position.

Options

- set pressure from 0,005 bar up to 2 bar (see sheet DM512/2.1....)
- pressure gauge connection
- hard-faced valve cone and seat
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
- special connections: ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Nominal Pressure, K_{VS}-Values, Setting Ranges and Permissible Reduction Ratio see sheet no. DM 510/2.1.....3

Pressure Control Valves

Pressure Reducing Valves DM 510 - 518

High Pressure Valve for Medium Flow Rate

Materials			
Temperature	80 °C	130 °C	400 °C
Body	G 3/8 - 1, DN 15 - 25 = C-steel G 1 1/4 - 2, DN 32 - 50 = steel welded optional CrNiMo-steel for all diameters		
Spring Cap	steel welded optional CrNiMo-steel		
Internals	CrNiMo-steel		
Spring	CrNi-steel		
Metallic Seal	CrNiMo-steel		
Soft Seal	EU	FPM optional EPDM or PTFE	-
Diaphragm	EPDM	FPM optional EPDM	-
Protection Foil	PTFE (option)		
O-ring for Piston	EPDM	FPM optional EPDM or PTFE	-
Bellow	-	-	CrNiMo-steel

Dimensions [mm] for DM 510, DM 511 and DM 516					
type	size	nominal diameter			
		G 3/8 - 1/2	G 3/4 - 1	G 1 1/4-1 1/2	G 2
		DN 15	DN 20 - 25	DN 32 - 40	DN 50
510	A	140	170	250	250
511	A_1	220	220	280*	300*
516	A/A_1	220	220	acc. to DIN 3202 - S14	
alle	B	80	80	110	110
alle	C	< 520	< 520	< 800	< 800

* with nominal pressure ≥ PN 63 on request

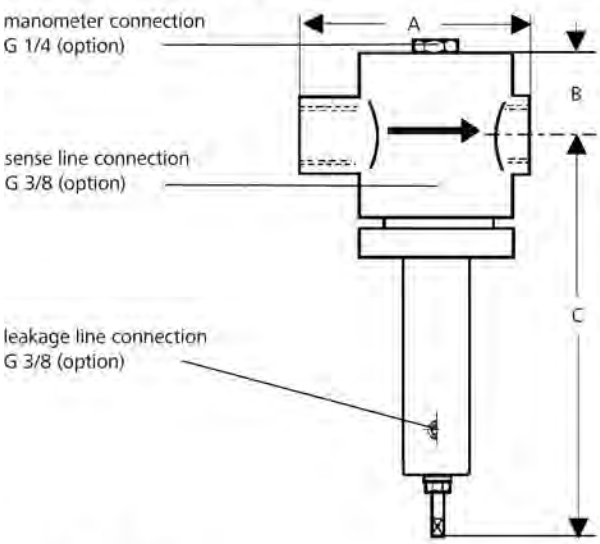
Dimensions [mm] for DM 514, DM 515 and DM 518	
size	all nominal diameter
A / A_1	220
B	90
C	< 530

Weights [kg] for DM 510, others on request						
nominal diameter						
3/8	1/2	3/4	1	1 1/4	1 1/2	2
13	13	14	15	21	21	21

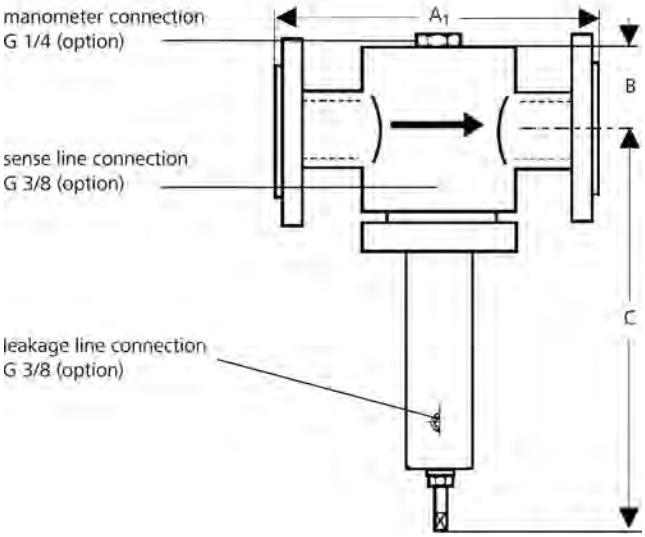
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

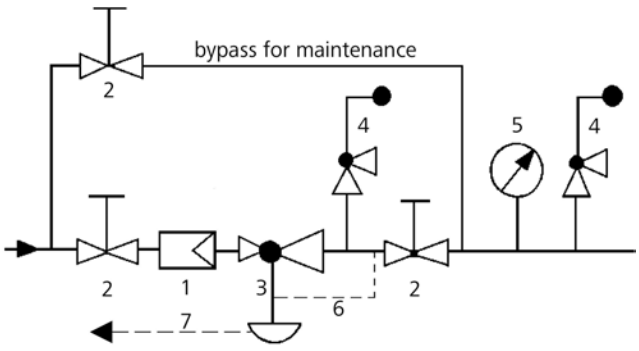
DM 510, DM 514, DM 516, DM 518



DM 511, DM 515



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 3/8 (option)
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 510 - 518

High Pressure Valve for Medium Flow Rate

Kvs-Values [m^3/h]								
nominal diameter								
G		3/8	1/2	3/4	1	1 1/4	1 1/2	2
DN		-	15	20	25	32	40	50
seat	I	0.2	0.2	0.25	0.25	0.4	0.4	1
	II	0.9	0.9	0.9	0.9	2.5	2.5	3.5
	III	1.7	1.8	2	2.2	3.9	3.9	5.5

Setting Ranges [bar], Nominal Pressure DM 510, 511, 516				
2 - 4	4 - 7	7 - 10	5 - 16	10 - 20
PN 315/6	PN 315/16	PN 315/16	PN 315/25	PN 315/25
10 - 25	20 - 35	35 - 50	45 - 63	60 - 100
PN 315/40	PN 315/40	PN 315/63	PN 315/100	PN 315/100

Setting Ranges [bar], Nominal Pressure DM 514, 515, 518	
40 - 100	80 - 160
PN 315/100	PN 315/160

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Permissible Reduction Ratio (max. p_1/p_2) DM 510, 511, 516				
setting range bar	seat	nominal diameter		
		G 3/8 - 1	G 1 1/4 - 1 1/2	G 2
		DN 15 - 25	DN 32 - 40	DN 50
2 - 4	I	100	80	60
	II	30	29	18
	III	15	15	12
4 - 7	I	80	52	39
	II	30	19	12
	III	15	10	8
7 - 10	I	80	38	28
	II	30	14	8
	III	15	7	6
5 - 16	I	32	45	33
	II	21	16	10
	III	9	8	7
10 - 20	I	32	38	28
	II	21	14	8
	III	9	7	6
10 - 25	I	20	25	18
	II	17	9	6
	III	7	4.5	4
20 - 35	I	16	20	15
	II	13	7	4.5
	III	4	3.5	3
35 - 50	I	9	15	11
	II	9	5.5	3
	III	4	3	2.5
45 - 63	I	7	11	8
	II	7	4	2.5
	III	3	2	1.5
60 - 100	I	6	8	5.5
	II	6	2.5	1.5
	III	2.5	1.5	1.2

Permissible Reduction Ratio (p_1/p_2) DM 514, 515, 518			
setting range bar	seat	G 3/8 - 2	DN 15 - 50
all ranges	I	4	
	II		
	III		

Pressure Control Valves

Pressure Reducing Valves DM 512, 513, 517

High Press. and Control Ranges lower than 2 bar

Technical Data

Connection DN	15 - 50
Connection G	3/8 - 2
Nominal Pressure PN	100
Inlet Pressure	up to 100 bar
Outlet Pressure	0.005 - 2 bar
K_{vs}-Value	0.2 - 5.5 m³/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 512, DM 513 and DM 517 pressure reducing valves are diaphragm-controlled spring-loaded proportional control valves for high inlet and low outlet pressures. They can be supplied with three types of connections: sockets, flanges and welding spigots. Each size of valve may be fitted with three different seats. The valve cone may be fitted with a soft or metallic seal.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Options

- pressure gauge connection
- hard-faced valve cone and seat
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
- special connections: ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Nominal Pressure, K_{vs}-Values, Setting Ranges and Permissible Reduction Ratio see sheet no. DM 512/2.1.121.3

Pressure Control Valves

Pressure Reducing Valves DM 512, 513, 517

High Press. and Control Ranges lower than 2 bar

Materials		
Temperature	80 °C	130 °C
Body	G 3/8 - 1, DN 15 - 25 = C-steel G 1 1/4 - 2, DN 32 - 50 = steel welded optional CrNiMo-steel for all body sizes	
Spring Cap	steel welded optional CrNiMo-steel	
Internals	CrNiMo-steel	
Spring	CrNi-steel	CrNi-steel
Valve Seal	EU	FPM optional EPDM, PTFE
Metallic Seal	CrNiMo-steel	CrNiMo-steel
Diaphragm	EPDM	FPM optional EPDM
Protection Foil	PTFE (option)	PTFE (option)

Dimensions DM 512 [mm]

pressure range bar	size	nominal diameter G		
		G 3/8 - 1/2	G 3/4 - 1	1 1/4 - 2
all ranges	A	140	170	250
	B	80	80	110
	C	470	470	max. 720
0.005 - 0.07	D	500	500	850
0.02 - 0.1	D	360	360	500
0.05 - 0.4	D	270	270	360
0.1 - 0.8	D	220	220	270
0.3 - 2	D	175	175	220

Dimensions DM 513 [mm]

pressure range bar	size	nominal diameter DN		
		DN 15 - 25	DN 32-40	DN 50
all ranges	A_1	220	280*	300*
	B	80	110	110
	C	470	max. 720	max. 720
0.005 - 0.07	D	500	850	850
0.02 - 0.1	D	360	500	500
0.05 - 0.4	D	270	360	360
0.1 - 0.8	D	220	270	270
0.3 - 2	D	175	220	220

Dimensions DM 517 [mm]

pressure range bar	size	nominal diameter G		
		G 3/8 - 1	G 1 1/4 - 1 1/2	2
all ranges	A	220	270	300
	B	80	110	110
	C	470	max. 720	max. 720
0.005 - 0.07	D	500	850	850
0.02 - 0.1	D	360	500	500
0.05 - 0.4	D	270	360	360
0.1 - 0.8	D	220	270	270
0.3 - 2	D	175	220	220

Weights DM 512, 517 [kg]

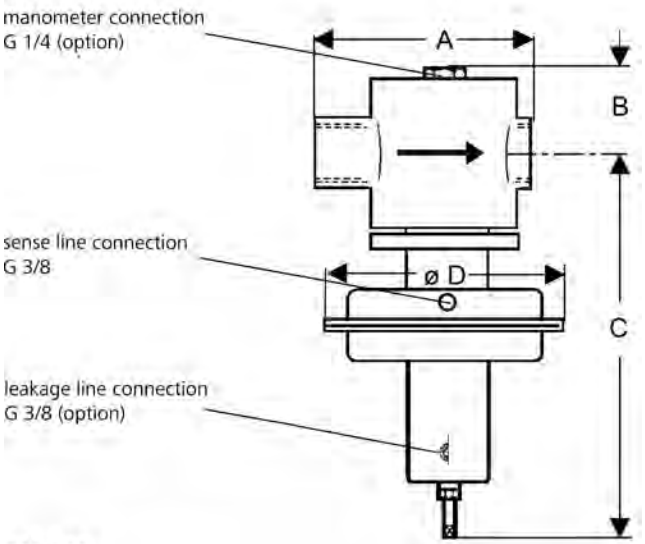
pressure range bar	nominal diameter G						
	G 3/8	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
0.005 - 0.07	36	36	37	38	75	75	75
0.02 - 0.1	40	40	41	42	47	47	47
0.05 - 0.4	37	37	38	39	39	39	39
0.1 - 0.8	25	25	26	27	37	37	37
0.3 - 2	19	19	20	21	35	35	35

weights for DM 513 on request

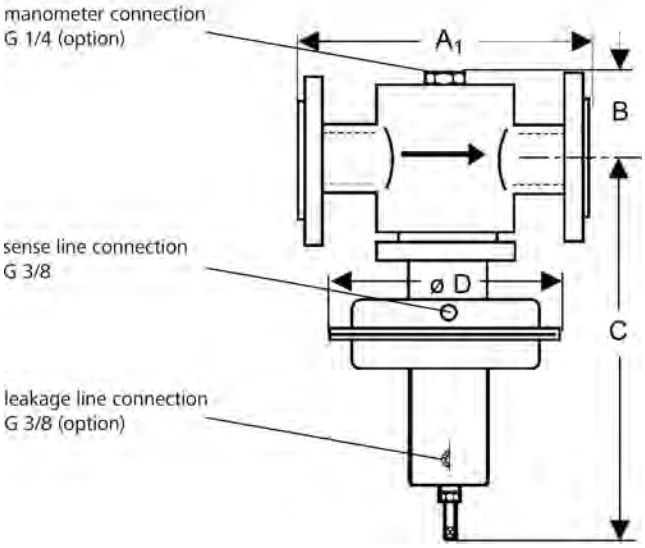
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

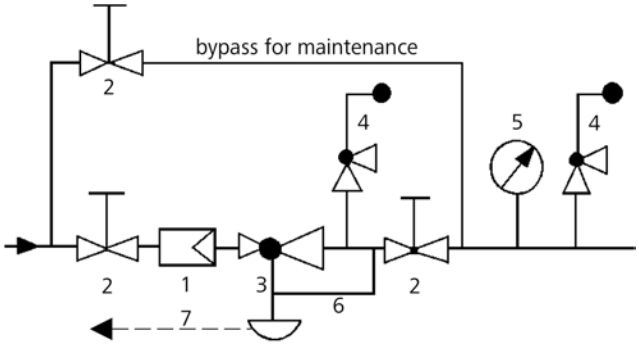
DM 512, DM 517



DM 513



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 3/8
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 512, 513, 517

High Press. and Control Ranges lower than 2 bar

K_{vs}-Values [m^3/h]								
nominal diameter								
G		3/8	1/2	3/4	1	1 1/4	1 1/2	2
DN		-	15	20	25	32	40	50
seat	I	0.2	0.2	0.25	0.25	0.4	0.4	1
	II	0.9	0.9	0.9	0.9	2.5	2.5	3.5
	III	1.7	1.8	2	2.2	3.9	3.9	5.5

Setting Ranges [bar], Nominal Pressure DM 512, 513, 517			
0.005 - 0.07	0.02 - 0.1	0.05 - 0.4	0.1 - 0.4
PN 100/1	PN 100/1	PN 100/1	PN 100/1
0.4 - 0.8	0.3 - 1	1 - 2	
PN 100/1.6	PN 100/1.6	PN 100/6	

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Max. Permissible Reduction Ratio (p_1/p_2) DM 512, 513, 517				
setting range bar	seat	nominal diameter		
		G 3/8 - 1	G 1 1/4 - 1 1/2	G 2
		DN 15 - 25	DN 32 - 40	DN 50
0.005 - 0.07	I	4000	6570	4865
	II	1500	2390	1490
	III	600	1200	1010
0.02 - 0.1	I	200	1950	1445
	II	800	710	440
	III	300	355	300
0.05 - 0.4	I	1000	1020	755
	II	400	370	230
	III	150	185	155
0.1 - 0.4	I	700	510	375
	II	200	185	115
	III	90	90	75
0.4 - 0.8	I	700	510	375
	II	200	185	115
	III	90	90	75
0.3 - 1	I	300	280	205
	II	100	100	60
	III	40	50	40
1 - 2	I	300	280	205
	II	100	100	60
	III	40	50	40

Pressure Control Valves

Pressure Reducing Valves DM 603

Standard Cast Valve

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Inlet Pressure	up to 40 bar
Outlet Pressure	0.02 - 10 bar
K_{vs}-Value	4 - 160 m^3/h
Temperature	350 °C
Medium	steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 603 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for high temperatures and large volumes. The valve cone is fitted with a metallic seal (up to 350 °C).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- balanced cone for controlling the outlet pressure indipendently from the initial pressure
- open spring
- pilot line connection

Options

- spring cap
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

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K_{vs}-Values [m^3/h]

DN	15	20	25	40	50	65	80	100	125	150
m^3/h	4	5	6	20	32	50	80	100	140	160

Setting Ranges [bar]

DN 15-50	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4.5 - 10
DN 65-100	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4 - 8
DN 125+150	0.05 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 3.5	2 - 5
PN	40/1	40/1	40/2.5	40/6	40/10	40/16

Pressure Control Valves

Pressure Reducing Valves DM 603

Standard Cast Valve

Materials	
Temperature	350 °C
PN 16 - 40	cast steel optional CrNiMo-steel
Diaphragm Housing	steel welded optional CrNiMo-steel
Spring Cap	steel welded optional CrNiMo-steel
Spring	spring steel C optional CrNi-steel
Diaphragm	EPDM
O-Ring (balance)	EPDM

Dimensions [mm]

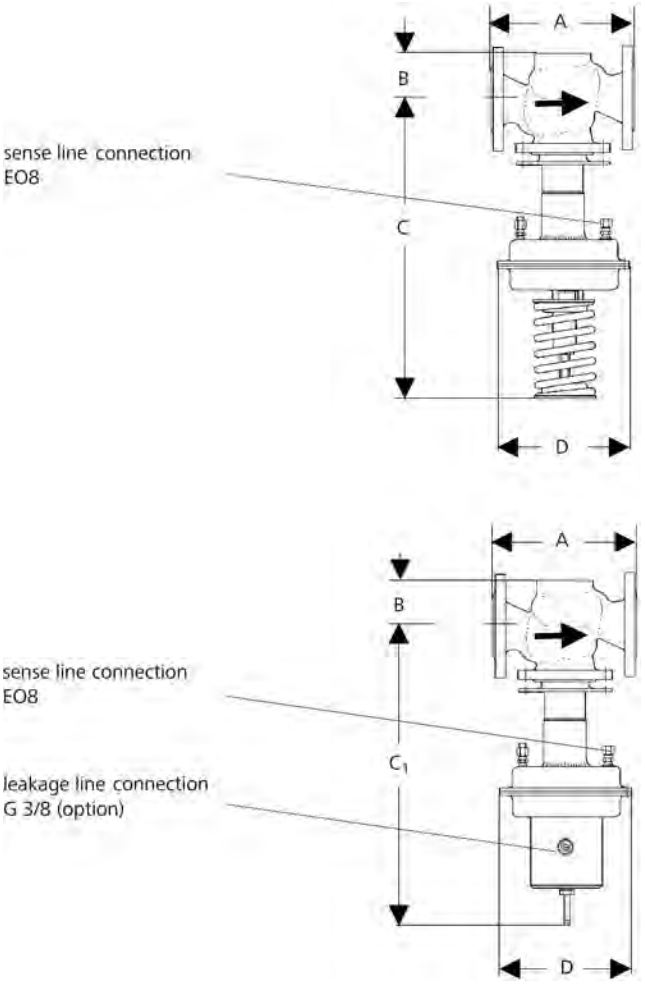
size	pressure range bar	nominal diameter DN									
		15	20	25	40	50	65	80	100	125	150
A	0.02-5/8/10	130	150	160	200	230	290	310	350	400	480
B		55	55	55	75	75	105	105	105	220	220
C	4.5 - 8/10	690	690	690	830	930	880	880	880	1040	1040
C_1	2 - 3.5/5	820	820	820	990	990	1040	1040	1040	1200	1200
D	0.8 - 2.5	175	175	175	220	220	220	220	220	220	220
C	0.2 - 1.2	710	710	710	830	830	880	880	880	940	940
C_1		840	840	840	990	990	1040	1040	1040	1100	1100
D		220	220	220	270	270	270	270	270	270	270
C	0.1 - 0.6	710	710	710	830	830	880	880	880	940	940
C_1		840	840	840	990	990	1040	1040	1040	1100	1100
D		270	270	270	360	360	360	360	360	360	360
C	0.02 / 0.05 - 0.25	710	710	710	710	710	760	760	760	940	940
C_1		840	840	840	870	870	920	920	920	1100	1100
D		360	360	360	360	360	360	360	360	500	500

Weights [kg]

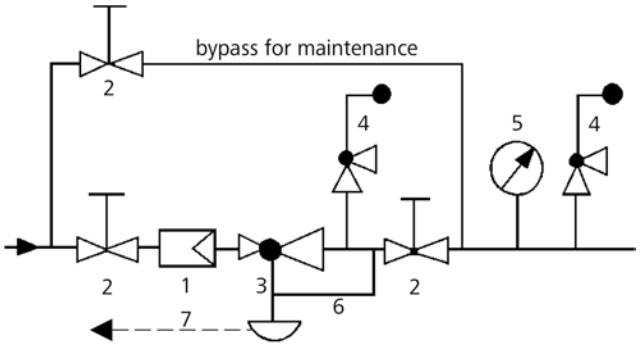
nom. pressure	pressure range bar	nominal diameter DN									
		15	20	25	40	50	65	80	100	125	150
PN 16	0.8 - 5/8/10	18	18	19	33	36	61	64	68	110	130
	0.2 - 1.2	20	20	21	35	38	63	66	70	112	132
	0.1 - 0.6	24	24	25	39	42	67	70	74	116	136
	0.02/0.05-0.25	24	24	25	37	40	65	68	72	122	142
PN 25/40	0.8 - 5/8/10	19	19	20	36	38	64	68	71	118	143
	0.2 - 1.2	21	21	22	38	40	66	70	73	120	145
	0.1 - 0.6	25	25	26	42	44	70	74	77	124	149
	0.02/0.05-0.25	25	25	26	40	42	68	72	75	130	155

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 604

Standard Cast Valve

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Inlet Pressure	up to 40 bar
Outlet Pressure	0.02 - 10 bar
K_{vs}-Value	4 - 160 m³/h
Temperature	250 °C
Medium	steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 604 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for high temperatures and large volumes. The valve cone is fitted with a metallic seal (up to 250 °C).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- balanced cone for controlling the outlet pressure indipendently from the initial pressure
- open spring
- pilot line connection

Options

- spring cap
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

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K_{vs}-Values [m³/h]										
DN	15	20	25	40	50	65	80	100	125	150
m³/h	4	5	6	20	32	50	80	100	140	160

Setting Ranges [bar]						
DN 15-50	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4.5 - 10
DN 65-100	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4 - 8
DN 125+150	0.05 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 3.5	2 - 5
PN	40/1	40/1	40/2.5	40/6	40/10	40/16

Pressure Control Valves

Pressure Reducing Valves DM 604

Standard Cast Valve

Materials	
Temperature	250 °C
Body	cast steel optional CrNiMo-steel
Diaphragm Housing	steel welded optional CrNiMo-steel
Spring Cap	steel welded optional CrNiMo-steel
Spring	spring steel C optional CrNi-steel
Diaphragm	EPDM
O-Ring (balance)	FXM

Dimensions [mm]

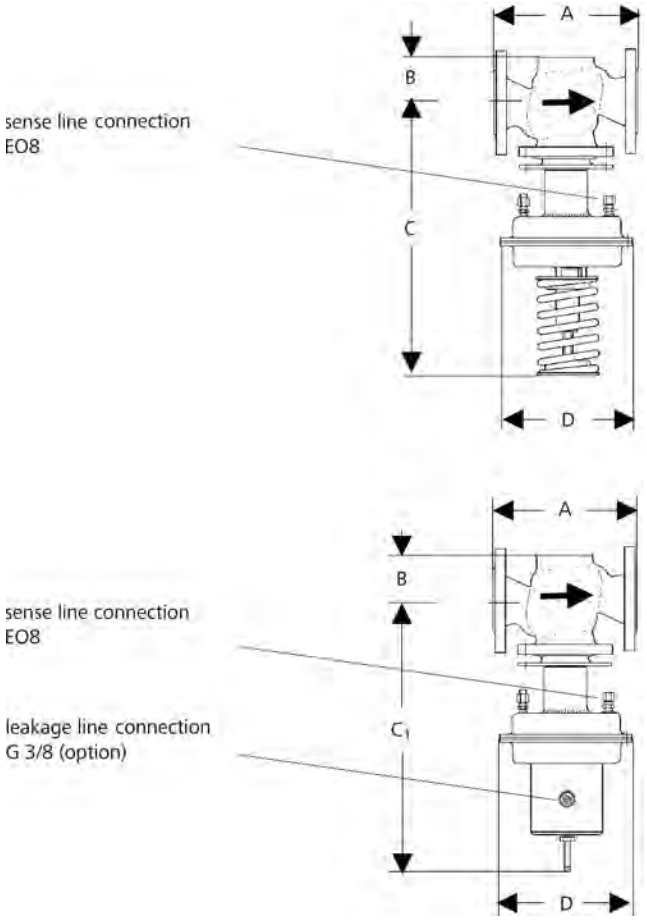
size	pressure range bar	nominal diameter DN									
		15	20	25	40	50	65	80	100	125	150
A	0.02-5/8/10	130	150	160	200	230	290	310	350	400	480
B		55	55	55	75	75	105	105	105	220	220
C	4.5 - 8/10	530	530	530	560	560	640	640	640	940	940
C_1	2 - 3.5/5	660	660	660	720	720	800	800	800	1100	1100
D	0.8 - 2.5	175	175	175	220	220	220	220	220	220	220
C	0.2 - 1.2	540	540	540	560	560	640	640	640	840	840
C_1		670	670	670	720	720	800	800	800	1000	1000
D		220	220	220	270	270	270	270	270	270	270
C	0.1 - 0.6	540	540	540	560	560	640	640	640	840	840
C_1		670	670	670	720	720	800	800	800	1000	1000
D		270	270	270	360	360	360	360	360	360	360
C	0.02/0.05 - 0.25	510	540	540	560	560	640	640	640	840	840
C_1		670	670	670	720	720	800	800	800	1000	1000
D		360	360	360	360	360	360	360	360	500	500

Weights [kg]

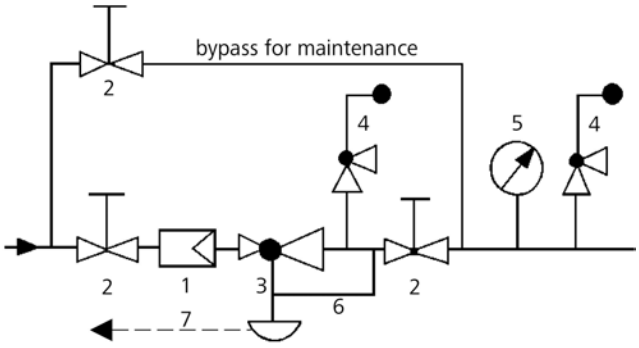
nom. pressure	pressure range bar	nominal diameter DN									
		15	20	25	40	50	65	80	100	125	150
PN 16	0.8 - 5/8/10	17	17	18	30	33	55	58	62	100	120
	0.2 - 1.2	19	19	20	32	35	57	60	64	102	122
	0.1 - 0.6	23	23	24	36	39	61	64	68	106	126
	0.02/0.05-0.25	23	23	24	34	37	59	62	66	112	132
PN 25/40	0.8 - 5/8/10	18	18	19	33	35	58	62	65	108	133
	0.2 - 1.2	20	20	21	35	37	60	64	67	110	135
	0.1 - 0.6	24	24	25	39	41	64	68	71	114	139
	0.02/0.05-0.25	24	24	25	37	39	62	66	69	120	145

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 613

Standard Cast Valve

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Inlet Pressure	up to 40 bar
Outlet Pressure	0.02 - 10 bar
K_{vs}-Value	4 - 160 m³/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 613 pressure reducing valve is a diaphragm-controlled spring-loaded and balanced proportional control valve for large volumes. The valve body is made of cast iron, the control mechanism is a welded assembly. The valve cone is fitted with a soft seal (up to 80/130 °C).

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- balanced cone for controlling the outlet pressure indipendently from the initial pressure
- open spring
- pilot line connection

Options

- spring cap
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

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K_{vs}-Values [m³/h]										
DN	15	20	25	40	50	65	80	100	125	150
m³/h	4	5	6	20	32	50	80	100	140	160

Setting Range [bar]						
DN 15-50	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4.5 - 10
DN 65-100	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4 - 8
DN 125+150	0.05 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 3.5	2 - 5
PN	40/1	40/1	40/2.5	40/6	40/10	40/16

Pressure Control Valves

Pressure Reducing Valves DM 613

Standard Cast Valve

Materials	
Temperature	130 °C
Body	cast steel optional CrNiMo-steel
Diaphragm Housing	steel welded optional CrNiMo-steel
Spring Cap	steel welded optional CrNiMo-steel
Spring	spring steel C optional CrNi-steel
Valve Seal	EPDM optional FPM
Diaphragm	EPDM optional FPM
O-Ring (balance)	EPDM optional FPM

Dimensions [mm]

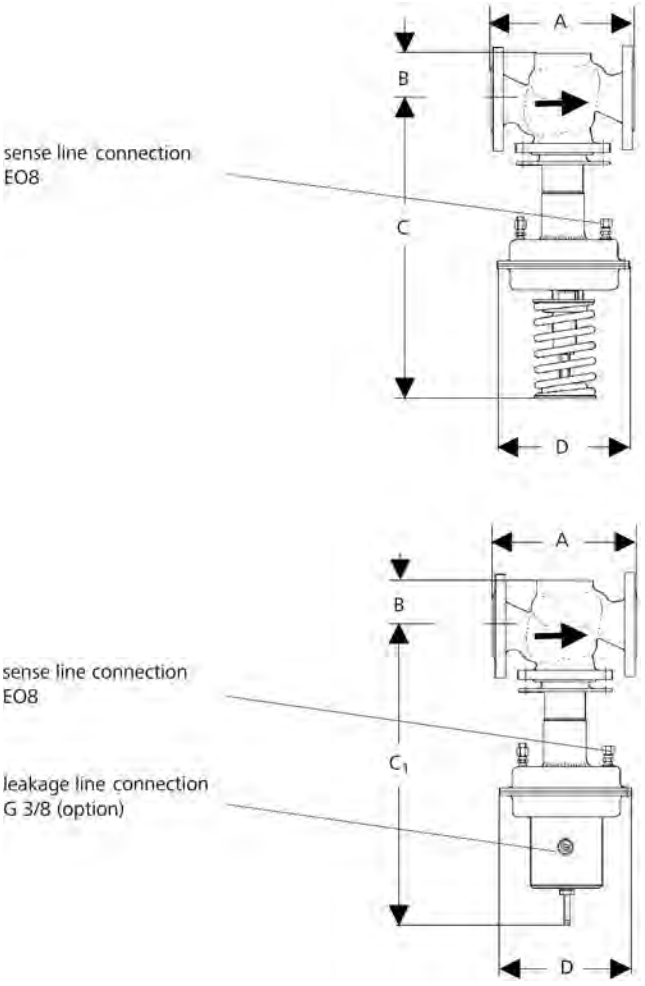
size	setting range bar	nominal diameter DN 15	20	25	40	50	65	80	100	125	150
A	0.02-5/8/10	130	150	160	200	230	290	310	350	400	480
B		55	55	55	75	75	105	105	105	220	220
C	4.5 - 8/10	520	520	520	680	680	760	760	760	940	940
C_1	2 - 3.5/5	650	650	650	840	840	920	920	920	1100	1100
D	0.8 - 2.5	175	175	175	220	220	220	220	220	220	220
C	0.2 - 1.2	540	540	540	680	680	760	760	760	840	840
C_1		670	670	670	840	840	920	920	920	1000	1000
D		220	220	220	270	270	270	270	270	270	270
C	0.1 - 0.6	540	540	540	680	680	760	760	760	840	840
C_1		670	670	670	840	840	920	920	920	1000	1000
D		270	270	270	360	360	360	360	360	360	360
C	0.02 / 0.05 -	540	540	540	560	560	640	640	640	840	840
C_1	0.25	670	670	670	720	720	800	800	800	1000	1000
D		360	360	360	360	360	360	360	360	500	500

Weights [kg]

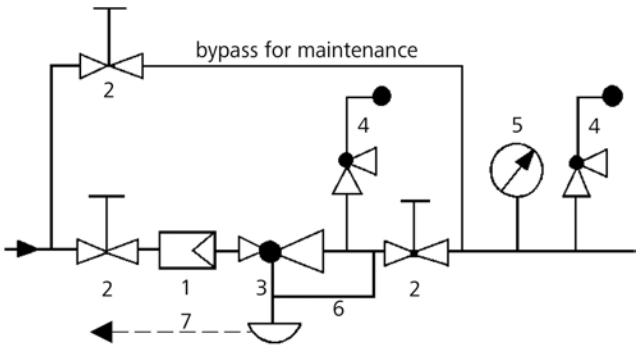
nom. pressure	setting range	nominal diameter DN 15	20	32	40	50	65	80	100	125	150
PN 16	0.8 - 5/8/10	17	17	18	30	33	55	58	62	100	120
	0.2 - 1.2	19	19	20	32	35	57	60	64	102	122
	0.1 - 0.6	23	23	24	36	39	61	64	68	106	126
	0.02/0.05-0.25	23	23	24	34	37	59	62	66	112	132
PN 25/40	0.8 - 5/8/10	18	18	19	33	35	58	62	65	108	133
	0.2 - 1.2	20	20	21	35	37	60	64	67	110	135
	0.1 - 0.6	24	24	25	39	41	64	68	71	114	139
	0.02/0.05-0.25	24	24	25	37	39	62	66	69	120	145

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8 (option)
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 620 - 628

High Pressure Valve, Medium and High Flow Rates

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16 - 315
Inlet Pressure	up to 315 bar
Outlet Pressure	2 - 160 bar
K_{vs}-Value	0.4 - 10 m³/h
Temperature	200 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 620 - 628 pressure reducing valves are diaphragm-controlled spring-loaded and balanced proportional control valves for high inlet and outlet pressures. They can be supplied with three types of connections: sockets, flanges or welding spigots. Each size of valve may be fitted with three different seats. The valve cone may be fitted with a soft or metallic seal.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» balanced cone for controlling the outlet pressure indipendently from the initial pressure

Options

» pressure gauge connection
» hard-faced valve cone and seat
» for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
» special connections: ANSI or JIS flanges, NPT, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Nominal Pressure, K_{vs}-Values, Setting Ranges and Permissible Reduction Ratio see page 3

Pressure Control Valves

Pressure Reducing Valves DM 620 - 628

High Pressure Valve, Medium and High Flow Rates

Materials			
Temperature	80 °C	130 °C	200 °C
Body	G 1/2 - 1, DN 15 - 25 = C-Stahl G 1 1/4 - 2, DN 32 - 50 = steel welded optional CrNiMo-steel for all diameters		
Spring Cap	steel welded optional CrNiMo-steel for all diameters		
Internals	CrNiMo-steel		
Spring	spring steel C optional CrNi-steel		
Soft Seal	EU	FPM optional EPDM or PTFE	
Metallic Seal	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Diaphragm	CR	FPM optional EPDM	-
Protection foil	PTFE (option)	PTFE (option)	-
O-ring for Piston	EPDM	FPM optional PTFE	FEPM optional PTFE
Bellow	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel

Dimensions [mm] for DM 620, DM 621 and DM 626					
type	size	nominal diameter			
		1/2	G 3/4 - 1	G 1 1/4-1 1/2	G 2
		DN 15	DN 20 - 25	DN 32 - 40	DN 50
620	A	140	170	250	250
621	A_1	220	220	280*	300*
626	A/A_1	220	220	acc. to DIN 3202 - S14	
alle	B	80	80	110	110
alle	C	< 520	< 520	< 800	< 800

* on request if the downstream pressure is ≥ PN 63

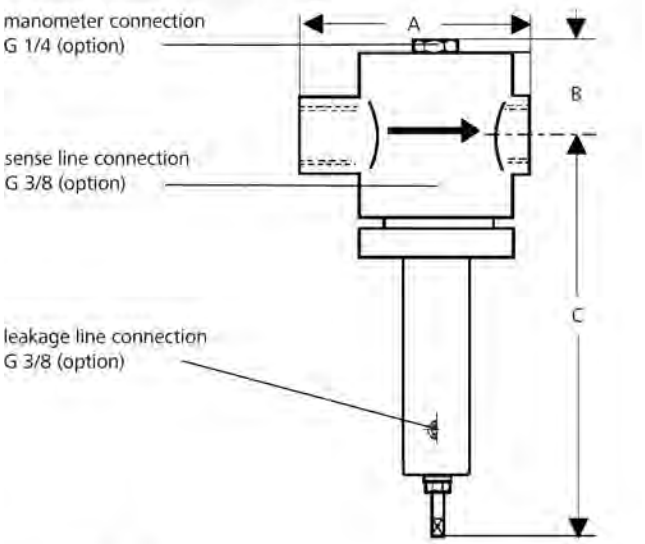
Dimensions [mm] for DM 624, DM 625 and DM 628	
size	all diameters
A / A_1	220
B	90
C	< 530

Weights [kg] for DM 620, all others on request					
nominal diameter					
1/2	3/4	1	1 1/4	1 1/2	2
13	14	15	21	21	21

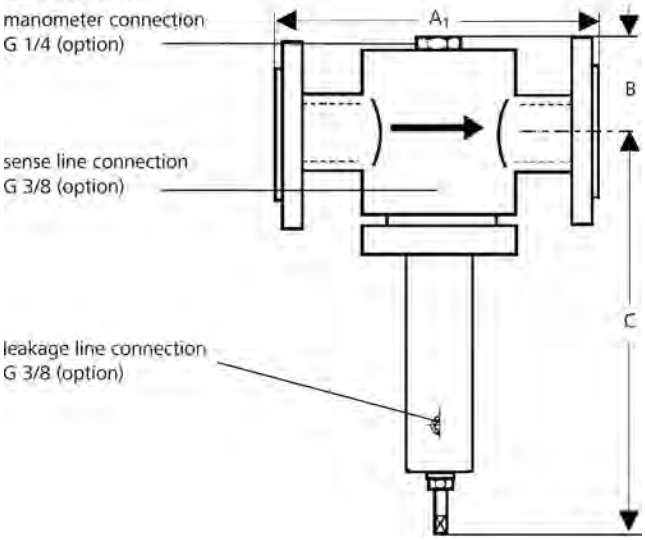
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

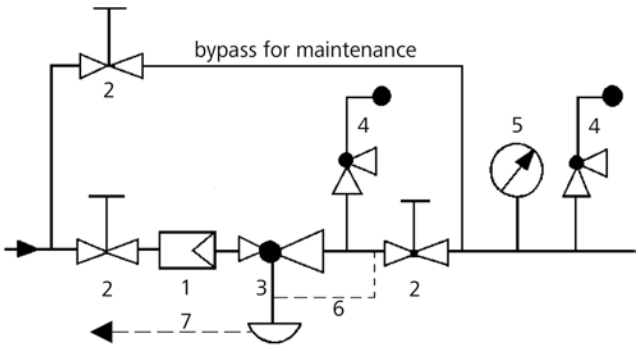
DM 620, DM 624, DM 626, DM 628



DM 621, DM 625



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure 'Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 3/8 (option)
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 620 - 628

High Pressure Valve, Medium and High Flow Rates

K_{vs} values[m^3/h]							
nominal diameter							
G		1/2	3/4	1	1 1/4	1 1/2	2
DN		15	20	25	32	40	50
seat	I	0.4	1.2	1.8	2.2	4.5	4.5
	II	1.2	1.8	2.2	4.5	7	7
	III	1.8	2.2	4.5	7	10	10

Setting Ranges [bar], Nominal Pressure DM 620, 621, 626				
2 - 4	4 - 7	7 - 10	5 - 16	10 - 20
PN 315/6	PN 315/16	PN 315/16	PN 315/25	PN 315/25
10 - 25	20 - 35	35 - 50	45 - 63	60 - 100
PN 315/40	PN 315/40	PN 315/63	PN 315/100	PN 315/100

Setting Ranges [bar], Nominal Pressure DM 624, 625, 628	
40 - 100	80 - 160
PN 315/100	PN 315/160

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Permissible Reduction Ratio (p_1/p_2) DM 620, 621, 626							
setting range bar	seat	nominal diameter					
		G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
		DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
2 - 4	I	160	80	60	120	58	58
	II	80	60	50	58	36	36
	III	60	50	30	36	24	24
4 - 7	I	160	80	60	78	38	38
	II	80	60	50	38	24	24
	III	60	50	30	24	16	16
7 - 10	I	64	50	42	56	28	28
	II	50	42	34	28	16	16
	III	42	34	18	16	12	12
5 - 16	I	64	50	42	66	32	32
	II	50	42	34	32	20	20
	III	42	34	18	20	14	14
10 - 20	I	53	42	35	56	28	28
	II	42	35	28	28	16	16
	III	35	28	15	16	12	12
10 - 25	I	40	36	34	36	18	18
	II	36	34	27	18	12	12
	III	34	27	14	12	8	8
20 - 35	I	32	28	26	30	14	14
	II	28	26	20	14	9	9
	III	26	20	8	9	6	6
35 - 50	I	24	20	18	22	11	11
	II	20	18	15	11	6	6
	III	18	15	7	6	5	5
45 - 63	I	19	16	14	16	8	8
	II	16	14	11	8	5	5
	III	14	11	6	5	3	3
60 - 100	I	16	14	12	16	8	8
	II	14	12	10	8	5	5
	III	12	10	5	5	3	3

Permissible Reduction Ratio (max. p_1/p_2) DM 624, 625, 628				
aetting range bar	seat	G 1/2 DN 15	G 3/4 DN 20	G1 DN 25
all ranges	I	8		
	II			
	III			

Pressure Control Valves

Pressure Reducing Valves DM 644

Epoxy-coated Cast Valve for medium Flow Rates

Technical Data

Connection DN	50 - 150
Nominal Pressure PN	16 - 40
Inlet Pressure	up to 40 bar
Outlet Pressure	1.5 - 6 or 5 - 12 bar
K_{vs}-Value	17 - 155 m³/h
Temperature	70 °C
Medium	water

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 644 pressure-reducing valve is a piston-controlled, spring-loaded proportional regulator with relief for large throughputs. The housing is made of spheroidal graphite iron with a continuous epoxy coating. The valve cone is soft-sealed.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- body made of spheroidal graphite iron with an epoxy coating
- closed spring cap
- internal control bore

Options

- pressure gauge pre-installed
- other outlet pressure ranges on request
- special designs on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values[m³/h]					
nominal diameter DN					
50	65	80	100	125	150
17	29	43	68	104	155

Setting Ranges [bar], Nominal Pressure PN, max. Permissible Reduction Ratio		
bar	1,5 - 6	5 - 12
PN	40/10	40/16
max. Δp	5 : 1	

Pressure Control Valves

Pressure Reducing Valves DM 644

Epoxy-coated Cast Valve for medium Flow Rates

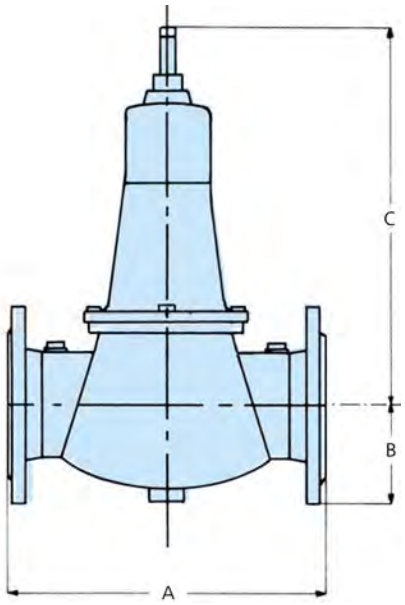
Materials	
Body	spheroidal cast iron epoxy coated
Spring Cap	spheroidal cast iron epoxy coated
Spring	stainless steel 55SiCr6
Internals	stainless steel
Valve Seal	NBR
O-ring (balance)	NBR

Dimensions [mm]						
size	nominal diamter DN					
	50	65	80	100	125	150
A	230	290	310	350	400	450
B	83	93	100	117	135	150
C	280	320	350	420	590	690

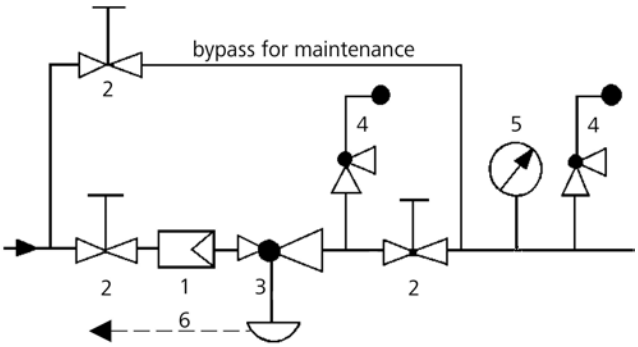
Weights [kg]					
nominal diameterDN					
50	65	80	100	125	150
12	19	24	34	56	74

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Pressure Reducer
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 652

Universal Valve

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16 - 40
Inlet Pressure	up to 40 bar
Outlet Pressure	0.02 - 12 bar
K_{vs}-Value	5 - 22 m^3/h
Temperature	190 °C
Medium	liquids, gases and steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 652 pressure reducing valve is a diaphragm-controlled spring-loaded and balanced proportional control valve for universal application. This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- non rising adjusting screw
- quick-release body clamp ring
- sense line connection
- diaphragm protectd by PTFE foil (only for pressure ranges 0.8 - 12 bar)
- balanced cone for controlling the outlet pressure indipendently from the initial pressure

Options

- pressure gauge connection
- pneumatic actuation
- internal sense line
- oil and grease-free version for oxygen
- clean gas version with special connections
- water-cooled thermal protection for steam up to 220 °C
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]							
nominal diameter	G	1/2	3/4	1	1 1/4	1 1/2	2
	DN	15	20	25	32	40	50
K_{vs}-value	m^3/h	5	7	8	22	22	22

Setting Ranges [bar], Nominal Pressure			
0.02-0.12	0.1-0.5	0.3-1.1	0.8-2.5
PN 16-40/1	PN 16-40/1	PN 16-40/2.5	PN 16-40/6

Setting Ranges [bar], Nominal Pressure		
2 - 5	4 - 8	6 - 12
PN 16-40/10	PN 16-40/16	PN 16-40/16

Permissible Reduction Ratio (max. $p_1/p_{2)}$		
setting ranges bar	nominal diameter	
	G 1/2 - 1	G 1 1/4 - 2
	DN 15 - 25	DN 32 - 50
0.02 - 0.12	80	50
0.1 - 0.5	40	25
0.3 - 1.1	30	18
0.8 - 12	20	12

Pressure Control Valves

Pressure Reducing Valves DM 652

Universal Valve

Materials		
Temperature	130 °C	for steam 190 °C
Body, Spring Cap, Internals, Screws	CrNiMo-steel	CrNiMo-steel
Spring	CrNi-steel	CrNi-steel
Valve Seal	FEPM optional EPDM or FPM	FEPM optional PTFE
Diaphragm	EPDM optional FPM	EPDM
Protection Foil	PTFE setting range 0,8 - 12 bar with FEPM-Weichdichtung: standard other ranges and soft seals: option	

Dimensions [mm]

pressure range bar	size	nominal diameter					
		G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
		DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
all ranges	A	85	91	85	130	145	185
	A_1	130	150	160	180	200	230
	B	76	76	76	90	90	90
0.02 - 0.12	C	300	300	300	300	300	300
	D	360	360	360	360	360	360
0.1 - 0.5	C	300	300	300	300	300	300
	D	264	264	264	264	264	264
0.3 - 1.1	C	300	300	300	300	300	300
	D	200	200	200	200	200	200
0.8 - 2.5	C	235	235	235	235	235	235
	D	138	138	138	138	138	138
2 - 5	C	235	235	235	235	235	235
	D	138	138	138	138	138	138
4 - 8	C	235	235	235	235	235	235
	D	138	138	138	138	138	138
6 - 12	C	235	235	235	235	235	235
	D	138	138	138	138	138	138

Weights [kg]

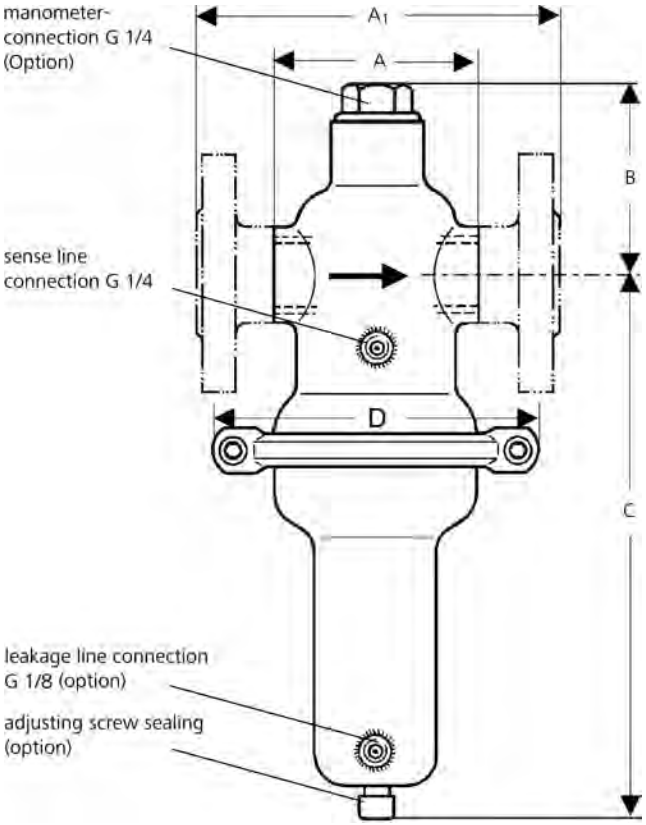
setting ranges bar	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
0.02 - 0.12	13.5	13.5	13.5	14.4	14.4	14.4
0.1 - 0.5	7.1	7.1	7.1	8	8	8
0.3 - 1.1	6.1	6.1	6.1	7	7	7
0.8 - 12	3.1	3.1	3.1	4	4	4

Weights [kg]

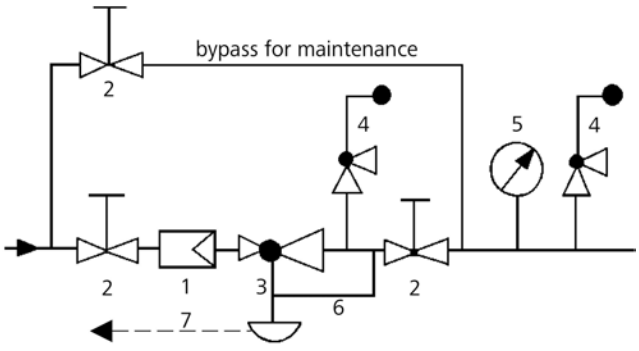
setting ranges bar	nominal diameter DN					
	15	20	25	32	40	50
0.02 - 0.12	15.3	15.3	15.3	18.4	18.4	18.4
0.1 - 0.5	8.9	8.9	8.9	12	12	12
0.3 - 1.1	7.9	7.9	7.9	11	11	11
0.8 - 12	4.9	4.9	4.9	8	8	8

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/4
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 662

Universal Valve for Medium Flow Rate

Technical Data

Connection DN	15 - 25
Connection G	1/2 - 1
Nominal Pressure PN	100
Inlet Pressure	up to 100 bar
Outlet Pressure	0.02 - 12 bar
K_{vs}-Value	3.2 - 3.6 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 662 pressure reducing valve is a diaphragm-controlled spring-loaded and balanced proportional control valve for universal application and medium volumes.
This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

A sense line is required for outlet pressures ≤ 1.1 bar (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- non rising adjusting screw
- quick-release body clamp ring
- sense line connection (only for outlet pressures ≤ 1.1 bar)
- balanced cone for controlling the outlet pressure indipendently from the initial pressure

Options

- pressure gauge connection
- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

Kvs-Values [m^3/h]				
nominal diameter	DN	15	20	25
	G	1/2	3/4	1
K_{vs}-value	m^3/h	3.2	3.5	3.6

Setting Ranges, Nominal Pressure, Reduction Ratio				
setting range [bar]	6 - 12	4 - 8	2 - 5	0.8 - 2.5
nominal pressure PN	BSP female connection			
	100/16	100/16	100/10	100/6
	flange connection			
	40/16	40/16	40/10	40/6
p_1/p_2 max.	15	15	20	45

Setting Ranges, Nominal Pressure, Reduction Ratio			
setting range [bar]	0.3 - 1.1	0.1 - 0.5	0.02 - 0.12
nominal pressure PN	BSP female connection		
	100/2.5	100/1	100/1
	flange connection		
	40/2.5	40/1	40/1
p_1/p_2 max.	60	150	510

Pressure Control Valves

Pressure Reducing Valves DM 662

Universal Valve for Medium Flow Rate

Materials	
Temperature	130 °C
Body, Spring Cap, Spring, Diaphragm Housing, Internals, Screws	CrNiMo-steel
Valve Seal	EPDM optional FPM or PTFE
Diaphragm	EPDM optional FPM or PTFE
O-Ring	EPDM optional FPM or PTFE
Protection Foil (option)	PTFE

Dimensions [mm]

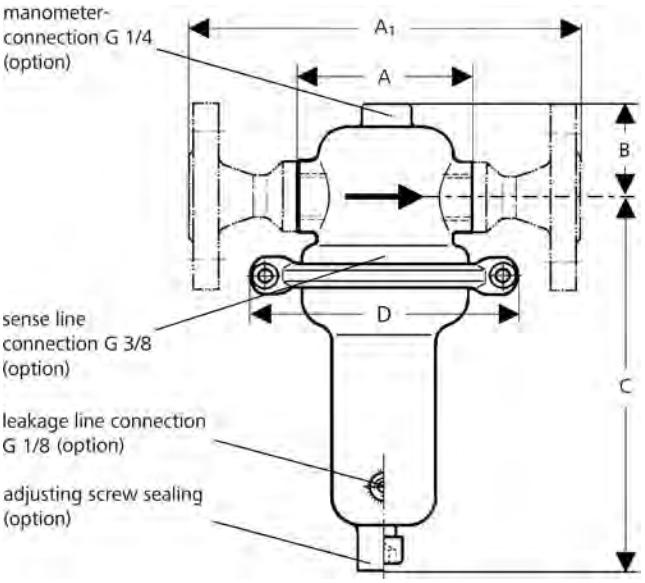
pressure range bar	size	nominal diameter		
		G 1/2	G 3/4	G 1
		DN 15	DN 20	DN 25
all ranges	A	90	90	136
	A_1	200	200	200
	B	40	40	40
0.02 - 0.12	C	270	270	270
	D	360	360	360
0.1 - 0.5	C	270	270	270
	D	264	264	264
0.3 - 1.1	C	270	270	270
	D	200	200	200
0.8 - 2.5	C	205	205	205
	D	138	138	138
2 - 5	C	205	205	205
	D	138	138	138
4 - 8	C	205	205	205
	D	138	138	138
6 - 12	C	205	205	205
	D	138	138	138

Weights [kg]

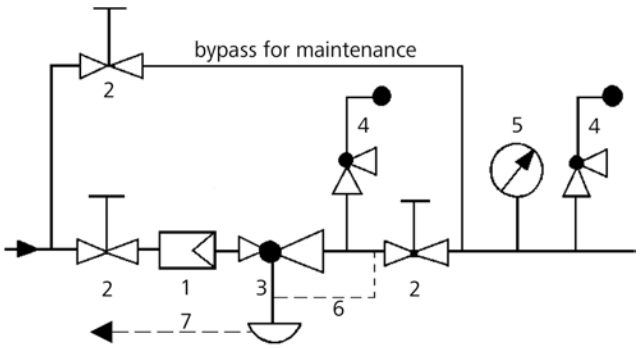
setting range bar	nominal diameter G			nominal diameter DN		
	1/2	3/4	1	15	20	25
0.02 - 0.12	13	13	13	14	14	14
0.1 - 0.5	6.5	6.5	6.5	7.5	7.5	7.5
0.3 - 1.1	5.5	5.5	5.5	6.5	6.5	6.5
0.8 - 12	2.5	2.5	2.5	3.5	3.5	3.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 3/8 (option)
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 664

Valve for Large Flow Rates

Technical Data

Connection DN	50 - 100
Nominal Pressure PN	16
Inlet Pressure	up to 16 bar
Outlet Pressure	0.02 - 8 bar
K_{vs}-Value	32 - 100 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 664 pressure reducing valve is a diaphragm-controlled spring-loaded and balanced proportional control valve for large volumes of non-hazardous media.
This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal (up to 130 °C).

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- quick-release body clamp ring
- sense line connection
- balanced cone for controlling the outlet pressure indipendently from the initial pressure

Options

- pressure gauge connection
- for toxic or hazardous media: additional leakage line connection. Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]			
nominal diameter DN			
50	65	80	100
32	50	80	100

Setting Ranges [bar], Nominal Pressure PN			
0.02 - 0.15	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2
16/1	16/1	16/1	16/2.5

Setting Ranges [bar], Nominal Pressure PN		
0.8 - 2.5	2 - 5	4 - 8
16/6	16/10	16/16

Pressure Control Valves

Pressure Reducing Valves DM 664

Valve for Large Flow Rates

Materials	
Temperature	130 °C
Body, Diaphragm Housing, Internals	CrNiMo-steel
Spring	CrNi-steel
Valve Seal	EPDM optional FPM or PTFE
Diaphragm	EPDM optional FPM
O-Ring	EPDM optional FPM

Dimensions [mm]

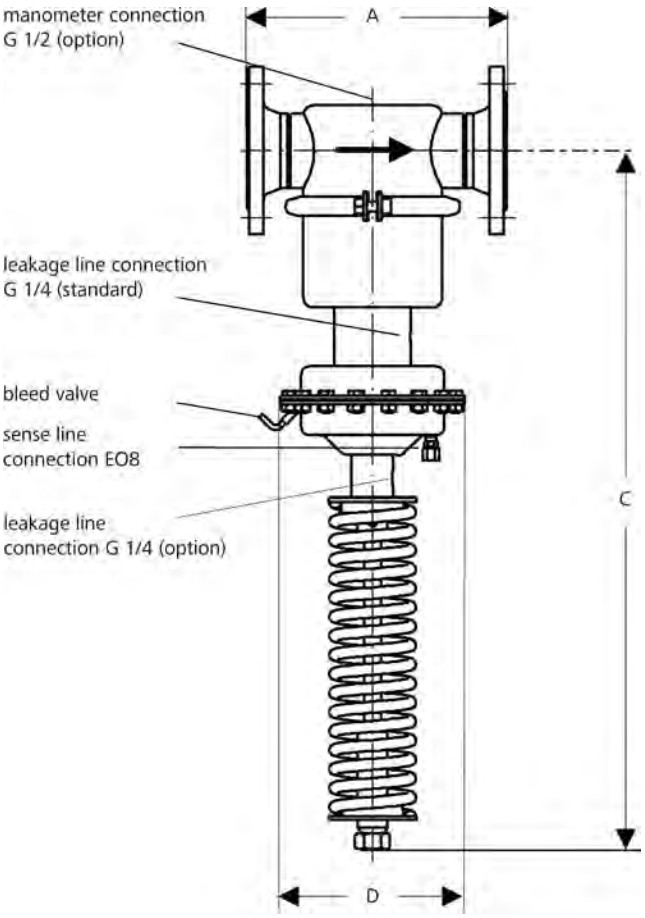
setting range bar	size	nominal diameter DN			
		50	65	80	100
all ranges	A	230	290	310	350
0.02 - 0.15	C	650	700	700	700
	D	500	500	500	500
0.02 - 0.25	C	650	700	700	700
	D	360	360	360	360
0.1 - 0.6	C	740	790	790	790
	D	360	360	360	360
0.2 - 1.2	C	740	790	790	790
	D	270	270	270	270
0.8 - 2.5	C	740	790	790	790
	D	220	220	220	220
2 - 5 4 - 8	C	740	790	790	790
	D	220	220	220	220

Weights [kg]

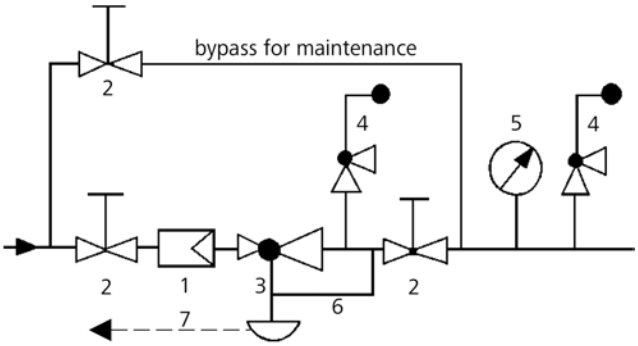
setting range bar	nominal diameter DN			
	50	65	80	100
0.02 - 0.15	40	41	43	45
0.02 - 0.25	40	41	43	45
0.1 - 0.,6	37	38	40	42
0.2 - 5 / 4 - 8	34	35	37	39

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8
7 Leakage Line G 1/4 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 668E

Pressure Regulating Hydrant Valve for Sea Water

Technical Data

Connection DN	40
Nominal Pressure PN	20/10
Inlet Pressure	9 - 20 bar
Outlet Pressure adjustable	6 - 8.5 bar
K_{vs}-Value	14 m^3/h
Temperature	50 °C
Medium	liquids

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The pressure reducing valve DM 668E is a diaphragm-controlled, spring-loaded proportional valve for medium flow rates. The valve has been made of deep-drawn titanium grade 2 with excellent corrosion resistance. The pipe-shaped inlet connection of the casing has been provided with the seat bore. The soft seal cone is guided in the seat part and is connected with the regulating diaphragm. The valve can be manually shut off by means of the hand wheel.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Standard

» medium wetted parts made of Titanium
» spring cap made of CrNiMo-steel
» quick-release body clamp ring
» non rising adjusting screw

Options

» a variety of connections with fire hose couplings typical for the country in question
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} values [m^3/h]
14

Setting Ranges [bar]
6 - 8.5

Pressure Control Valves

Pressure Reducing Valves DM 668E

Pressure Regulating Hydrant Valve for Sea Water

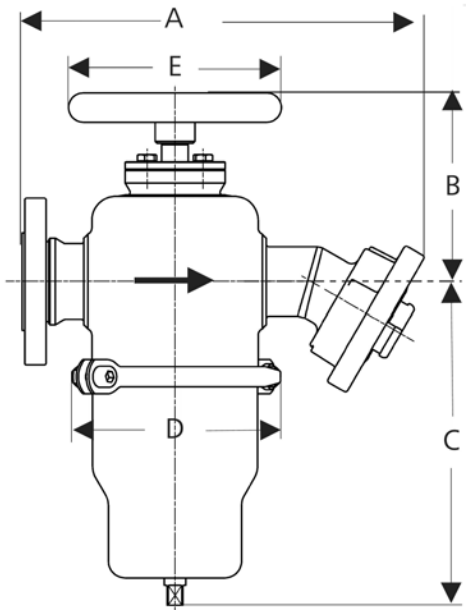
Materials- Main Valve	
Temperature	50 °C
Body	Titanium Grade 2
Spring Cap	CrNiMo-steel
Inner Parts	Titanium
Set Screw	CrNiMo-steel
Spring	CrNi-steel
Valve Seal	EPDM
Diaphragm	EPDM
Profile Clamp	CrNiMo-steel

Dimensions		
size	G 2 1/2	incl. Storz
A	272	302
B	142	142
C	244	244
D	157	157
E	160	160

Weights [kg]	
G 2 1/2	incl. Storz
8.9	10

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pressure Control Valves

Pressure Reducing Valves DM 6901

Piston-Controlled Mini Pressure Reducing Valve

Technical Data

Connection G / NPT	1/8
Outlet Pressure	0 - 100 bar
Inlet Pressure	up to 300 bar
K_{vs}-Value	0.05 m³/h
C_{vs}-Value	0.06 US gal/min.
Medium	gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 6901 pressure reducing valve is a piston controlled proportional control valve for lowest flow rates. The valve provides accurate control with a lightweight and compact design (minimal dimensions). Body, spring cap and medium wetted parts are made of stainless steel (316) featuring excellent corrosion resistance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Turning the handwheel clockwise increases the outlet pressure.

Standard

» SS316 body and spring cap
» SS316 medium wetted parts

Options

» Nylon handwheel
» counter nut for panel mounting
» pneumatic actuation
» outlet pressure range 0 - 210 bar

Application

» analyser systems
» point of use
» instrumentation control
» gas sticks
» lecture bottle assembly

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Kvs value [m³/h]	Cvs value [US gal/min.]
0.05	0.06

Setting Ranges [bar]			
0 - 1	0 - 10	0 - 50	0 - 100

Pressure Control Valves

Pressure Reducing Valves DM 6901

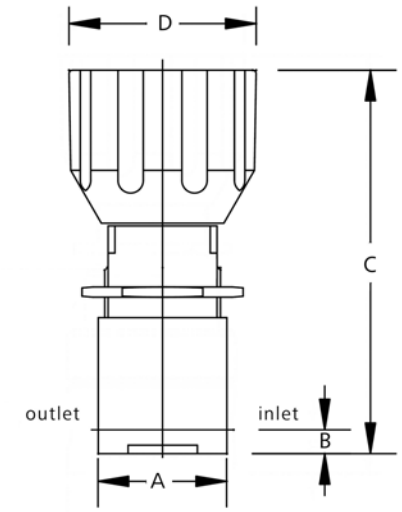
Piston-Controlled Mini Pressure Reducing Valve

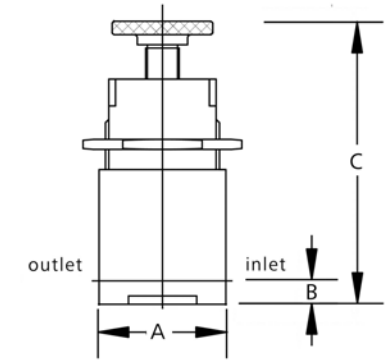
Materials	
Body, Spring Cap	CrNiMo-steel
Medium Wetted Parts	CrNiMo-steel
Seat	PCTFE
O-Ring	Viton
Handwheel	Nylon
Adjusting Screw	Ali Bronze

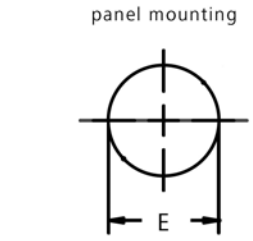
Dimensions [mm] and Weights [kg]		
size	without handwheel	with handwheel
A	38	38
B	7	7
C	84.3	112.8
D	-	56
E	35	35
kg	0.39	0.45

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing







Pressure Control Valves

Pressure Reducing Valves DM 6902, 6904

Diaphragm or Piston Controlled

Technical Data

Connection G / NPT	1/4
Outlet Pressure	0 - 35 bar (DM 6902) 0 - 180 bar (DM 6904)
Inlet Pressure	up to 300 bar
K_{vs}-Value	0.05 m³/h
C_{vs}-Value	0.06 US gal/min.
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 6902 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for setting ranges up to 35 bar. The especially developed Inconel X750 diaphragm lasts at least 50% longer than typical stainless steel designs. The DM 6904 pressure reducer is piston-controlled and can be used for setting ranges up to 180 bar. Body and spring cap are made of stainless steel (316) featuring excellent corrosion resistance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Turning the handwheel clockwise increases the outlet pressure.

Standard

» 316SS body and spring cap
» Nylon handwheel
» bubble tight at max. working pressure (tested with Nitrogen)

Options

» counter nut for panel-mounting
» special versions on request

Application

» gas and liquid analyzer systems
» gas cylinder regulator assemblies
» portable calibration kits
» laboratories & research labs
» low pressure hydraulic systems
» pressure test rigs
» instrument air lines
» aircraft service carts

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Kvs Value [m³/h]	Cvs Value [US gal/min.]
0.05	0.06

Setting Ranges DM 6902 [bar]			
0 - 5	0 - 10	0 - 20	0 - 35

Setting Ranges DM 6904 [bar]		
0 - 50	0 - 100	0 - 180

Pressure Control Valves

Pressure Reducing Valves DM 6902, 6904

Diaphragm or Piston Controlled

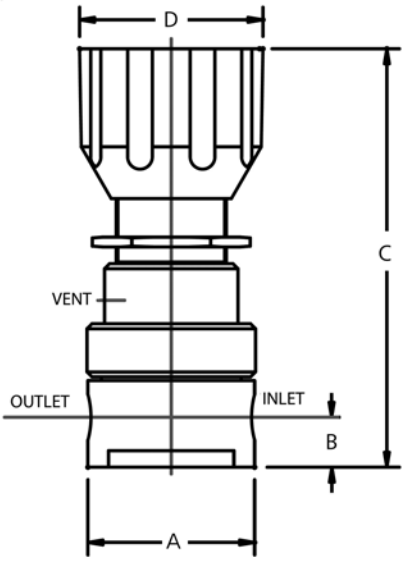
Materials	
Body, Spring Cap	CrNiMo-steel
Main Valve Pin	CrNiMo-steel
Spring	Inconel X750
Loading Spring	CrNi-steel
Valve Seal	PEEK or PCTFE
Diaphragm	Inconel X750
Diaphragm Washer	Brass
O-Rings	Viton
Handwheel	Nylon
Adjusting Screw	Ali Bronze

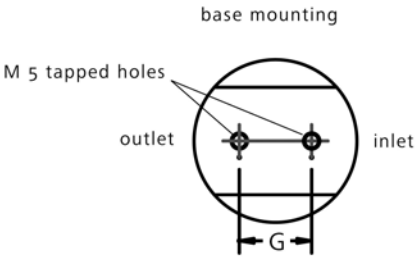
Dimensions [mm]		
size	DM 6902	DM 6904
A	50	50
B	15	12.7
C_{min}	117.6	125.6
C_{max}	125.6	133.6
D	55	55

Weights [kg]	
DM 6902	DM 6904
0.9	1.0

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Pressure Control Valves

Pressure Reducing Valves DM 6914

Piston Controlled „Low flow“ Pressure Reducer

Technical Data

Connection G / NPT	1/4, 3/8
Outlet Pressure	0 - 414 bar
Inlet Pressure	up to 550 bar
K_{vs}-Value	0.09 or 0.17 m^3/h
C_{vs}-Value	0.1 or 0.2 US gal/min.
Medium	gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 6914 pressure reducing valve is a piston-controlled spring-loaded proportional control valve with precision machined sensing elements to allow fine pressure control on pressures up to 414 bar. Body and spring cap are made of stainless steel (316) featuring excellent corrrosion resistance. Optional with segregated captured vent.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Turning the handwheel clockwise increases the outlet pressure.

Standard

» SS316 body and spring cap
» Nylon handwheel
» Bubble tight at max. working pressure (tested on Nitrogen)

Options

» panel mounting ring
» segregated captured vent
» special designs on request

Application

» test and calibration systems
» aircraft charging carts
» valve actuator systems
» gas cylinder regulator assemblies

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Kvs values [m^3/h]	Cvs values [US gal/min.]
0.09 or 0.17	0.1 or 0.2

Setting Ranges [bar]			
0 - 50	0 - 100	0 - 200	0 - 414

Pressure Control Valves

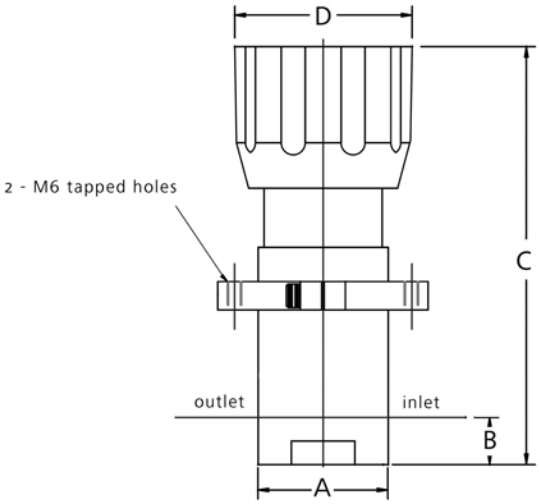
Pressure Reducing Valves DM 6914

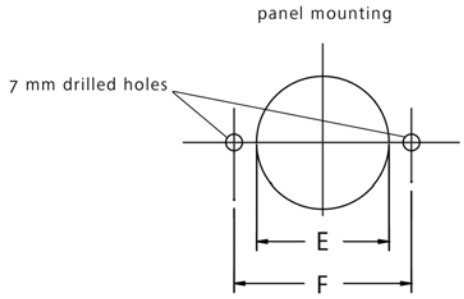
Piston Controlled „Low flow“ Pressure Reducer

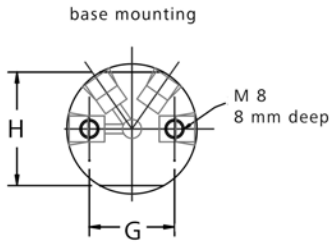
Materials	
Body, Spring Cap	CrNiMo-steel
Main Valve Pin	CrNiMo-steel
Spring	Inconel X750
Loading Spring	CrNi-steel
Seat	PEEK GF30
Diaphragm	Inconel X750
Diaphragm Washer	brass
O-Rings	NBR, Viton or EPDM
Handwheel	Nylon
Set Screw	Ali Bronze

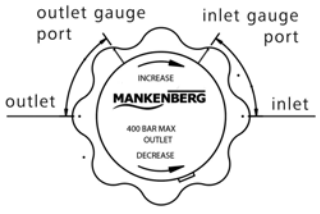
Dimensions [mm] and Weights [kg]	
size	nominal diameter G 1/4 or G 3/8
A	55
B	20
C	177
D	75
E	56
F	75
G	36
H	48
kg	2.1

Dimensional Drawing









Pressure Control Valves

Pressure Reducing Valves DM 6916

Piston Controlled, with Ceramic Seat and Cone

Technical Data

Connection G / NPT	1/4 - 1/2
Outlet Pressure	0 - 1380 bar
Inlet Pressure	up to 1380 bar
K_{vs}-Value	0.04 or 0.09 m³/h
C_{vs}-Value	0.05 or 0.1 US gal/min.
Medium	liquids

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 6916 pressure reducing valve is a piston-controlled spring-loaded proportional control valve for set pressures up to 1380 bar. The ceramic seat and the ceramic shuttle ball tip cone reduce downtime, it lasts 5 times longer than tungsten carbid. The special design eleminates unstable resonances and avoids chattering of the valve. Body and spring cap are made of stainless steel (316) featuring excellent corrosion resistance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Turning the handwheel clockwise increases the outlet pressure.

Standard

- 316SS body and spring cap
- Nylon handwheel
- ceramic seat
- ceramic shuttle ball tip
- segregated captured vent

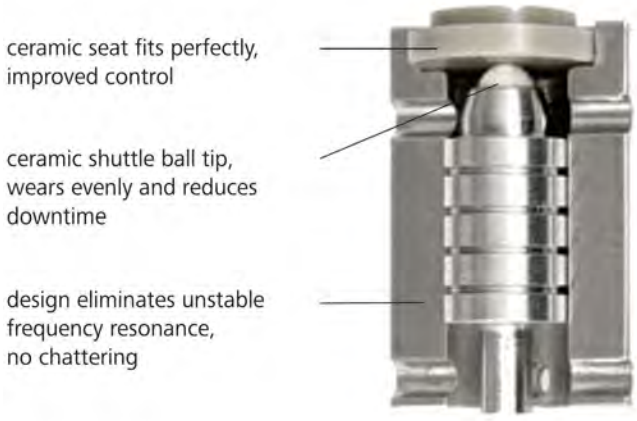
Options

- air-actuated
- panel mounting rings
- special versions on request

Application

- wellhead logic and control systems
- subsea valve actuator control
- valve test rigs
- liquid sampling
- hydraulic power packs

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



Kvs Value[m³/h]	Cvs Value[US gal/min.]
0.04 or 0.09	0.05 or 0.1

Pressure Ranges [bar]						
0 - 50	0 - 100	0 - 200	0 - 414	0 - 690	0 - 1034	0 - 1380

Pressure Control Valves

Pressure Reducing Valves DM 6916

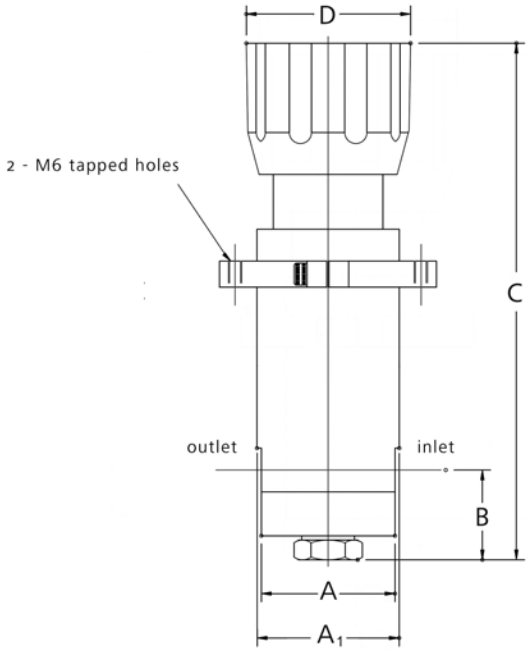
Piston Controlled, with Ceramic Seat and Cone

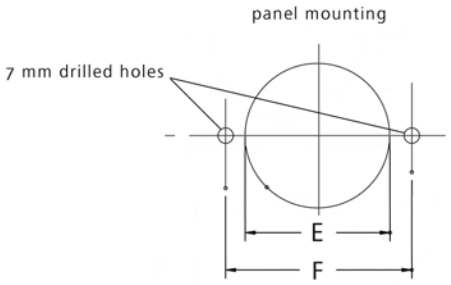
Materials	
Body, Spring Cap	CrNiMo-steel
Main Valve	Ceramic
Seat	Ceramic
Spring	302SS
Loading Spring	spring steel
O-Rings	NBR, Viton or EPDM
Handwheel	Nylon
Set Screw	Ali Bronze

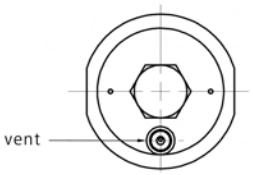
Dimensions [mm] and Weights [kg]	
size	nominal diameter G 1/4, G 1/2 or G 3/8
A	55
A_1	65
B	20
C	177
D	75
E	66
F	75
kg	4.8

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing







Pressure Control Valves

Pressure Reducing Valves DM 6917

Piston Controlled High Pressure Valve for Gases

Technical Data

Connection G / NPT	1/4 - 1/2
Outlet Pressure	0 - 690 bar
Inlet Pressure	up to 690 bar
K_{vs}-Value	0.09 m³/h
C_{vs}-Value	0.1 US gal/min.
Medium	gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 6917 pressure reducing valve is piston-controlled spring-loaded control valve for gases and controls pressures up to 690 bar. The segregated captured vent valve allows safe piping away of vented gas. Body and spring cap are made of stainless steel (316) featuring excellent corrosion resistance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Turning the handwheel clockwise increases the outlet pressure.

Standard

- body and spring cap made of CrNiMo-steel
- Nylon handwheel
- Segregated captured vent

Options

- pneumatic actuation
- panel mounting rings
- special versions on request

Application

- pneumatic test systems
- aircraft charging carts
- diving systems
- calibration kits

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Kvs Value [m³/h]	Cvs Value [US gal/min.]
0.09	0.1

Pressure Ranges [bar]				
0 - 50	0 - 100	0 - 200	0 - 414	0 - 690

Pressure Control Valves

Pressure Reducing Valves DM 6917

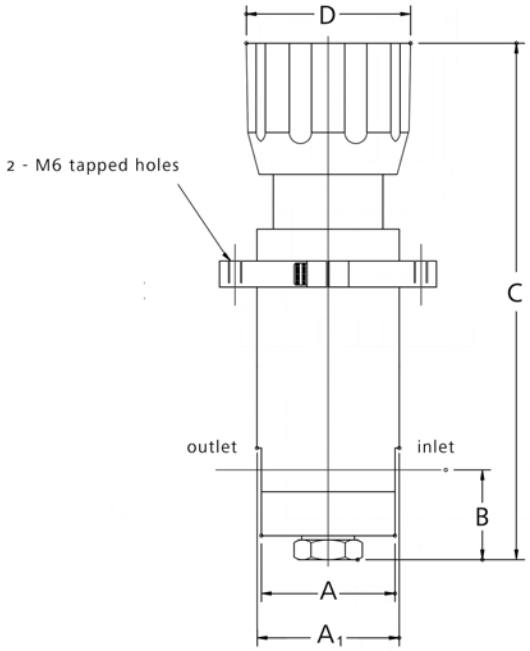
Piston Controlled High Pressure Valve for Gases

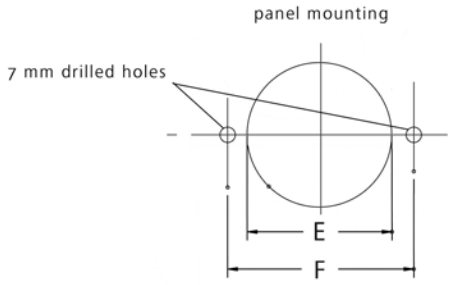
Materials	
Body	CrNiMo-steel or 17-4PH SS
Spring Cap	CrNiMo-steel
Main Valve	CrNiMo-steel
Seat Cartridge	PEEK
Spring	302SS
Loading Spring	spring steel
O-Rings	NBR, Viton or EPDM
Handwheel	Nylon
Set Screw	Ali Bronze

Dimensions [mm] and Weights [kg]	
size	nominal diameter G 1/4, G 3/8 or G 1/2
A	61
A_1	65
B	41
C	236
D	75
E	66
F	85
kg	4.8

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Pressure Control Valves

Pressure Reducing Valves DM 701

Valve for High Pressures for Small Flow Rates

Technical Data

Connection DN	15 - 50
Nominal Pressure PN	315
Inlet Pressure	up to 160 bar
Outlet Pressure	0.5 - 40 bar
K_{vs}-Value	0.2 - 5.5 m^3/h
Temperature	500 °C
Medium	steam

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 701 pressure reducing valve is a piston controlled, spring loaded proportional control valve for small capacities with high pressure drops. The valve cone is fitted with a metallic seal.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» open spring
» sense line connection

Options

» mid section for higher temperatures (400 - 500 °C)
» various diaphragm and seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]

seat	nominal diameter DN					
	15	20	25	32	40	50
I	0.2	0.25	0.25	0.4	0.4	1
II	0.9	0.9	0.9	2.5	2.5	3.5
III	1.8	2	2.2	3.9	3.9	5.5

Pressure Control Valves

Pressure Reducing Valves DM 701

Valve for High Pressures for Small Flow Rates

Materials PN 16	
Temperature	300°C
Body	cast steel
Bottom Part	cast steel
Spring	spring steel C
Internals	on request
Piston	
O-Ring	NBR or EPDM

Materials PN 25 - 40			
Temperature	300°C	350°C	400°C
Body	cast steel	cast steel	cast steel
Bottom Part	cast steel	cast steel	cast steel
Mid Section	-	-	GS 17 CrMo 55
Spring	spring steel C	spring steel C	spring steel C
Internals	on request		
Piston			
O-Ring	NBR or EPDM	NBR or EPDM	NBR or EPDM

Materials PN 63 - 315			
Temperature	350°C	400°C	500°C
Body	C 22 N	C 22 N	10 CrMo 9-10
Bottom Part	cast steel	cast steel	cast steel
Mid Section	-	GS 17 CrMo 55	GS 17 CrMo 55 or 10 CrMo 9-10
Spring	spring steel C	spring steel C	spring steel C
Internals	on request		
Piston			
O-Ring	NBR or EPDM	NBR or EPDM	NBR or EPDM

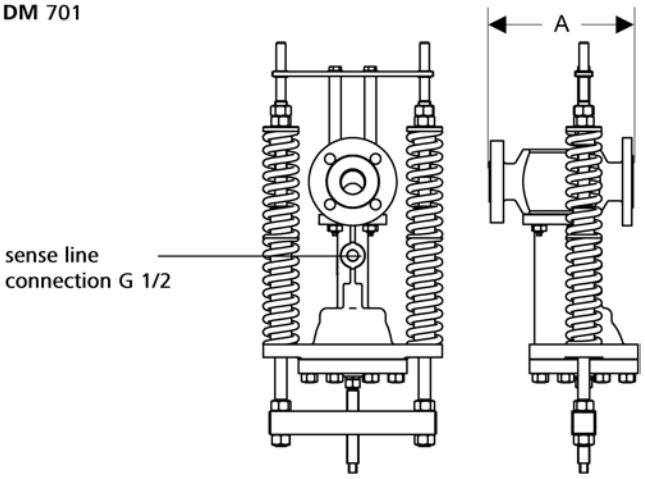
Dimensions [mm]							
nominal pressure	size	nominal diameter DN					
		15	20	25	32	40	50
PN 16 - 40	A	130	150	160	180	200	230
PN 63 - 160		210	230	230	260	260	300
PN 250 - 315		210	260	260	300	300	350

As the DM 701 pressure reducing valve is designed specifically for your operating data and may vary considerably in terms of construction, we are unable at this stage to give any dimensions or weights. Please contact us if you have specific queries.

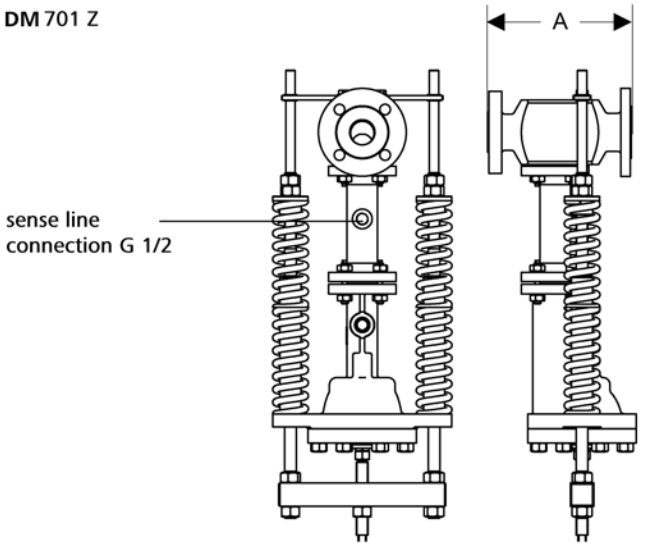
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

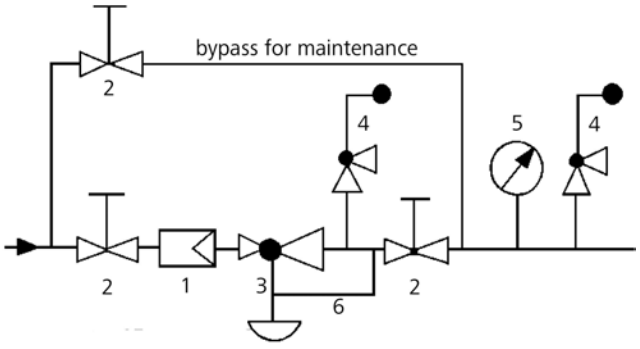
DM 701



DM 701 Z



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 762

Millibar Control Valve

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16
Inlet Pressure	up to 16 bar
Outlet Pressure	0.002 - 0.52 bar
K_{vs}-Value	0.2 - 3.6 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 762 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for very small outlet pressures and large volumes.
This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

The valves requires a sense line (to be installed on-site).

We recommend that G 1 and G 1½ or DN 25 and DN 40 connections be used.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- sense line connection

Options

- pressure gauge connection
- oil and grease-free version for oxygen
- clean gas version with special connections
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h] for all body sizes					
0.2	0.9	1.5	2.2	2.8	3.6

Setting Ranges [bar] diaphragm diameter 500 mm			
0.002 - 0.003	0.003 - 0.015	0.008 - 0.03	0.012 - 0.07

Setting Ranges [bar] diaphragm diameter 360 mm			
0.004 - 0.006	0.005 - 0.032	0.015 - 0.06	0.025 - 0.14

Setting Ranges [bar] diaphragm diameter 270 mm			
0.008 - 0.016	0.015 - 0.065	0.02 - 0.12	0.05 - 0.28

Setting Ranges [bar] diaphragm diameter 220 mm			
0.015 - 0.030	0.025 - 0.125	0.05 - 0.22	0.1 - 0.52

Permissible Reduction Ratio (max. p_1/p_2)						
diaphragm diameter	K_{vs}-value [m^3/h]					
	0.2	0.9	1.5	2.2	2.8	3.6
500	15000	7500	4500	2200	1500	1100
360	8000	4000	2500	1200	800	650
270	4000	2000	1250	600	400	320
220	2200	1100	660	320	210	170

Pressure Control Valves

Pressure Reducing Valves DM 762

Millibar Control Valve

Materials		
Temperature	80 °C	130 °C
Body, Spring Cap, Internals, Screws	CrNiMo-steel	CrNiMo-steel
Adjusting Screw	CrNiMo-steel M10 with handwheel made of Duroplast	
Spring	CrNi-steel	CrNi-steel
Valve Seal	FPM	FPM
Diaphragm	NBR	EPDM

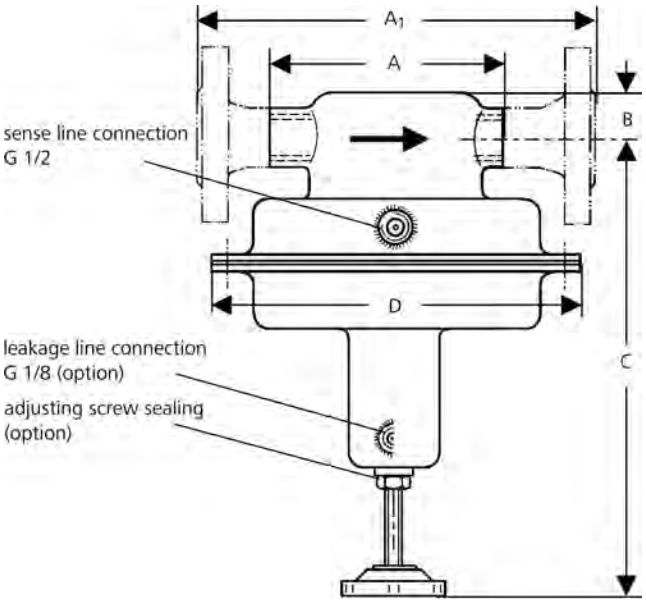
Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A	165	170	170	180	180	180
B	35	35	35	40	45	50
C	320	330	330	340	350	360
D	= diaphragm diameter see table pressure ranges					

Dimensions [mm]						
size	nominal diameter DN					
	15	20	25	32	40	50
A_1	240	240	250	250	260	260
B	35	35	35	40	45	50
C	320	330	330	340	350	360
D	= diaphragm diameter see table pressure ranges					

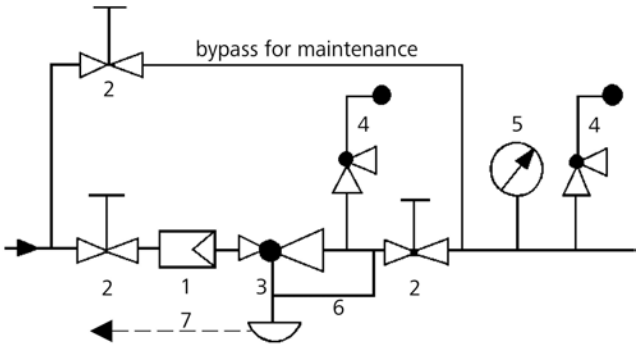
Weights [kg]			
diaphragm diameter	nominal diameter		
	G 1/2 - 2	DN 15 - 25	DN 32 - 50
500	13	15	17
360	12.5	14.5	16.5
270	8	10	12
220	6	8	10

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pressure Reducing Valves DM 765

Millibar Control Valve

Technical Data

Connection G	G 1/2
Nominal Pressure PN	16
Inlet Pressure	up to 8 bar
Outlet Pressure	0.03 - 0.8 bar
K_{vs}-Value	0.2 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The DM 765 pressure reducing valve is a diaphragm-controlled spring-loaded proportional control valve for very small outlet pressures and small volumes.
This pressure reducer is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

For correct functioning the valve requires a minimum pressure drop of 1 bar (p_1 - p_2).

If a larger valve is needed, please select DM 762 (K_{vs} rating up to 3.6 m^3/h).

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- quick-release body clamp ring

Options

- pressure gauge connection
- oil and grease-free version for oxygen
- clean gas version with special connections
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h] for all body sizes
0.2

Setting Ranges [bar]		
0.03 - 0.12	0.08 - 0.32	0.2 - 0.8

Pressure Control Valves

Pressure Reducing Valves DM 765

Millibar Control Valve

Materials		
Temperature	80 °C	130 °C
Body, Spring Cap, Internals, Screws	CrNiMo-steel	CrNiMo-steel
Spring	CrNi-steel	CrNi-steel
Valve Seal	FPM	FPM
Diaphragm	NBR	EPDM optional FPM

Dimensions [mm]	
size	nominal diameter
	G 1/2
A	140
B	~20
C	~130
D	138

Weights [kg]
1.5

Special designs on request.
The pressure has always been indicated as overpressure.
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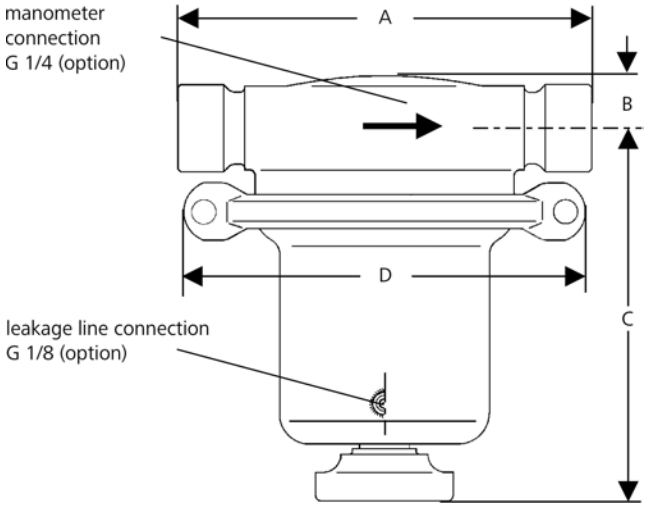
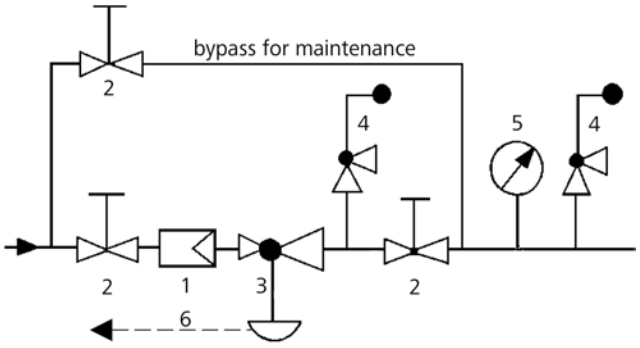
Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Pressure Reducer
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators

Valves for Simple Regulation Tasks			UV 1.2
single-seat straight-way valve with balanced cone for temperatures up to 300 °C | usable for liquids and gases | body made of GS-C 25 or CrNiMo-steel | diaphragm-, piston- or bellowscontrolled | suitable for higher pressures			
DN	25 - 200	PN	16 - 40
p_1	2 - 40 bar	K_{vs}	6 - 125 m³/h
T	300 °C		

Epoxy-coated Cast Valve for Pressure Relief Tasks			UV 1.3
simple seat-controlled valve for pressure limitation | for protection of pipelines and valves when pressure peaks occur | body made of GGG-50 with KTW-compliant epoxy coating | free discharge on the flow-off side | closed spring cap | suitable for potable waters			
DN	50 - 200	PN	25
p_1	0 - 25 bar in 3 setting ranges	K_{vs}	25 - 250 m³/h
T	70 °C		

Weight Loaded Backpressure Regulators			UV 1.6, 2.6
balanced straight-way valve for medium up to very large flow rates | usable for liquids, gases and steam | body made of GGG-40 or GS-C 25 | high precision thanks to integral control behaviour | response time can be adjusted by damping			
DN	50 - 400	PN	16 - 40
p_1	0,5 - 10 bar	K_{vs}	32 - 1200 m³/h
T	280 °C		

Valves for Medium and Large Flow Rates			UV 1.8
seat-controlled, single-seat angle valve with balanced cone for temperatures up to 300 °C | usable for liquids and gases, also suitable for viscous media | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | virtually pocket-free, corrosion-resistant, lightweight and compact | diaphragm-, piston- or bellows-relieved | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	25 - 100	G	25 - 50
PN	16	p_1	2 - 16 bar
K_{vs}	6 - 50 m³/h	T	300 °C

Pump Protection Valve			UV 1.9
seat-controlled, single-seat angle valve with balanced cone for medium flow rates | usable for all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosionresistant, frost-proof, free-draining | long operational lifespan, manageable installation, easy-to-maintain owing to the clamp system – highest effectiveness with compact design			
DN	50	G	2
PN	16	p_1	2 - 16
K_{vs}	12 m³/h	T	130 °C

Pressure Control Valves

Backpressure Regulators

Millibar Control Valve			UV 3.0
single-seat straight-way valve for medium flow rates | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosion-resistant, very lightweight and compact | very precise owing to large control surfaces and a large number of different control ranges, available in many different versions			
DN	15 - 50	G	1/2 - 2
PN	1	p_1	0.002 - 0.52 bar
K_{vs}	0.2 - 3.6 m^3/h	T	130 °C

Valve for small and medium Flow Rates			UV 3.2
single-seat straight-way valve for temperatures up to 300 °C | usable for liquids and gases | body made of GS-C 25 or CrNiMo-steel | diaphragm-, piston- or bellows-controlled			
DN	15 - 50	PN	16 - 40
p_1	2 - 40 bar	K_{vs}	0.2 - 5.5 m^3/h
T	300		

Compact Valve for Small Flow Rates			UV 3.5, 3.5S, 3.5Z
single-seat straight-way valve, also controls millibar ranges | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | adjusting screw as a functon of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, various designs and connection types | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 25	G	1/2
PN	25	p_1	0.005 - 20 bar
K_{vs}	0.2 - 0.90 m^3/h	T	200 °C

Valve for Viscous Media			UV 3.8K
single-seat angle valve for medium flow rates | usable for liquids and gases | completely made of deepdrawn CrNiMo-steel (316L) – surface finish of the body Ra			
DN	15 - 100	G	1/2 - 2
PN	10 - 16	p_1	2 - 16 bar
K_{vs}	3.5 - 9 m^3/h	T	180 °C

Valve for Hygiene Applications / Ultrapure Media			UV 3.8M
single-seat, angled design, straight-way valve for medium flow rates | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish possible up to Ra ≤ 0.25 µm | virtually pocket-free, corrosion-resistant, lightweight and compact | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | elastomers as per FDA and USP Class VI, hygienic class HE5 | reduced preheating time for CIP/SIP procedures, less energy needed | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 50	G	1/2 - 2
PN	10 - 16	p_1	2 - 16
K_{vs}	3.5 - 9 m^3/h	T	180 °C

Pressure Control Valves

Backpressure Regulators

Millibar Control Valve			UV 3.9
single-seat valve in the straightway, angle-type or U-shaped version for very small inlet pressures | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface fi nish of the body Ra ≤ 1.6 µm | highest regulating accuracy, lowest control ranges, good surface characteristics, various Kvs-values and versions possible			
DN	15 - 50	G	1/2 - 2
PN	1 - 2,5	p_1	0.01 - 1.1 bar
K_{vs}	0.2 - 28 m^3/h	T	130 °C

Standard Cast Valve			UV 4.1
single-seat straight-way valve with balanced cone for high flow rates | usable for liquids, gases and steam | body made of GS-C 25 or CrNiMo-steel | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 150	PN	16 - 40
p_1	0.02 - 10 bar	K_{vs}	4 - 160 m^3/h
T	200 °C		

Epoxy-coated Cast Valve for medium Flow Rates			UV 4.4
piston-controlled, single-seat straight-way valve with balanced cone for medium flow rates | usable for water, especially suitable for potable water | body made of GGG-50 with KTW-compliant epoxy coating | closed spring cap			
DN	50 - 150	PN	16, 25, 40
p_1	max. 12 bar	K_{vs}	17 - 155 m^3/h
T	70 °C		

Valves for Aggressive Media and Large Flow Rates			UV 4.7, 4.8
single-seat straight-way valve with balanced cone | UV 4.7 with open spring cap, UV 4.8 with closed spring cap | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, lightweight compared to its size, compact design | suitable for challenging environmental conditions and aggressive media			
DN	50 - 100	PN	16
p_1	0.02 - 10 bar	K_{vs}	32 - 100 m^3/h
T	130 °C		

Universal Valve			UV 5.1
single-seat straight-way valve with balanced cone for high flow rates | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosionresistant, very lightweight and compact | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | highest regulating accuracy thanks to a multitude of control ranges | various variants of convincing quality for your individual application | various connections and special versions available | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal			
DN	15 - 50	G	1/2 - 2
PN	16	p_1	0.02 - 12 bar
K_{vs}	3,5 - 22 m^3/h	T	130 °C

Pressure Control Valves

Backpressure Regulators

Diaphragm Controlled for „Low Flow“			UV 6906
single-seat straight-way valve for low flow rates | suitable for liquids and gases | body and spring cap made of 316 stainless steel - surface quality ≤ 0,8 µm | corrosion-resistant and compact | diaphragm made of Inconel X750 for maximum durability | a wide varity of designs and connection configurations			
G / NPT	1/4	p_1	0 - 20 bar
P_{max}	up to 50 bar	K_{vs}	0.09 m^3/h
C_{vs}	0.1 US gal/min.		

Piston Controlled for „Low Flow			UV 6907
single-seat straight-way valve for low flow rates | suitable for liquids and gases | body and spring cap made of 316 stainless steel - surface quality ≤ 0,8 µm | corrosion-resistant and compact | a wide varity of designs and connection configurations			
G / NPT	1/4	p_1	0 - 150 bar
P_{max}	up to 225 bar	K_{vs}	0.09 or 0.43 m^3/h
C_{vs}	0.1 or 0.5 US gal/min.		

Valve for High Pressures for Medium Flow Rates			UV 8.2
single-seat straight-way or angle valve for small and medium flow rates | highest pressures, high temperatures | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special material such as Duplex, Superduplex, Hastelloy® or titanium | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hard-faced valve cone and seat available for high pressure drops			
DN	15 - 50	G	3/8 - 2
PN	100	p_1	2 - 100 bar
K_{vs}	0.2 - 5.5 m^3/h	T	400 °C

Know How Backpressure Regulators

Backpressure regulators control an adjustable constant pressure upstream of the valve. A spring keeps the valve close. As the inlet pressure rises the valve opens.

Selecting valve type and nominal diameter
Using your maximum operating data and the smallest differential pressure Δp, you should calculate the characteristic performance figure K_v (see leaflet Calculation of Pressure Regulators). Select a valve whose K_{vs} value is 30 % greater than the calculated K_v figure. Additional allowances must be made for high-viscosity liquids or liquids which vaporise when depressurised.
Backpressure regulators should not be overdimensioned. Their optimum working range is within 10 % to 70 % of their K_{vs} value.

Selecting rated pressure and valve material
The rated pressure must exceed the maximum system pressure, irrespective of safety allowances. Please note also the effect of the temperature (see DIN 2401).

Selecting the setting range
For good control accuracy you should select a setting range which places the required inlet pressure near its upper limit. If, for example, the controlled inlet pressure is to be 2.3 bar, you should select the 0.8 to 2.5 bar setting range, not 2 to 5 bar. If the available setting range is not wide enough you may go below the bottom limit of the setting range provided that the valve loading is kept low and a high control accuracy not required.

Selecting elastomer materials
You should select eleastomers according to the operating temperature and the requirements of the medium. High-pressure gases, for example, can diffuse into the elastomer and cause damage when being depressurised.

Flow velocity
Depending on pressure drop and permitted maximum noise level, we recommend the following flow velocities:

Liquids	1	-	5	m/s
Saturated steam	10	-	40	m/s
Superheated steam	15	-	60	m/s
Gases up to 2 bar	2	-	10	m/s
Gases above 2 bar	5	-	40	m/s

Sense line (control line)
You should install a sense line if the selected backpressure regulator is designed for sense line operation. The sense line should be connected at a distance of not less than 10 times nominal diameter upstream of the valve. No isolating valves should be installed in the sense line to avoid an excessive pressure differential between valve body and diaphragm.
To attenuate any oscillations occurring in the pipeline system, the sense line may be fitted with a restrictor which must never be fully closed during operation.
In the case of steam and liquids the sense line must be installed so as to fall towards the valve. Under special operating conditions, for example intermittent operation with dry steam, an compensation vessel must be installed. The sense line must be rigid as elastic hoses can induce oscillations.

Protecting your system
To protect your system you should install a safety valve upstream of the backpressure regulator to prevent the maximum permitted operating pressure (normally 1.5 x maximum set pressure) being exceeded. The safety valve operating pressure should be set approximately 40 % above the maximum set pressure of the backpressure regulator to avoid blow-off during slight pressure fluctuations. For example: if the setting range of the backpressure regulator is 2 - 5 bar the safety valve operating pressure must be 1.4 x 5 bar = 7 bar.

Protecting the backpressure regulator
To protect the backpressure regulator against damage from solid particles carried in the pipeline, a strainer or filter should be fitted and serviced at regular intervals.

Valve seat leakage
Backpressure regulators are control valves which are not required to provide a leak-proof seal (VDI/VDE Guideline 2174). Normally backpressure regulators leave the factory with perfectly leakproof valve seats. During operation, however, solid particles often cause damage and seat leakage. Any low leakage requirement must be expressly specified when ordering. Valve leakage can be considerably reduced by special measures such as lapping the valve seat, using special cone seals and increasing the control (diaphragm) surfaces.

Cut-off
For the purpose of installation, servicing and isolation of the valve, shut-off valves should be installed upstream and downstream of the backpressure regulator. When closing the shut-off valves the upstream valve must always be closed first. A bypass line may be necessary to maintain emergency operation.

Stellited seat and cone
In the case of abrasive media or liquids with pressure drops (inlet pressure minus outlet pressure) of more than 25 bar the valve cone must be stellited; for pressure drops above 150 bar the seat must be stellited as well.

Leakage line
If toxic or hazardous media are used the valve must feature a sealed spring cap (including setting spindle seal) fitted with a leakage line connection. When the backpressure regulator is installed on site a leakage line must be fitted capable of safely and pressureless draining the escaping medium in case the control valve should become defective.

Mounting position
For gases a backpressure regulator can normally be fitted in horizontal pipelines with the spring cap at the bottom or at the top. Installation in vertical pipe runs is possible but can result in increased wear and loss of control accuracy owing to increased friction. In the case of liquids a backpressure regulator should be installed with the spring cover at the bottom. Thus gas traps upstream of the valve are avoided which would cause the valve to oscillate. For steam a backpressure regulator should likewise be installed with its spring cover at the bottom to protect the diaphragm against overheating by means of a layer of condensate.

Start-up
backpressure regulators should be started up and operated without pressure surges, if possible. A sudden operation of upstream or downstream valves should be avoided.

Steam operation
If a backpressure regulator is installed in a steam plant the diaphragm water reservoir must be filled before the plant is started up. There must be no danger of overheating at the installation site caused by excessive ambient temperatures or insufficient heat dissipation. backpressure regulators must not be insolated. In some cases an insulating of the body is permitted, but only with cast bodies. Never insulate diaphragm housing, mid section and spring cap (or open springs). Overheating caused by insulating destroys the elastomere of the control unit.

Setting the pressure
Backpressure regulators are normally supplied by us with a relaxed spring. This means that a valve is set at the factory to the minimum inlet pressure. The required pressure should be set under operating conditions.

Maintenance
Backpressure regulators must be cleaned and serviced regularly.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, operating instruction etc. MUST be followed.

Selection Backpressure Regulators

for steam

inlet pressure bar	T °C	K_{vs}-value m^3/h	connection G	connection DN	*	SS	notes	type
0.005 - 12	200	0.2 - 0.90	1/2	15 - 25	*	•	small flow rates, sterile application	3.5Z
0.02 - 10	200	4 - 160		15 - 150			most economic steam valve	4.1
0,1 - 10	300	4 - 338		15 - 150			sandwich design, large flow rates at low pressure drops	6.7 / 6.8

for liquids

inlet pressure bar	T °C	K_{vs}-value m^3/h	connection G	connection DN	*	SS	notes	type
0 - 25	70	25 - 150		50 - 200			pressure relieve valve epoxy coated for water	1.3
0,005 - 20	130	0.2 - 0.9	1/2	15 - 25			eneral purpose valve for small flow rates	3.5
0.01 - 1.1	130	0.2 - 28	1/2 - 2	15 - 50	*	•	low pressure regulator	3.9
0.02 - 10	130	32 - 100		50 - 100	*	•	economical stainless steel valve	4.7 / 4.8
0.02 - 10	200	4 - 160		15 - 150			economical valve with cast body	4.1
0.02 - 12	130	3.5 - 22	1/2 - 2	15 - 50	*	•	our most popular valve, can be used anywhere	5.1
0.1- 10	300	4 - 338		15 - 150			sandwich design, high flow rartes at low pressure drops	6.7 / 6.8
0.5 - 10	280	32 - 1200		50 - 400			large flow rates, weight loaded, high acuracy	1.6 / 2.6
0.8 - 10	130	3.9 - 9	1/2 - 2	15 - 100	*	•	CIP, SIP, elbow design, electropolished available	3.8M
1.5 - 12	70	17 - 155		50 - 150			for drinking water epoxy coated, piston controlled	4.4
1.5 - 15	70	40 - 1400		50 - 400			for drinking water epoxy coated, pilot controlled	116
2 - 16	150	3.5 - 9	1/2 - 2	15 - 100			angle valve for viscous media	3.8K
2 - 20	130	60 - 2100		100-800	*		large flow rate, inline-valve, pilot controlled	824 / 825
2 - 40	300	0.2 - 5.5		15 - 50			economical valve with cast body, small flow rates, with bellow	3.2
2 - 40	300	6 - 125		25 - 200			for simple control applications	1.2
2 - 40	130	20 - 70		40 - 150			large flow rates, inline-valve, pilot controlled	820Eck
2 - 40	130	20 - 900		40 - 400			large flow rates, inline-valve, pilot controlled	820
2 - 100	400	0.2 - 5.5	3/8 - 2	15 - 50	*		high pressure valve	8.2

for gases

inlet pressure bar	T °C	K_{vs}-value m^3/h	connection G	connection DN	*	SS	notes	type
0,005 - 20	130	0.2 - 0.9	1/2	15 - 25			eneral purpose valve for small flow rates	3.5
0.01 - 1.1	130	0.2 - 28	1/2 - 2	15 - 50	*	•	low pressure regulator	3.9
0.02 - 10	130	32 - 100		50 - 100	*	•	economical stainless steel valve	4.7 / 4.8
0.02 - 10	200	4 - 160		15 - 150			economical valve with cast body	4.1
0.02 - 12	130	3.5 - 22	1/2 - 2	15 - 50	*	•	our most popular valve, can be used anywhere	5.1
0.1 - 10	300	1.7 - 338		15 - 150			sandwich design, high flow rates at low pressure drops	6.7 / 6.8
0.5 - 10	280	32 - 1200		50 - 400			large flow rates, weight loaded, high acuracy	1.6 / 2.6
1,5 - 12	70	17 - 155		50 - 150			piston controlled, epoxy coated, for harmless gases	4.4
2 - 16	150	3.5 - 9	1/2 - 2	15 - 100			angle valve for viscous media	3.8K
2 - 20	130	60 - 2100		100-800			large flow rates, inline-valve, pilot controlled	824 / 825
2 - 40	300	0.2 - 5.5		15 - 50			economical valve with cast body, small flow rates	3.2
2 - 40	300	6 - 125		25 - 200			for simple control applications	1.2
2 - 40	130	20 - 70		40 - 150			angle valve, large flow rates, pilot controlled	820Eck
2 - 40	130	20 - 900		40 - 400			large flow rates, pilot controlled	820
2 - 100	400	0.2 - 5.5	3/8 - 2	15 - 50	*		high pressure valve	8.2

* other connections available, • stainless steel depp drawn

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pressure Control Valves

Backpressure Regulators UV 1.2

Valves for Simple Regulation Tasks

Technical Data

Connection DN	25 - 200
Nominal Pressure PN	16 - 40
Inlet Pressure	2 - 40 bar
K_{vs}-Value	6 - 125 m^3/h
Temperature	300 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 1.2 backpressure regulator is a spring-loaded, seat-controlled proportional control valve featuring diaphragm, piston or bellows relief. It is designed for simple control tasks and medium volumes. The valve cone can be fitted with a metallic or soft seal.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Options

- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

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K_{vs}-Values [m^3/h]					
seat	nominal diameter DN				
	25	32	40	50	65
I	6	12	15	20	35
II	-	6	12	15	20
III	-	-	6	12	15

K_{vs}-Values [m^3/h]					
seat	nominal diameter DN				
	80	100	125	150	200
I	40	50	80	95	125
II	35	40	50	80	95
III	20	35	40	50	80

Pressure Control Valves

Backpressure Regulators UV 1.2

Valves for Simple Regulation Tasks

Materials			
Temperature	80 °C	130 °C	300 °C
Body	cast steel optional CrNiMo-steel		
Spring Cap	steel welded optional CrNiMo-steel		
Spring	spring steel optional CrNiMo-steel		
Metallic Seal	CrNi-steel optional CrNiMo-steel		
Soft Seal	NBR	EPDM optional FPM	-
Diaphragm	CR	EPDM optional FPM	-
O-Ring	NBR	EPDM optional FPM or FXM	-
Bellow	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel

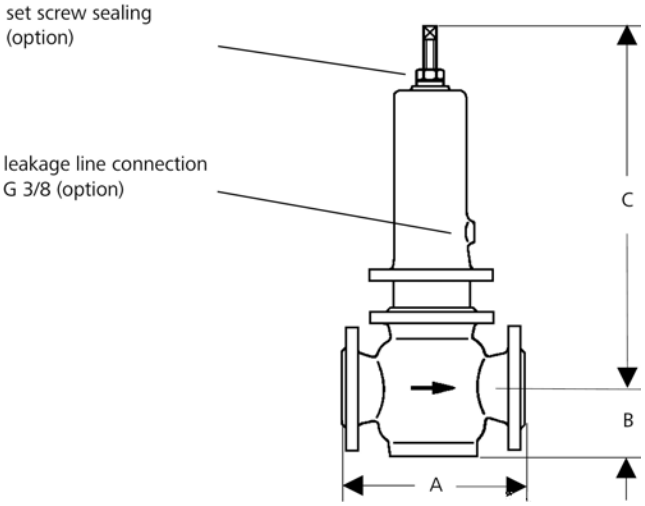
Dimensions [mm]						
size	nominal pressure	nominal diameter DN				
		25	32	40	50	65
A	PN 16 - 40	160	180	200	230	290
B	PN 16 - 40	-	72	72	72	102
C	PN 16 - 40	on request				

Dimensions [mm]						
size	nominal pressure	nominal diameter DN				
		80	100	125	150	200
A	PN 16 - 40	310	350	400	480	600
B	PN 16 - 40	102	102	240	240	270
C	PN 16 - 40	on request				

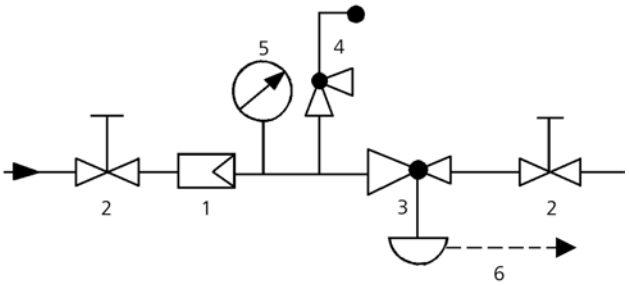
Weights [kg]										
nominal pressure	nominal diameter DN									
	25	32	40	50	65	80	100	125	150	200
PN 16	12	17	20	22	32	40	60	100	120	220
PN 40	14	20	24	28	42	50	70	115	140	250

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 backpressure regulator
4 Safety Valve
use MANKENBERG-Products
5 Pressure Gauge
6 Leakage Line G 3/8 (option)

Pressure Control Valves

Backpressure Regulators UV 1.3

Epoxy-coated Cast Valve for Pressure Relief Tasks

Technical Data

Connection DN	50 - 200
Nominal Pressure PN	25
Inlet Pressure	0 - 25 bar in 3 setting ranges
K_{vs}-Value	25 - 250 m³/h
Temperature	70 °C
Medium	water

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 1.3 is a seat-controlled, spring-loaded backpressure regulator for the protection of pump systems or other pressurised vessels or pipes with high throughputs. The opening pressure is continuously adjustable from the outside. The valve works reliably for tasks to minimise pressure surge (pressure surge limitation).

One special characteristic is its very compact design. The valve cone is soft-sealed (special flat seal). The valve is made of spheroidal graphite iron with a continuous epoxy coating > 200 µm, providing excellent protection against corrosion.

Thanks to its bell shape the controller automatically empties, ensuring that the medium cannot freeze (frost protection without subsequent emptying).

Standard

» body made of spheroidal graphite iron with an epoxy coating
» seat control
» bell shape, self-emptying

Options

» factory pre-set
» secured against unauthorised outside adjustment
» nominal pressure PN 40

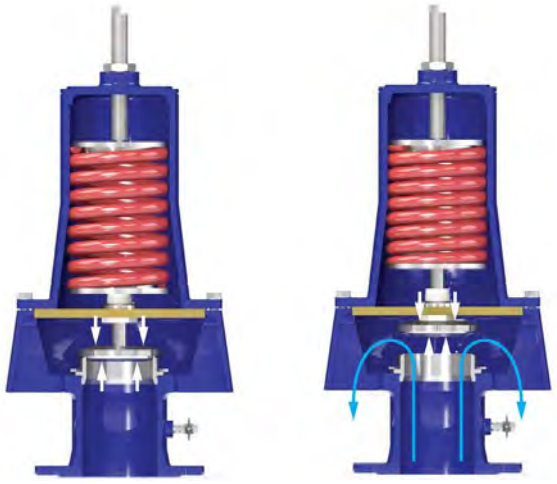
Capabilities

» as a pump protection valve
» as a surge limiting device

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Setting Ranges [bar]		
0 - 8	8 - 16	16 - 25

K_{vs}-Values [m³/h]						
nominal diameter DN	50	65	80	100	150	200
seat ø mm	40	40	62	62	137	137
Kvs-value m³/h	25	25	70	70	250	250



closed open

Pressure Control Valves

Backpressure Regulators UV 1.3

Epoxy-coated Cast Valve for Pressure Relief Tasks

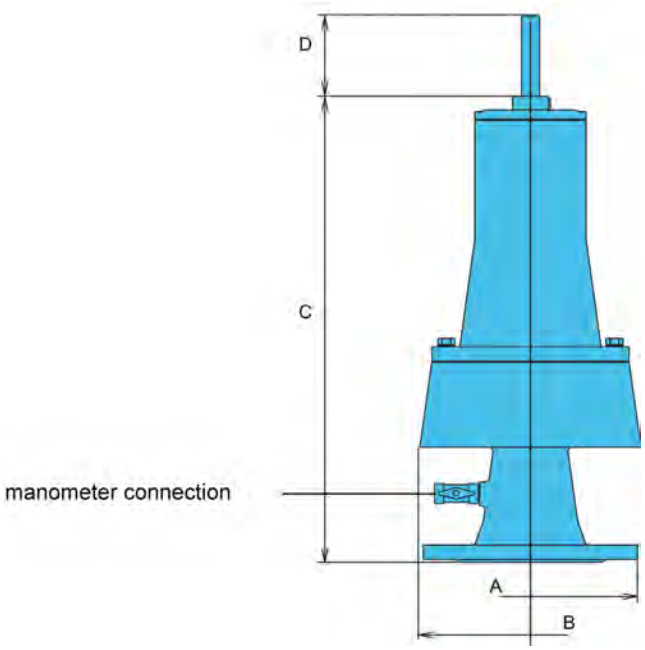
Materials	
Body	spheroidal cast iron epoxy coated
Spring Cap	spheroidal cast iron epoxy coated
Spring	stainless steel 55SiCr6
Valve Seal	EU
Elastomers	Polyurethan

Dimensions[mm]				
size	nominal diameter DN			
	50/65	80/100	150	200
A	185	235	300	360
B	185	242	404	404
C	417	540	720	720
D	40	50	220	220

Weights [kg]			
nominal diameter DN			
50/65	80/100	150	200
14	28	75	79

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pressure Control Valves

Backpressure Regulators UV 1.6, 2.6

Weight Loaded Backpressure Regulators

Technical Data

Connection DN	50 - 400
Nominal Pressure PN	16 - 40
Inlet Pressure	0,5 - 10 bar
K_{vs}-Value	32 - 1200 m^3/h
Temperature	280 °C
Medium	liquids, gases and steam

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 1.6 and UV 2.6 backpressure regulators are medium-controlled weighted-lever valves for medium to large volumes. These valves require no auxiliary energy. Thanks to their integral control characteristics they are very accurate. The time reponse is set by means of an oil-filled damper.
UV 1.6 is a single seat, UV 2.6 a twin seat valve; both are piston-controlled. The valves can be supplied with soft or hard seals.

When the pipeline is depressurised the valve cone is kept in closed position by the weighted lever. As the inlet pressure rises a control piston is pressurised via a pilot line, lifting the lever and moving the valve cone towards the „open" position. During normal operation the closing force of the weight and the opening force of the piston balance each other and the backpressure regulator operates continually. The inlet pressure is kept constant irrespective of outlet pressure and flow volume. The control pressure is set by changing the weight on the lever.

The maximum inlet pressure must not exceed 1.5 times the maximum set pressure, unless specified otherwise.

In the case of toxic or hazardous media a leakage line must be installed to the control unit capable of draining leaking medium safely and without pressure if the control element should become defective.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent (UV 1.6) respectively 0.5 percent (UV 2.6) of the constant volume flow is permitted for the valve in closed position.

The valves requires a sense line (to be installed on-site).

Options

» various seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values[m^3/h]

type	nominal diameter DN				
	50	65	80	100	125
1.6	32	50	75	100	140
2.6	40	65	100	150	180

K_{vs}-Values [m^3/h]

type	nominal diameter DN					
	150	200	250	300	350	400
1.6	200	300	450	550	650	800
2.6	250	400	550	700	750	1200

Pressure Control Valves

Backpressure Regulators UV 1.6, 2.6

Weight Loaded Backpressure Regulators

Materials		
Temperature	80 °C	
Nominal Pressure	PN 16	PN 40
Operating Pressure	max. 16 bar	max. 40 bar
Body	spherodial cast iron or cast steel	cast steel
Tubular Section	steel welded	
Internals	chromium steel / CrNiMo-steel	
Valve Seal	NBR / FPM / EPDM / PTFE cromium steel / CrNiMo-steel	
O-Ring	NBR / FPM / EPDM / PTFE	

Materials		
Temperature	280 °C	
Nominal Pressure	PN 16	PN 40
Operating Pressure	max. 13 bar	max. 28 bar
Body	spherodial cast iron	cast steel
Tubular Section	steel welded	
Internals	chromium steel / CrNiMo-steel	
Valve Seal	chromium steel / CrNiMo-steel	
O-Ring	FXM / FFKM	

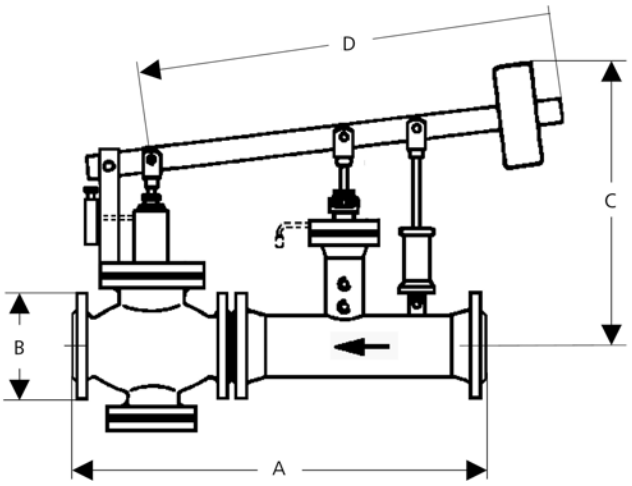
Dimensions [mm]						
Size	nominal diameter DN					
	50	65	80	100	125	150
A	580	630	670	750	850	980
B	120	200	200	200	260	260
C*	650	850	850	850	900	900
D*	750	1150	1150	1150	1500	1500

Dimensions [mm]					
Size	nominal diameter DN				
	200	250	300	350	400
A	1200	1430	1650	1800	2100
B	260	350	350	350	420
C*	900	1100	1100	1100	1100
D*	1500	2000	2000	2000	2000

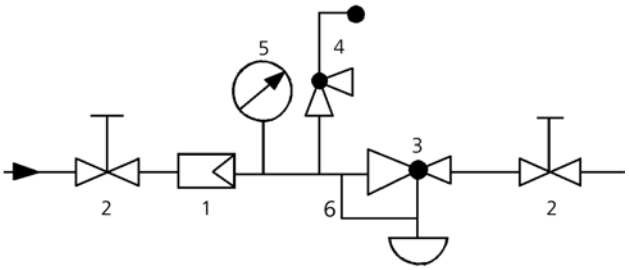
*Dimensions C and D are reference dimensions. The weighted lever (dim. D) may project beyond the valve inlet flange.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Backpressure Regulator
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2

sense line connection 5 x DN before the valve.
use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 1.8

Valves for Medium and Large Flow Rates

Technical Data

Connection DN	25 - 100
Connection G	25 - 50
Nominal Pressure PN	16
Inlet Pressure	2 - 16 bar
K_{vs}-Value	6 - 50 m^3/h
Temperature	300 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 1.8 backpressure regulator is a spring-loaded seat-controlled proportional control valve featuring diaphragm, piston or bellows control. It is designed for hygienic applications and medium volumes of high-viscosity media. The valve cone can be fitted with a metallic or soft seal.

This valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. It contains virtually no dead pockets and is suitable for use in CIP and SIP systems. The angled design allows complete draining.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Options

- polished version for food, pharmaceutical and superclean applications, surface roughness Ra ≤ 0,25 oder 0,4 oder 0,8 µm
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections:
  Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]

seat	nominal diameter DN						
	25	32	40	50	65	80	100
I	6	6	6	12	15	20	35
II	-	12	12	15	20	35	40
III	-	-	15	20	35	40	50

Pressure Control Valves

Backpressure Regulators UV 1.8

Valves for Medium and Large Flow Rates

Materials			
Temperature	80 °C	130 °C	300 °C
Body	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Spring Cap	steel welded optional CrNiMo-steel		
Spring	spring steel optional CrNiMo-steel		
Soft Seal	NBR	EPDM optional FPM	-
Metallic Seal	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Diaphragm	CR	EPDM optional FPM	-
O-Ring	NBR	EPDM optional FPM	-
Bellow	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel

Dimensions [mm]							
size	nominal diameter DN						
	25	32	40	50	65	80	100
A1	100	105	115	125	145	155	175
B	100	105	115	125	145	155	175
C	on request						
ø D							

Dimensions [mm]				
size	nominal diameter G			
	1	1 1/4	1 1/2	2
A	80	80	80	80
B	80	80	80	80
C	on request			
ø D				

Weights [kg]						
nominal diameter DN						
25	32	40	50	65	80	100
10.2	11.5	12	13.5	14	14.7	15.6

Weights [kg]			
nominal diameter G			
1	1 1/4	1 1/2	2
8.5	8.8	9	9.4

Special designs on request.
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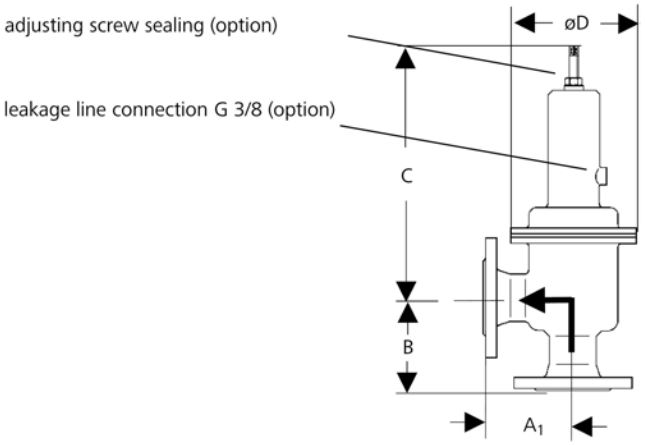
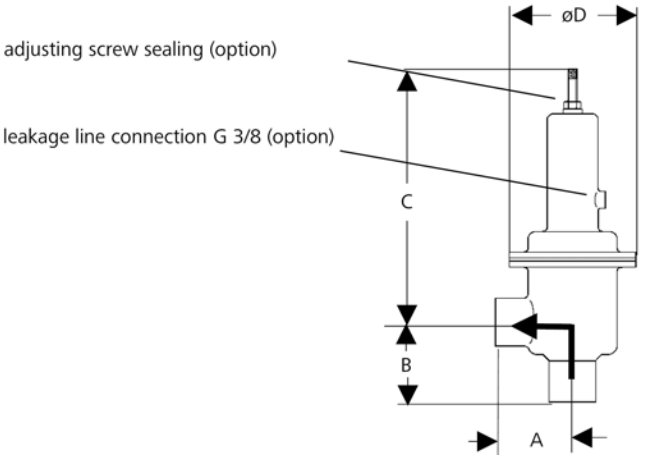
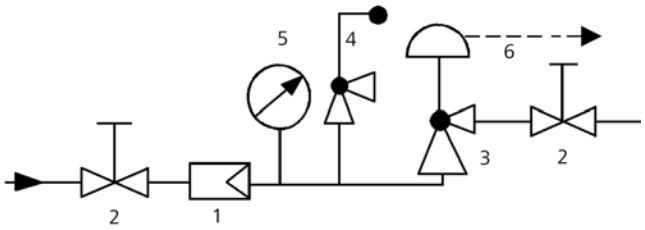
Dimensional Drawing





Recommended Installation



1 Strainer
2 Shutoff valves
3 backpressure regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 3/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 1.9

Pump Protection Valve

Technical Data

Connection DN	50
Connection G	2
Nominal Pressure PN	16
Inlet Pressure	2 - 16
K_{vs}-Value	12 m^3/h
Temperature	130 °C
Medium	liquids

Setting Ranges [bar], Nominal Pressure		
2 - 5	4 - 10	8 - 16
PN 10	PN 16	PN 16

Description

Medium-controlled backpressure regulators are simple control valves used to relieve pressurised systems of excessive pressure in a controlled way. These valves do not require pneumatic or electrical control components to work reliably. They are easy to install and maintain.

The UV1.9 backpressure regulator is a seat-controlled spring-loaded valve used to protect pump systems or other pressurised vessels or pipelines. The set pressure is continuously adjustable from the outside.

Its special feature is its very compact design. The valve cone has a hard seal (metallic seal). The valve is manufactured from deep-drawn CrNiMo stainless steel featuring excellent corrosion resistance.

Thanks to its angled form the valve drains automatically, ensuring that medium cannot freeze in the valve (Frost protection without special draining).

Pilot lines are not required.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» all stainless steel construction
» valve body manufactured from high performance deepdrawn materials
» seat-controlled
» angled design, no dead pockets, self-draining
» preset at the factory
» tamper-proof

Capabilities

» as pump protection valve
» as pressure surge limiter

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Control Valves

Backpressure Regulators UV 1.9

Pump Protection Valve

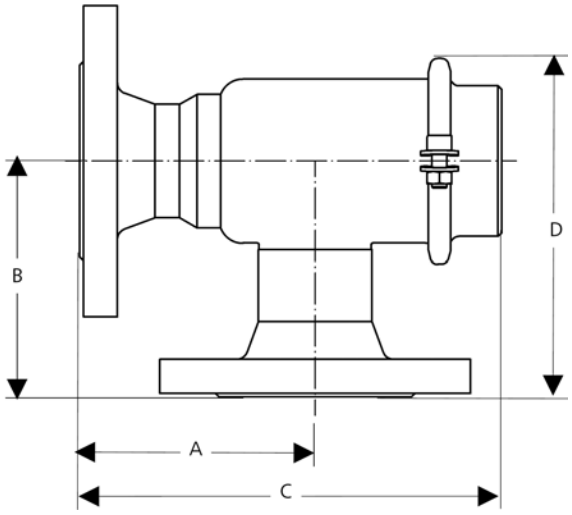
Materials	
Temperature	130 °C
Body	CrNiMo-steel
Spring	CrNiMo-steel
Main Valve Valve Seal	metallic
Elastomeres	EPDM optional PTFE or FPM

Dimensions [mm]		
size	nominal diameter DN	
	50	
A	125	
B	125	
C	224	
D	190	

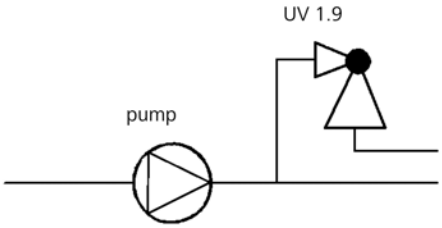
Weights [kg]
nominal diameter DN
50
10

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



Pressure Control Valves

Backpressure Regulators UV 3.0

Millibar Control Valve

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	1
Inlet Pressure	0.002 - 0.52 bar
K_{vs}-Value	0.2 - 3.6 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 3.0 backpressure regulator is a diaphragm-controlled spring-loaded proportional control valve for very small outlet pressures and large volumes.

This backpressure regulator is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- sense line connection

Options

- pressure gauge connection
- oil and grease-free version for oxygen
- clean gas version with special connections
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h] for all body sizes					
0.2	0.9	1.5	2.2	2.8	3.6

Setting Ranges [bar] diaphragm diameter 500 mm			
0.002 - 0.003	0.003 - 0.015	0.008 - 0.03	0.012 - 0.07

Setting Ranges [bar] diaphragm diameter 360 mm			
0.004 - 0.006	0.005 - 0.032	0.015 - 0.06	0.025 - 0.14

Setting Ranges [bar] diaphragm diameter 270 mm			
0.008 - 0.016	0.015 - 0.032	0.02 - 0.12	0.05 - 0.28

Setting Ranges [bar] diaphragm diameter 220 mm			
0.015 - 0.030	0.025 - 0.125	0.05 - 0.22	0.1 - 0.52

Pressure Control Valves

Backpressure Regulators UV 3.0

Millibar Control Valve

Materials		
Temperature	80 °C	130 °C
Body, Spring Cap, Internals, Screws	CrNiMo-steel	CrNiMo-steel
Set Screw	CrNiMo-steel M10 with handwheel made of Duroplast	
Spring	CrNi-steel	CrNi-steel
Valve Seal	FPM	FPM
Diaphragm	NBR	EPDM

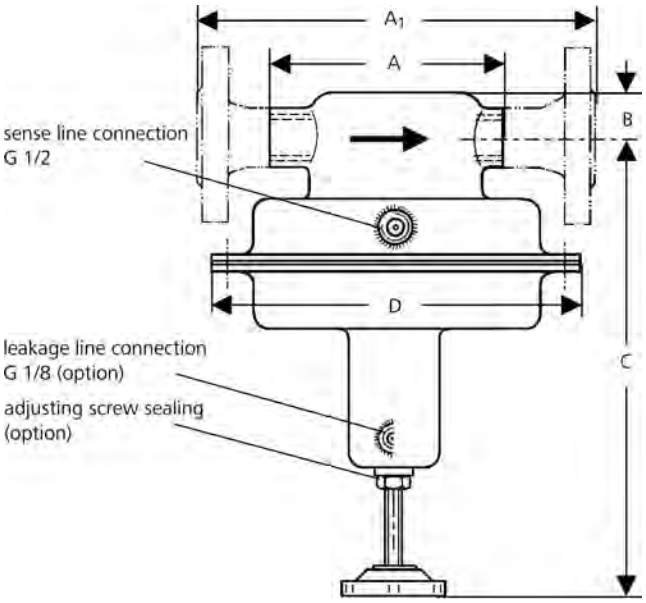
Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A	165	170	170	180	180	180
B	35	35	35	40	45	50
C	320	330	330	340	350	360
D	= diaphragm diameter see table setting ranges					

Dimensions [mm]						
size	nominal diameter DN					
	15	20	25	32	40	50
A1	240	240	250	250	260	260
B	35	35	35	40	45	50
C	320	330	330	340	350	360
D	= diaphragm diameter see table setting ranges					

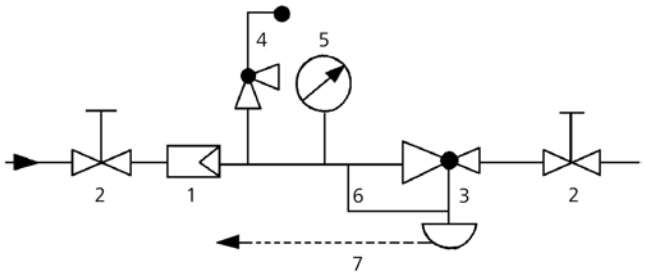
Weights [kg]			
diaphragm diameter	nominal diameter		
	G 1/2 - 2	DN 15 - 25	DN 32 - 50
500	13	15	17
360	12,5	14,5	16,5
270	8	10	12
220	6	8	10

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Backpressure Regulator
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN before the valve.
use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 3.2

Valve for small and medium Flow Rates

Technical Data

Connection DN	15 - 50
Nominal Pressure PN	16 - 40
Inlet Pressure	2 - 40 bar
K_{vs}-Value	0.2 - 5.5 m^3/h
Temperature	300
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 3.2 backpressure regulator is a spring-loaded proportional control valve featuring diaphragm, piston or bellows control. It is designed for small volumes. The valve cone can be fitted with a metallic or soft seal.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

Options

- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your mediumm
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]

seat	nominal diameter DN					
	15	20	25	32	40	50
I	0.2	0.25	0.25	0.4	0.4	1
II	0.9	0.9	0.9	2.5	2.5	3.5
III	1.8	2.2	2.2	3.9	3.9	5.5

Pressure Control Valves

Backpressure Regulators UV 3.2

Valve for small and medium Flow Rates

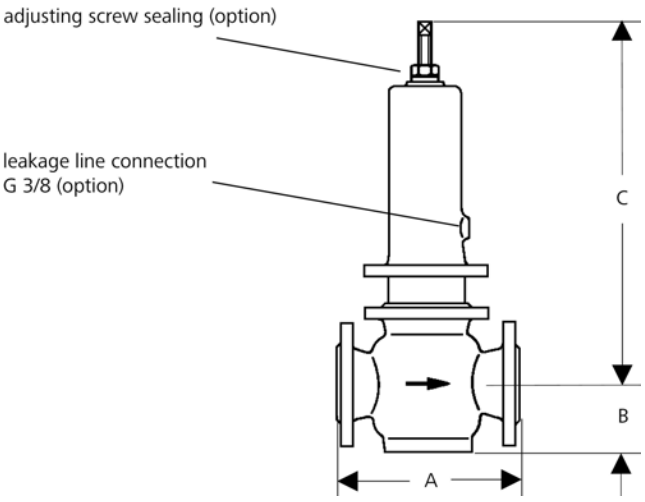
Materials			
Temperature	80 °C	130 °C	300 °C
Body	cast steel optional CrNiMo-steel		
Spring Cap	steel welded optional CrNiMo-steel		
Spring	spring steel optional CrNiMo-steel		
Metallic seal	CrMo-steel optional CrNiMo-steel		
Soft Seal	NBR	EPDM optional FPM	-
Diaphragm	CR	EPDM optional FPM	-
O-Ring	NBR	EPDM optional FPM or FXM	-
Bellow	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel

Dimensions [mm]						
size	nominal pressure	nominal diameter DN				
		15	25	32	40	50
A	PN 16 - 40	130	160	180	200	230
B	PN 16 - 40	-	-	72	72	72
C	PN 16 - 40	on request				

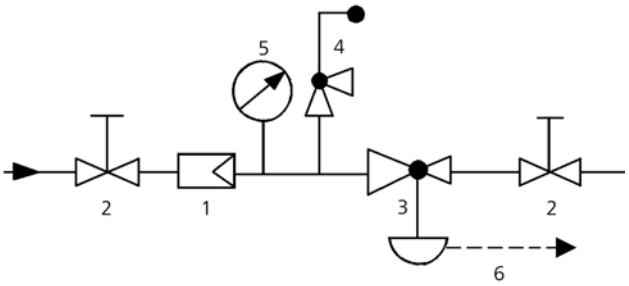
Weights [kg]						
nominal pressure	nominal diameter DN					
	15	20	25	32	40	50
PN 16	10	13	15	17	20	23
PN 25/40	13	15	17	20	23	26

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 3/8 (option)
(option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 3.5, 3.5S, 3.5Z

Compact Valve for Small Flow Rates

Technical Data

Connection DN	15 - 25
Connection G	1/2
Nominal Pressure PN	25
Inlet Pressure	0.005 - 20 bar
K_{vs}-Value	0.2 - 0.90 m^3/h
Temperature	200 °C
Medium	liquids, gases and steam

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 3.5, UV 3.5S and UV 3.5Z backpressure regulators are spring-loaded diaphragm-controlled proportional control valves for small volumes. They are manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone can be fitted with a metallic or soft seal.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

The UV 3.5S and UV 3.5Z overflow valves require a pilot line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- all stainless steel construction
- non rising adjusting screw
- quick-release body clamp ring
- sense line connection (UV 3.5S and UV 3.5Z)

Options

- pneumatic actuation
- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various diaphragm and seal materials suitable for your medium
- special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]		
seat I	seat II	seat III
0.2	0.5	0.9

Setting Ranges [bar] UV 3.5 + UV 3.5S	
setting range bar	nominal pressure
0.005 - 0.025	PN 1
0.02 - 0.12	
0.1 - 0.5	
0.2 - 1.1	PN 2.5
0.8 - 2.5	PN 6
1 - 5	PN 10
4 - 12	PN 25
10 - 20	

Setting Ranges [bar] UV 3.5Z	
setting range bar	nominal pressure
0.005 - 0.025	PN 1
0.02 - 0.12	
0.1 - 0.5	
0.2 - 1.1	PN 2.5
0.8 - 2.5	PN 6
1 - 5	PN 10
4 - 12	PN 16

Pressure Control Valves

Backpressure Regulators UV 3.5, 3.5S, 3.5Z

Compact Valve for Small Flow Rates

Materials			
Type	UV 3.5		UV 3.5Z
Temperature	80 °C	130 °C	200 °C
Body	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Spring Cap			
Internals			
Spring	CrNi-steel	CrNi-steel	CrNi-steel
Valve Seal	UV 3.5: CrNiMo-steel UV 3.5S: EU	UV 3.5: CrNiMo-steel UV 3.5S: FPM or EPDM or PTFE	SST 316L
Diaphragm	CR	FPM or EPDM	EPDM
Prtection Foil for Diaphragm	PTFE (option)	PTFE (option)	PTFE (option)

Dimensions [mm]

setting range bar	size	type	nominal diameter			
			G 1/2	DN 15	DN 20	DN 25
all ranges	B	3.5 + 3.5Z	39	39	39	39
0.005 - 0.025 0.02 - 0.12	A/A_1	3.5 + 3.5Z	100	130	150	160
	C	3.5	275	275	275	272
	C	3.5Z	405	405	405	415
	D	3.5 + 3.5Z	360	360	360	360
0.1 - 0.5	A/A_1	3.5 + 3.5Z	100	130	150	160
	C	3.5	275	275	275	272
	C	3.5Z	405	405	405	415
	D	3.5 + 3.5Z	264	264	264	264
0.2 - 1.1	A/A_1	3.5 + 3.5Z	100	130	150	160
	C	3.5	275	275	275	272
	C	3.5 + 3.5Z	405	405	405	405
	D	3.5 + 3.5Z	200	200	200	200
0.8 - 2.5	A/A_1	3.5	100	180	180	180
	A/A_1	3.5Z	100	130	150	160
	C	3.5	205	205	205	205
	C	3.5Z	338	338	338	338
	D	3.5 + 3.5Z	138	138	138	138
1 - 5 4 - 12 10 - 20	A/A_1	3.5 + 3.5Z	100	130	150	160
	C	3.5	205	205	205	205
	C	3.5Z	338	338	338	338
	D	3.5 + 3.5Z	114	114	114	114

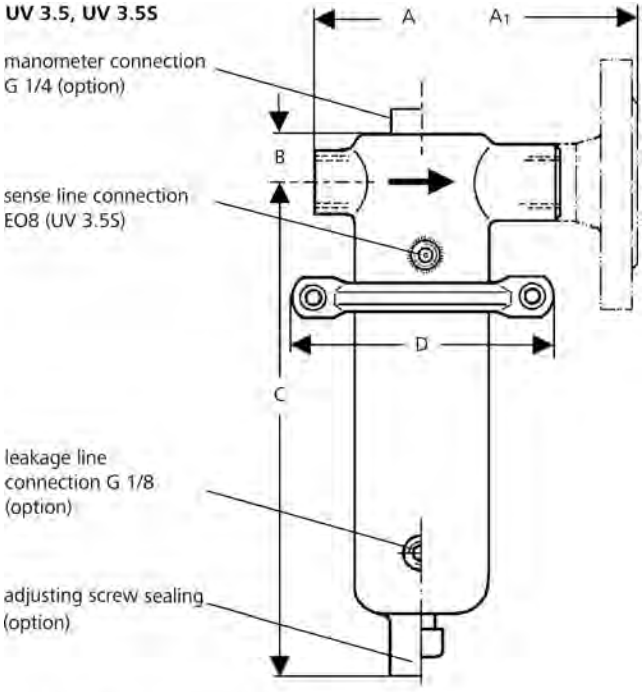
Weights [kg]

setting range bar	type	nominal diameter			
		G 1/2	DN 15	DN 20	DN 25
0.005 - 0.025 0.02 - 0.12	3.5	6	7.5	7.5	8
	3.5Z	6.5	8	8	8.5
0.1 - 0.5	3.5	5.5	7	7	7.5
	3.5Z	6	7.5	7.5	8
0.2 - 1.1	3.5	4.5	6	6	6.5
	3.5Z	5	6.5	6.5	7
0.8 - 2.5	3.5	2	3.5	3.5	4
	3.5Z	2.5	4	4	4.5
1 - 20	3.5	1.5	3	3	3.5
	3.5Z	2	3.5	3.5	4

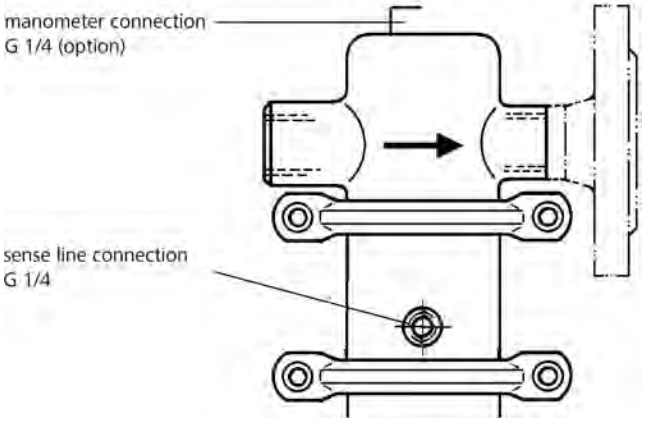
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

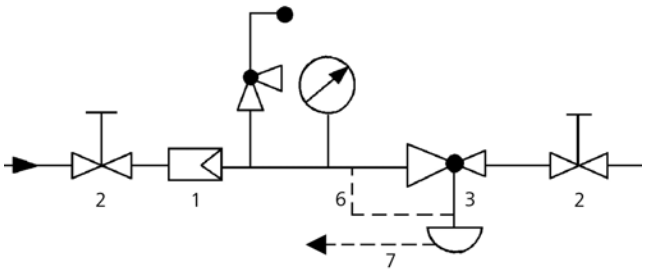
UV 3.5, UV 3.5S



UV 3.5Z (dimensions see UV 3.5)



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Backpressure Regulator
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8, G 1/4 (option)
7 Leakage Line G 1/8 (option)

sense line connection 10 - 20 x DN before the valve
use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 3.8K

Valve for Viscous Media

Technical Data

Connection DN	15 - 100
Connection G	1/2 - 2
Nominal Pressure PN	10 - 16
Inlet Pressure	2 - 16 bar
K_{vs}-Value	3.5 - 9 m^3/h
Temperature	180 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The backpressure regulator UV 3.8K is a piston-controlled , spring-loaded proportional valve for viscous media at medium flow rates. The valve cone is provided with a metallic seal.

This valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. It contains virtually no dead pockets. The angled design allows complete draining.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

- medium wetted parts made of CrNiMo-Stahl
- piston controlled

Options

- for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
- various O-ring and seal materials suitable for your medium
- special connections: ANSI or JIS flanges, NPT, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} Values[m^3/h]										
nominal diameter	DN	15	20	25	32	40	50	65	80	100
	G	1/2	3/4	1	1 1/4	1 1/2	2	-	-	-
K_{vs} value	m^3/h	3.5	3.5	3.5	3.5	5.5	5.5	9	9	9

Pressure Ranges [bar], Nominal Pressure		
2 - 5	4 - 10	8 - 16
PN 10	PN 16	PN 16

Pressure Control Valves

Backpressure Regulators UV 3.8K

Valve for Viscous Media

Materials			
Temperature	80 °C	130 °C	150 °C
Body	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Spring Cap	steel welded optional CrNiMo-steel		
Spring	spring steel C optional CrNiMo-steel		
O-Ring	NBR	EPDM optional FPM	FPM-PTFE coated

Dimensions [mm]									
size	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
A	90	95	100	105	115	125	145	155	190
B	90	95	100	105	115	125	145	155	175
C	500	500	500	500	500	500	500	600	800
ø D	200	200	200	200	200	200	200	200	240

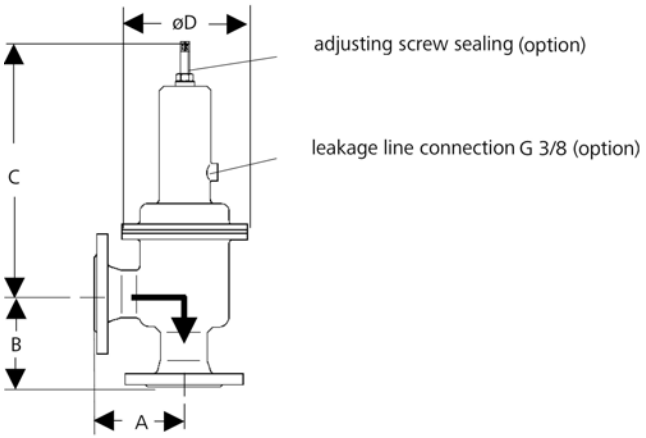
Weights [kg]								
nominal diameter DN								
15	20	25	32	40	50	65	80	100
10,8	11,3	11,8	13,0	13,5	15,0	16,7	18,7	22,0

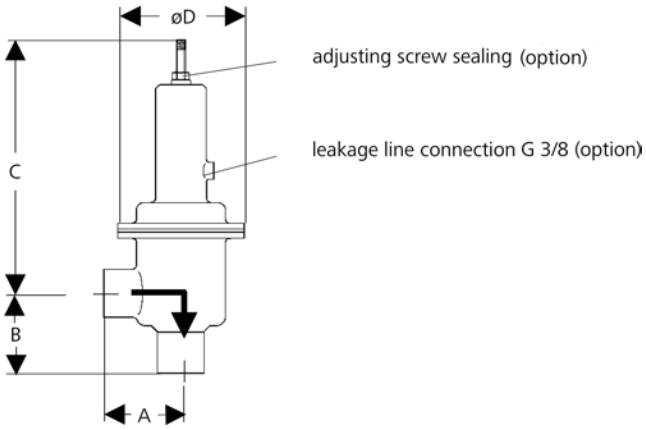
Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A	80	80	80	80	80	80
B	80	80	80	85	115	125
C	500	500	500	500	500	600
ø D	200	200	200	200	200	200

Weights [kg]					
nominal diameter G					
1/2	3/4	1	1 1/4	1 1/2	2
8	8,2	8,5	8,8	9	9,4

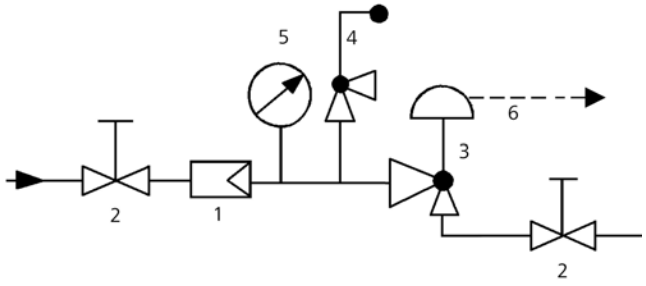
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
use MANKENBERG-Products
5 Pressure Gauge
6 Leakage Line G 3/8 (option)

Pressure Control Valves

Backpressure Regulators UV 3.8M

Valve for Hygiene Applications / Ultrapure Media

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	10 - 16
Inlet Pressure	2 - 16
K_{vs}-Value	3.5 - 9 m^3/h
Surface Roughness	≤ 3.2 µm
Temperature	180 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 3.8 backpressure regulator is a spring-loaded piston-controlled proportional control valve designed for hygienic applications and medium volumes. The valve cone is fitted with a hard seal.

This valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. It contains virtually no dead pockets and is suitable for use in CIP and SIP systems. The angled design allows complete draining.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» all stainless steel construction
» piston control

Options

» polished version for food, pharmaceutical and superclean applications, surface roughness Ra ≤ 0.25 or 0.4 or 0.8 µm
» for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special connections:
Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} Vakues [m^3/h]										
nominal diameter	DN	15	20	25	32	40	50	65	80	100
	G	1/2	3/4	1	1 1/4	1 1/2	2	-	-	-
K_{vs} value	m^3/h	3.5	3.5	3.5	3.5	5.5	5.5	9	9	9

Setting Ranges [bar], Nominal Pressure		
0.8 - 2.5	2 - 5	4 - 10
PN 6	PN 10	PN 16

Pressure Control Valves

Backpressure Regulators UV 3.8M

Valve for Hygiene Applications / Ultrapure Media

Materials	
Temperature	130 °C
Body	CrNiMo-steel
Spring Cap	steel welded optional CrNiMo-steel
Spring	spring steel C optional CrNiMo-steel
Diaphragm	EPDM optional FPM
Protection Foil for Diaphragm (option)	PTFE

Dimensions [mm]

size	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
A	90	95	100	105	115	125	145	155	175
B	90	95	100	105	115	125	145	155	175
C	200	200	200	500	500	500	600	640	700
ø D	138	138	138	200	200	200	200	200	240

Weights [kg]

nominal diameter DN								
15	20	25	32	40	50	65	80	100
3.9	4.5	4.8	6.1	6.7	8.1	9.9	11.9	15.1

Dimensions [mm]

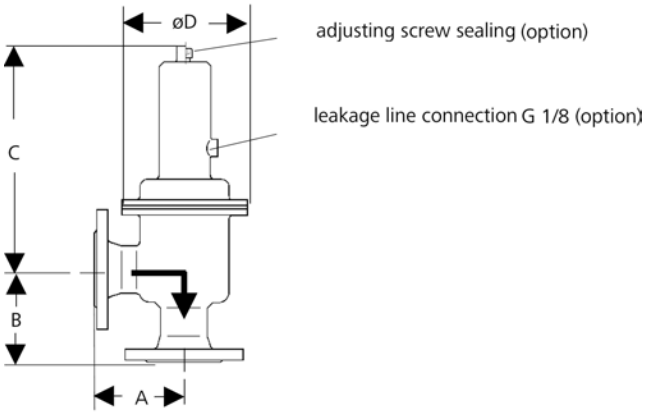
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A	80	80	80	80	80	80
B	80	80	80	80	80	80
C	200	200	200	200	200	200
ø D	138	138	138	200	200	200

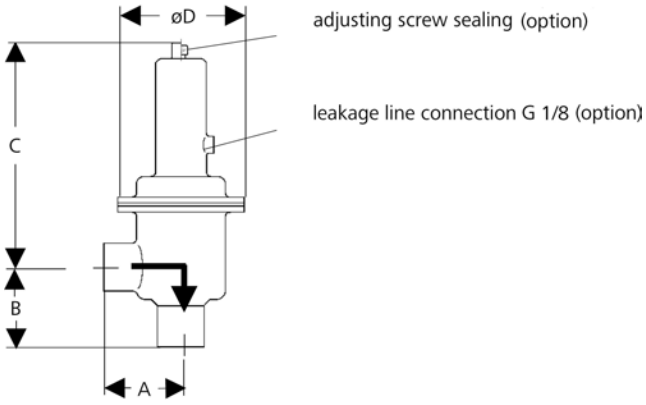
Weights [kg]

nominal diameter G					
1/2	3/4	1	1 1/4	1 1/2	2
3.0	3.2	3.5	3.8	4.0	4.4

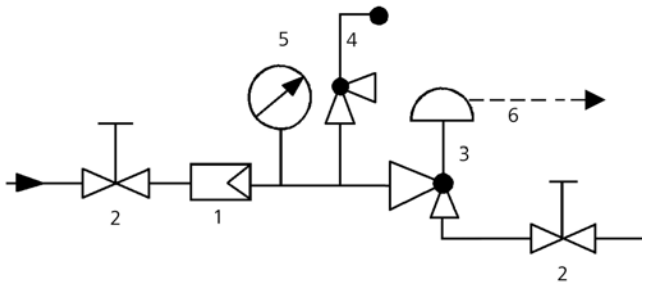
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 3/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 3.9

Millibar Control Valve

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	1 - 2,5
Inlet Pressure	0.01 - 1.1 bar
K_{vs}-Value	0.2 - 28 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 3.9 backpressure regulator is a spring-loaded diaphragm-controlled proportional control valve designed for very low inlet pressures. This bypass valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone can be fitted with a soft or metallic seal.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» all stainless steel construction

Options

» for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special connections:
Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} Values [m^3/h] for Straight-way Valve

G 1/2 DN 15	G 3/4 DN20	G 1 DN 25	G 1 1/4 DN 32	G 1 1/2 DN 40	G 2 DN 50
6	9	10	22	22	22

K_{vs}-Values [m^3/h] for angle and U-shaped valve

0.2	0.9	2.2	3.9	6	12	18	28

Setting Ranges [bar], Nominal Pressure

0.01 - 0.025	0.02 - 0.06	0.05 - 0.12	0.10 - 0.25	0.2 - 0.5	0.4 - 1.1
PN 1	PN 1	PN 1	PN 1	PN 1	PN 2.5

Pressure Control Valves

Backpressure Regulators UV 3.9

Millibar Control Valve

Materials		
Temperature	80 °C	130 °C
Body	CrNiMo-steel	CrNiMo-steel
Spring Cap		
Internals		
Spring		
Adjusting Screw		
Valve Seal	CrNiMo-steel optional EU	CrNiMo-steel optional FPM, EPDM, PTFE
Diaphragm	CR	FPM optional EPDM
Protection Foil for Diaphragm	PTFE (option)	PTFE (option)

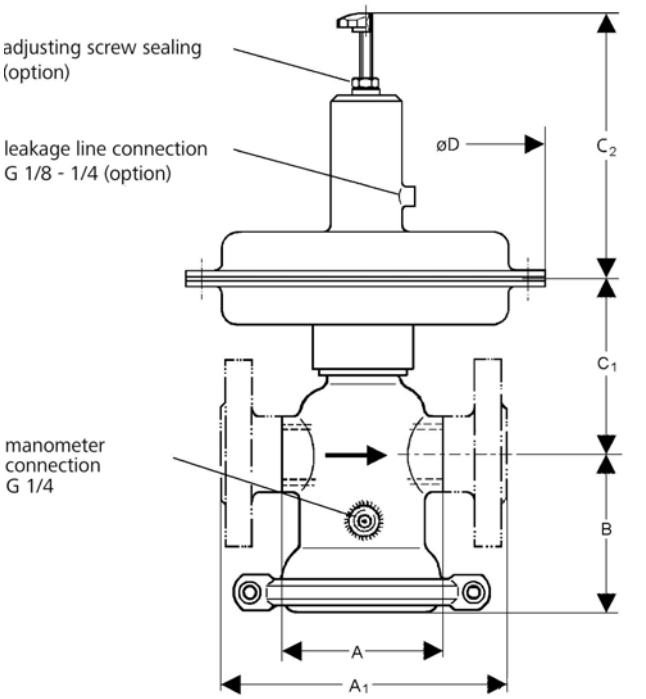
Dimensions [mm]							
setting range bar	size	nominal diameter					
		G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
		DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
all	A	85	91	85	130	145	185
all	A_1	130	150	160	180	200	230
all	B	85	85	85	100	100	100
all	C_1	105	105	105	125	125	125
all	C_2	250	250	250	250	250	250
0.4 - 1.1	ø D	175	175	175	175	175	175
0.2 - 0.5	ø D	220	220	220	220	220	220
0.1 - 0.25	ø D	270	270	270	270	270	270
0.05 - 0.12	ø D	360	360	360	360	360	360
0.02 - 0.06	ø D	500	500	500	500	500	500
0.01 - 0.025	ø D	500	500	500	500	500	500

Weights [kg]						
setting range bar	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
0.4 - 1.1	6	6	6	7	7	7
0.2 - 0.5	7	7	7	8	8	8
0.1 - 0.25	9	9	9	10	10	10
0.05 - 0.12	14	14	14	15	15	15
0.02 - 0.06	15	15	15	16	16	16
0.01 - 0.025	15	15	15	16	16	16

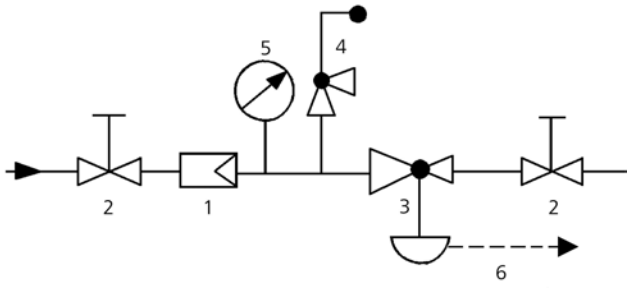
Weights[kg]						
setting ranges bar	nominal diameter DN					
	15	20	25	32	40	50
0.4 - 1.1	8	8	8	11	11	11
0.2 - 0.5	9	9	9	12	12	12
0.1 - 0.25	11	11	11	14	14	14
0.05 - 0.12	16	16	16	19	19	19
0.02 - 0.06	17	17	17	20	20	20
0.01 - 0.025	17	17	17	20	20	20

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 - 1/4 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 3.9

Millibar Control Valve

Materials		
Temperature	80 °C	130 °C
Body	CrNiMo-steel	CrNiMo-steel
Spring Cap		
Internals		
Spring		
Adjusting Screw		
Valve Seal	CrNiMo-steel optional EU	CrNiMo-steel optional FPM, EPDM or PTFE
Diaphragm	CR	FPM optional EPDM
Protection Foil for Diaphragm	PTFE (option)	PTFE (option)

Dimensions [mm]

setting range bar	size	nominal diameter					
		G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
		DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
0.4 - 1.1	A	50	45	-	-	-	-
	C_1	95	100	-	-	-	-
	ø D	175	175	-	-	-	-
0.2 - 0.5	A	55	55	55	-	-	-
	C_1	95	100	105	-	-	-
	ø D	220	220	220	-	-	-
0.1 - 0.25	A	75	75	75	75	75	-
	C_1	95	100	105	110	115	-
	ø D	270	270	270	270	270	270
0.05 - 0.12	A	90	90	90	90	90	90
	A_1	125	125	125	-	-	-
	C_1	95	100	105	110	115	120
	C_2	115	120	120	-	-	-
	ø D	360	360	360	360	360	360
0.01 - 0.025 0.02 - 0.06	A	80	80	80	80	80	80
	A_1	150	150	150	180	180	180
	C_1	95	100	105	110	115	120
	C_2	115	120	120	125	130	135
	ø D	500	500	500	500	500	500
alle	C_3	500	500	500	500	500	500

Weights[kg]

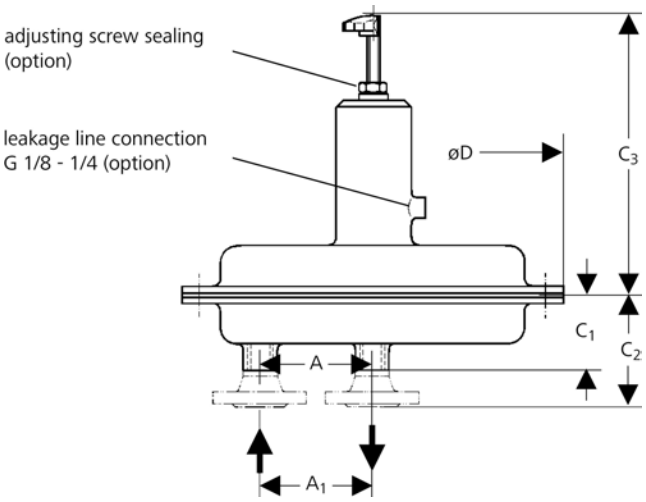
setting range bar	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
0.4 - 1.1	4.5	4.5	-	-	-	-
0.2 - 0.5	6	6	6	-	-	-
0.1 - 0.25	8	8	8	8	8	-
0.05 - 0.12	12.5	12.5	12.5	12.5	12.5	12.5
0.02 - 0.006	13	13	13	13	13	13
0.01 - 0.025	13	13	13	13	13	13

Weights[kg]

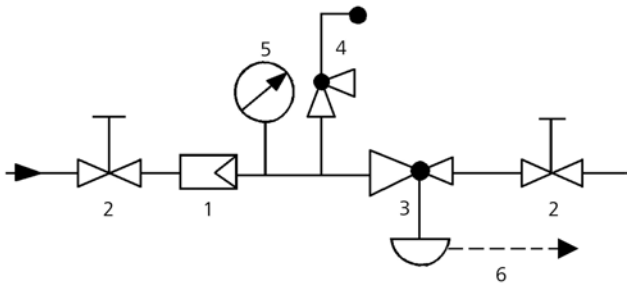
setting range bar	nominal diameter DN					
	15	20	25	32	40	50
0.4 - 1.1	-	-	-	-	-	-
0.2 - 0.5	-	-	-	-	-	-
0.1 - 0.25	-	-	-	-	-	
0.05 - 0.12	14	14.5	15	-	-	-
0.02 - 0.06	15.5	16	16.5	17.5	18	19.5
0.01 - 0.025	15.5	16	16.5	17.5	18	19.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 - 1/4 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 3.9

Millibar Control Valve

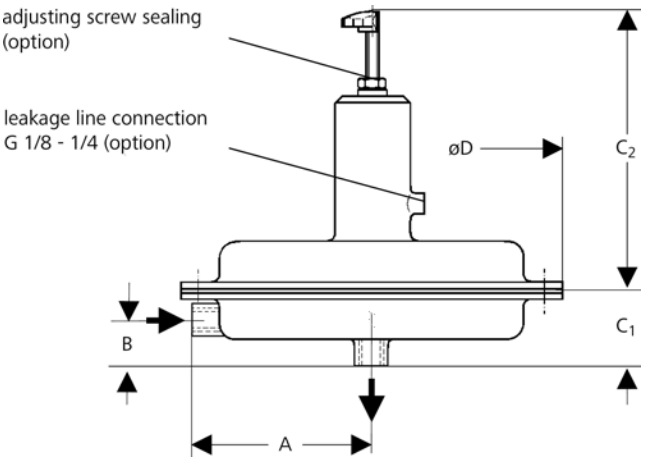
Materials		
Temperature	80 °C	130 °C
Body	CrNiMo-steel	CrNiMo-steel
Spring Cap		
Internals		
Spring		
Adjusting Screw		
Valve Seal	CrNiMo-steel optional EU	CrNiMo-steel optional FPM, EPDM or PTFE
Diaphragm	CR	FPM optional EPDM
Protection Foil for Diaphragm	PTFE (option)	PTFE (option)

Dimensions [mm]		
setting range bar	size	G 1/2
0.2 - 0.5	A	100
	B	65
	C_1	95
	ø D	220
0.1 - 0.25	A	126
	A_1	65
	C_1	95
	ø D	270
0.05 - 0.12	A	167
	A_1	65
	C_1	95
	ø D	360
alle Bereiche	C_2	250

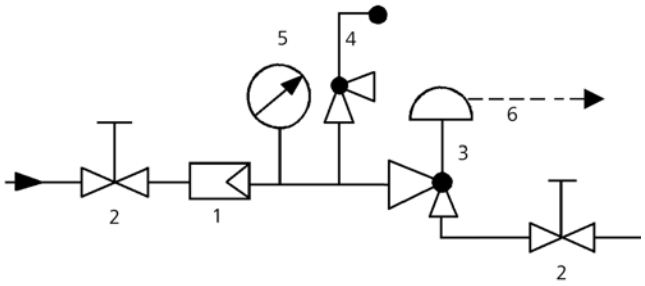
Weights [kg]	
setting range bar	G 1/2
0.2 - 0.5	6
0.1 - 0.25	8
0.05 - 0.12	12.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 - 1/4 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 4.1

Standard Cast Valve

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Inlet Pressure	0.02 - 10 bar
K_{vs}-Value	4 - 160 m^3/h
Temperature	200 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 4.1 backpressure regulator is a spring-loaded diaphragm-controlled proportional control valve designed for universal application and large volumes. The valve cone is fitted with a soft seal.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» open spring
» sense line connection

Options

» spring cap
» pneumatic actuation
» for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]					
nom. diam. DN	15	20	25	40	50
K_{vs}-value m^3/h	4	5	6	20	32

K_{vs}-Values [m^3/h]					
nom. diam. DN	65	80	100	125	150
K_{vs}-value m^3/h	50	80	100	140	160

Setting Ranges and max. Inlet Pressure [bar]						
setting range	0.02 - 0.25	0.1 - 0.6	0.2 - 1.2	0.8 - 2.5	2 - 5	4.5 - 10*
max. inlet press.	0.5	0.9	1.8	3.75	7.5	15

Pressure Control Valves

Backpressure Regulators UV 4.1

Standard Cast Valve

Materials			
Temperature	80 °C	130 °C	200 °C
Body	cast steel		
Diaphragm Housing	steel welded optional CrNiMo-steel		
Spring Cap	steel welded optional CrNiMo-steel		
Spring	spring steel C optional CrNiMo-steel		
Valve Seal	NBR	EPDM optional FPM	FEPM
Diaphragm	CR	EPDM optional FPM	FEPM
O-Ring	NBR	EPDM optional FPM	FEPM

Dimensions[mm]

setting range bar	size	nominal diameter DN									
		15	20	25	40	50	65	80	100	125	150
all ranges	A	130	150	160	200	230	290	310	350	400	480
	B	55	55	60	75	85	105	105	110	220	220
0.02-0.25 (0.05-0.25 > DN 125)	C	510	510	510	520	520	570	570	570	810	810
	C_1	640	640	640	680	680	730	730	730	970	970
	D	360	360	360	360	360	360	360	360	500	500
0.1 - 0.6	C	510	510	510	630	630	680	680	680	810	810
	C_1	640	640	640	790	790	840	840	840	970	970
	D	270	270	270	360	360	360	360	360	360	360
0.2 - 1.2	C	510	510	510	630	630	680	680	680	810	810
	C_1	640	640	640	790	790	840	840	840	970	970
	D	220	220	220	270	270	270	270	270	270	270
0.8 - 2.5	C	490	490	490	650	650	680	680	680	810	810
2 - 5 4.5 - 10	C_1	620	620	620	810	810	840	840	840	970	970
	D	175	175	175	220	220	220	220	220	220	220

Weights PN 16 [kg]

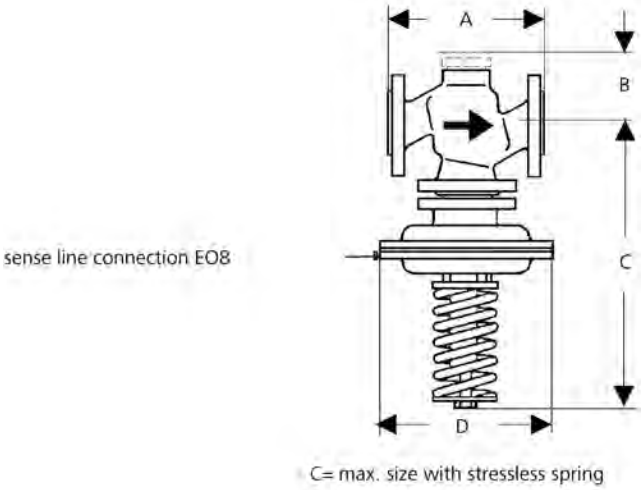
setting range bar	nominal diameter DN									
	15	20	25	40	50	65	80	100	125	150
0.02 - 0.25	24	24	25	37	40	65	68	72	112	132
0.1 - 0.6	26	26	27	39	42	67	70	74	114	134
0.2 - 1.2	22	22	23	35	38	63	66	70	110	130
0.8 - 10	20	20	21	33	36	61	64	68	108	128

Weights PN 40 [kg]

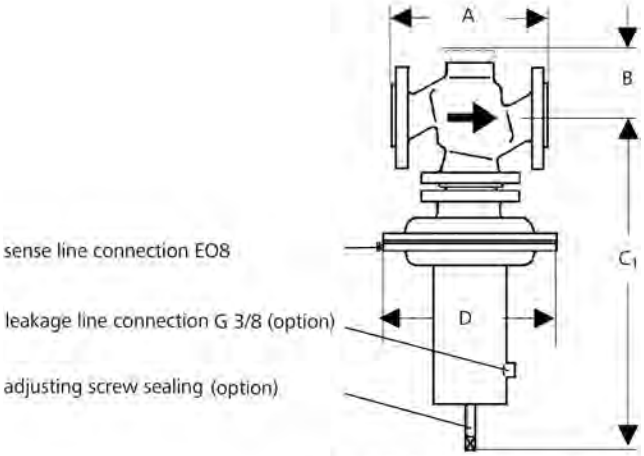
setting range bar	nominal diameter DN									
	15	20	25	40	50	65	80	100	125	150
0.02 - 0.25	25	25	26	40	42	68	72	75	120	145
0.1 - 0.6	27	27	28	42	44	70	74	77	122	147
0.2 - 1.2	23	23	24	38	40	66	70	73	118	143
0.8 - 10	21	21	22	36	38	64	68	71	116	141

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

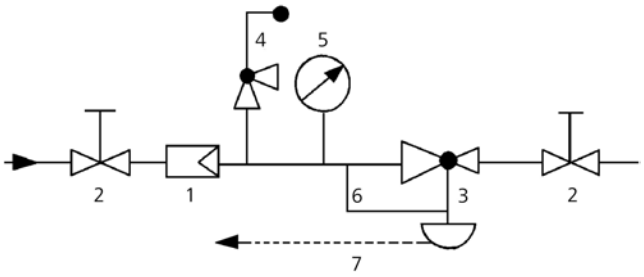


C= max. size with stressless spring



C_1= max. size with stressless spring

Recommended Installation



1 Strainer
2 Shut-off Valves
3 Backpressure Regulator
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN before the valve.
use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 4.4

Epoxy-coated Cast Valve for medium Flow Rates

Technical Data

Connection DN	50 - 150
Nominal Pressure PN	16, 25, 40
Inlet Pressure	max. 12 bar
K_{vs}-Value	17 - 155 m³/h
Temperature	70 °C
Medium	water

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 4.4 backpressure regulator is a piston-controlled, spring-loaded proportional regulator with relief for large throughputs. The valve housing is made of spheroidal graphite iron with a continuous epoxy coating while the valve cone is soft-sealed.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» body made of spheroidal graphite iron with an epoxy coating
» closed spring cap
» internal control bore

Options

» pressure gauge pre-installed
» other inlet pressure ranges on request
» special designs on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values[m³/h]					
nominal diameter DN					
50	65	80	100	125	150
17	29	43	68	104	155

Setting Ranges [bar], Nominal Pressure PN		
bar	1,5 - 6	5 - 12
PN	40	40

Pressure Control Valves

Backpressure Regulators UV 4.4

Epoxy-coated Cast Valve for medium Flow Rates

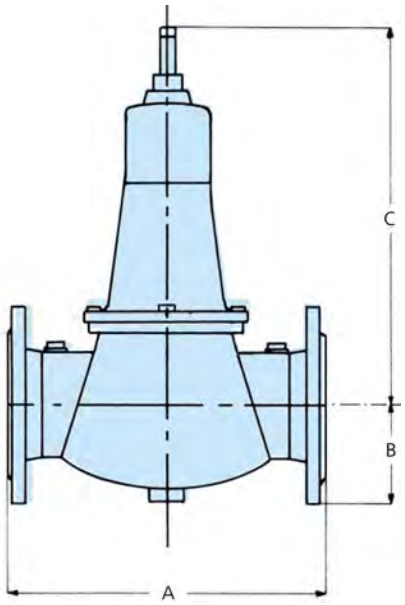
Materials	
Body	spheroidal cast iron epoxy coated
Spring Cap	spheroidal cast iron epoxy coated
Spring	stainless steel 55SiCr6
Internals	stainless steel
Valve Seal	NBR
O-ring (balance)	NBR

Dimensions [mm]						
size	nominal diameter DN					
	50	65	80	100	125	150
A	230	290	310	350	400	450
B	83	93	100	117	135	150
C	280	320	350	420	590	690

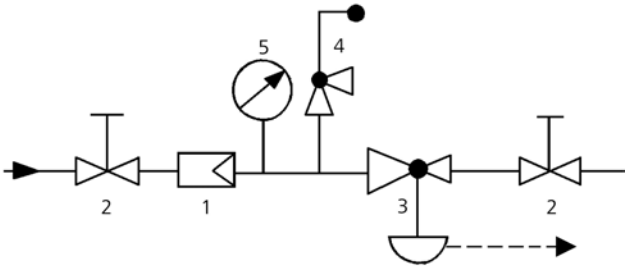
Weights [kg]					
nominal diameter DN					
50	65	80	100	125	150
12	19	24	34	56	74

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 3/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 4.7, 4.8

Valves for Aggressive Media and Large Flow Rates

Technical Data

Connection DN	50 - 100
Nominal Pressure PN	16
Inlet Pressure	0.02 - 10 bar
K_{vs}-Value	32 - 100 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 4.7 and 4.8 backpressure regulators are spring-loaded diaphragm-controlled and balanced proportional control valves for large volumes. The valve cone is fitted with a soft seal (up to 130 °C). This bypass valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

The valves requires a sense line (to be installed on-site).

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» all stainless steel construction
» sense line connection

Options

» for toxic or hazardous media:
sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special connections:
Aseptic, ANSI or JIS flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]			
nominal diameter DN			
50	65	80	100
32	50	80	100

Setting Ranges [bar], Nominal Pressure						
4.5 - 10	2 - 5	0.8 - 2.5	0.2 - 1.2	0. - 0.6	0.02 - 0.25	0.02 - 0.15
PN 16	PN 10	PN 6	PN 2.5	PN 1	PN 1	PN 1

Pressure Control Valves

Backpressure Regulators UV 4.7, 4.8

Valves for Aggressive Media and Large Flow Rates

Materials	
Temperature	130 °C
Body	CrNiMo-steel
Diaphragm Housing	CrNiMo-steel
Spring Cap	CrNiMo-steel
Spring	CrNi-steel
Valve Seal	EPDM optional FPM
Diaphragm	EPDM optional FPM
O-Ring	EPDM optional FPM

Dimensions [mm]

setting range bar	DN 50				DN 65			
	A	C	C_1	D	A	C	C_1	D
4.5 - 10	230	610	750	220	290	750	890	220
2 - 5	230	610	750	220	290	750	890	220
0.8 - 2.5	230	610	750	220	290	750	890	220
0.2 - 1.2	230	610	750	270	290	750	890	270
0.1 - 0.6	230	610	750	360	290	750	890	360
0.02 - 0.25	230	500	640	360	290	640	780	360
0.02 - 0.15	230	500	640	500	290	640	780	500

Dimensions [mm]

setting range bar	DN 80				DN 100			
	A	C	C_1	D	A	C	C_1	D
4.5 - 10	310	750	890	220	350	750	890	220
2 - 5	310	750	890	220	350	750	890	220
0.8 - 2.5	310	750	890	220	350	750	890	220
0.2 - 1.2	310	750	890	270	350	750	890	270
0.1 - 0.6	310	750	890	360	350	750	890	360
0.02 - 0.25	310	640	780	360	350	640	780	360
0.02 - 0.15	310	640	780	500	350	640	780	500

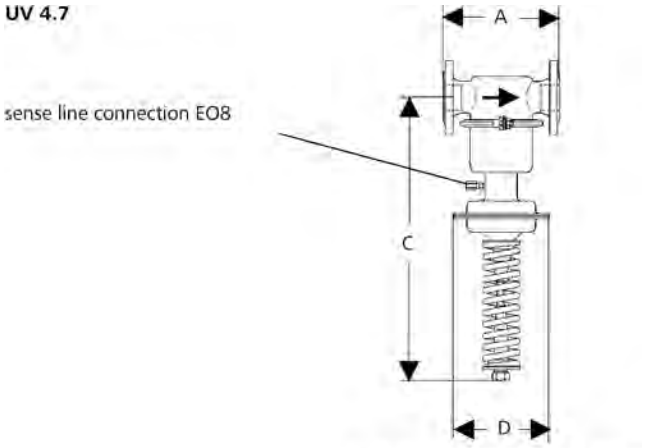
Weights [kg]

setting range bar	nominal diameter DN			
	50	65	80	100
4.5 - 10	30	31	33	35
2 - 5	30	31	33	35
0.8 - 2.5	30	31	33	35
0.2 - 1.2	33	34	36	38
0.1 - 0.6	36	37	39	41
0.02 - 0.25	37.5	38.5	38.5	38.5
0.02 - 0.15	37.5	38.5	38.5	38.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

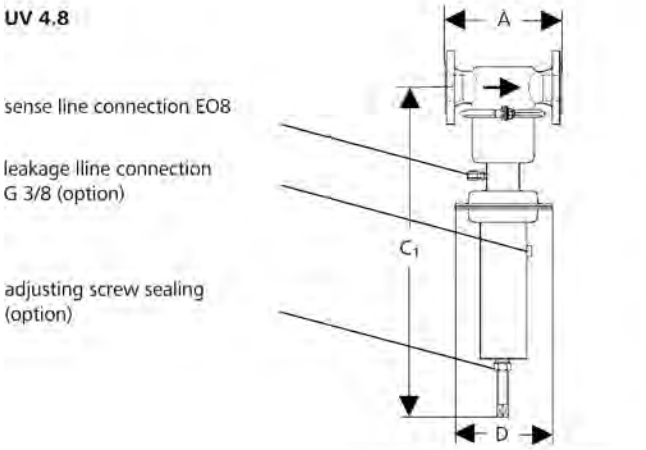
Dimensional Drawing

UV 4.7



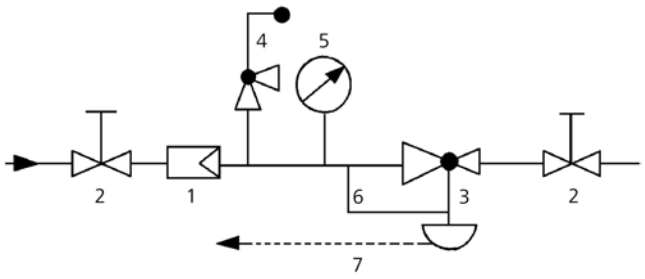
C= max. size with stressless spring

UV 4.8



C_1 = max. size with stressless

Recommended Installation



1 Strainer
2 Shut-off Valves
3 Backpressure Regulator
4 Safety Valves
5 Pressure Gauge
6 Sense Line EO8
7 Leakage Line G 3/8 (option)

sense line connection 10 - 20 x DN before the valve.
use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 5.1

Universal Valve

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16
Inlet Pressure	0.02 - 12 bar
K_{vs}-Value	3,5 - 22 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 5.1 backpressure regulator is a spring-loaded diaphragm-controlled and balanced proportional control valve for universal application. This bypass valve is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

The spring module comprising spring cap, spring, adjusting screw, diaphragm and internal components, is connected to the valve body only by means of a clamp ring and two bolts. Changing the diaphragm or the complete spring assembly for a different control pressure range is extremely simple and does not call for special tools. The same applies to servicing and maintenance.

Changing the control pressure setting does not affect the height of the valve (non rising adjusting screw).

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» pressure gauge connection
» pneumatic actuation
» for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]							
nom. diam.	DN	15	20	25	32	40	50
	G	1/2	3/4	1	1 1/4	1 1/2	2
K_{vs}-value m^3/h		3.5	3.5	4	22	22	22

Setting Ranges [bar], Nominal Pressure				
setting range	6 - 12	4 - 8	2 - 5	0.8 - 2.5
nominal pressure	PN 16	PN 16	PN 10	PN 6

Setting Ranges [bar], Nominal Pressure			
setting range	0.3 - 1.1	0.1 - 0.5	0.02 - 0.12
nominal pressure	PN 2.5	PN 1	PN 1

Pressure Control Valves

Backpressure Regulators UV 5.1

Universal Valve

Materials	
Temperature	130 °C
Body	CrNiMo-steel
Spring Cap	CrNiMo-steel
Internals	CrNiMo-steel
Screws	CrNiMo-steel
Adjusting Screw	CrNiMo-steel
Valve Seal	EPDM optional FPM or PTFE
Spring	CrNi-steel
Diaphragm	EPDM optional FPM
Protection Foil for Diaphragm	PTFE (option)

Dimensions[mm]

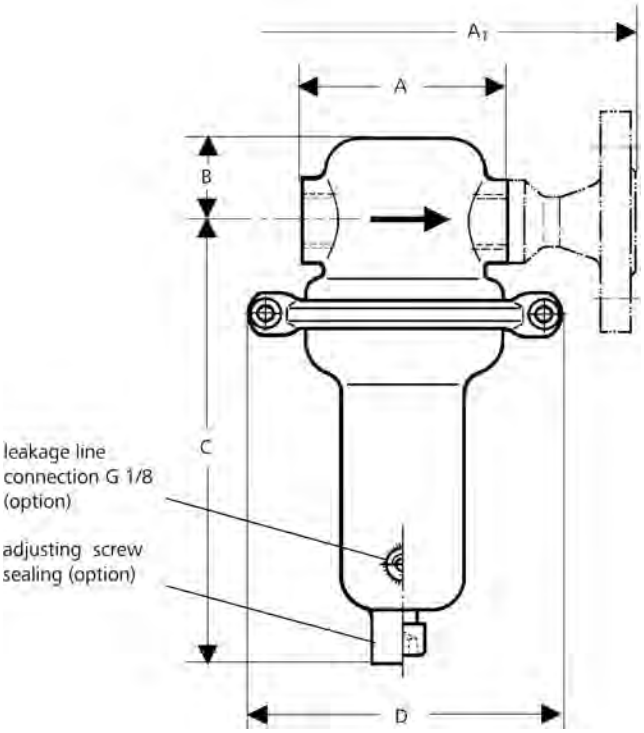
setting range bar	size	nominal diameter					
		G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
		DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
all ranges	A	90	90	136	130	145	185
	A_1	200	200	200	180	200	230
	B	40	40	40	110	110	110
0.02-0.12	C	270	270	270	285	285	285
	D	360	360	360	360	360	360
0.1 - 0.5	C	270	270	270	285	285	285
	D	264	264	264	264	264	264
0.3 - 1.1	C	270	270	270	285	285	285
	D	200	200	200	200	200	200
0.8 - 12	C	205	205	205	218	218	218
	D	138	138	138	138	138	138

Weights [kg]

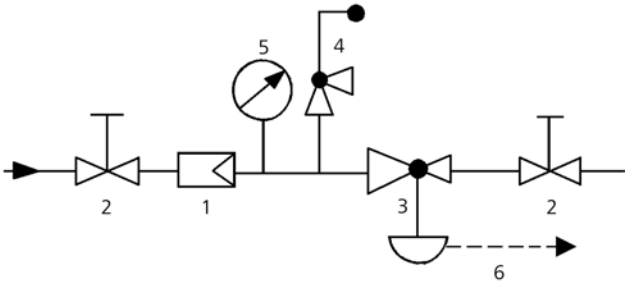
setting range bar	nominal diameter			
	G 1/2 - 1	G 1 1/4 - 2	DN 15 - 25	DN 32 - 50
0.02 - 0.12	13	14.4	14	16.4
0.1 - 0.5	6.5	8	7.5	10
0.3 - 1.1	5.5	7	6.5	9
0.8 - 12	2.5	4	3.5	6

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line G 1/8 (option)

use MANKENBERG-Products

Pressure Control Valves

Backpressure Regulators UV 6906

Diaphragm Controlled for „Low Flow“

Technical Data

Connection G / NPT	1/4
Inlet Pressure	0 - 20 bar
max rated pressure	up to 50 bar
K_{vs}-Value	0.09 m³/h
C_{vs}-Value	0.1 US gal/min.
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 6906 backpressure regulator is a diaphragm-controlled spring-loaded proportional control valve for set pressures up to 20 bar. The especially developed Inconel X750 diaphragm lasts at least 50% longer than typical stainless steel designs. Body and spring cap are made of stainless steel (316) featuring excellent corrosion resistance.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Turning the handwheel clockwise increases the inlet pressure.

Standard

» 316SS body and spring cap
» Nylon handwheel
» bubble tight at max. working pressure (tested with Nitrogen)

Options

» counter nut for panel-mounting
» special versions on request

Application

» gas, fuel and liquid analyzer systems
» blanketing applications
» laboratories & research labs
» portable calibration kits
» medium pressure reactor vessels
» instrument air lines

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Kvs Value [m³/h]	Cvs Value [US gal/min.]
0.09	0.1

Setting Ranges [bar]		
0 - 5	0 - 10	0 - 20

Pressure Control Valves

Backpressure Regulators UV 6906

Diaphragm Controlled for „Low Flow“

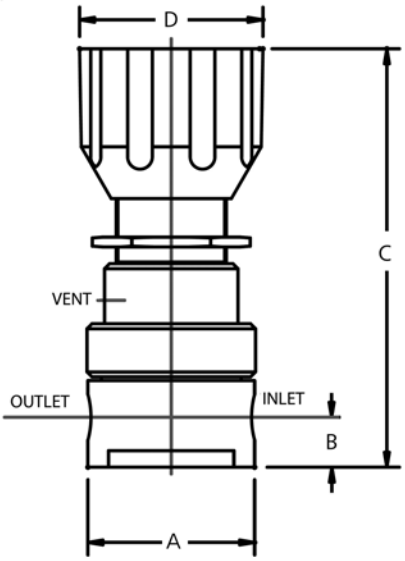
Materials	
Body, Spring Cap	CrNiMo-steel
Main Valve Pin	CrNiMo-steel
Spring	Inconel X750
Loading Spring	CrNi-steel
Valve Seal	PEEK or PCTFE
Diaphragm	Inconel X750
Diaphragm Washer	Brass
O-Rings	Viton
Handwheel	Nylon
Adjusting Screw	Ali Bronze

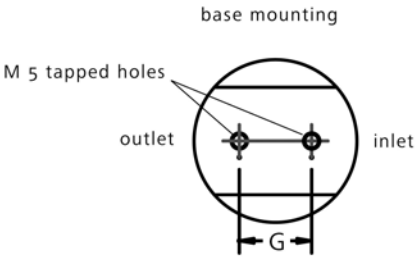
Dimensions [mm]	
A	50
B	15
C_{min}	117.6
C_{max}	129.6
D	55
E	34
G	22.2

Weights [kg]
0.9

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Pressure Control Valves

Backpressure Regulators UV 6907

Piston Controlled for „Low Flow

Technical Data

Connection G / NPT	1/4
Inlet Pressure	0 - 150 bar
max rated pressure	up to 225 bar
K_{vs}-Value	0.09 or 0.43 m^3/h
C_{vs}-Value	0.1 or 0.5 US gal/min.
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 6907 backpressure regulator is a pistin-controlled, spring-loaded proportional control valve for set pressures up to 150 bar. Body and spring cap are made of stainless steel (316) featuring excellent corrosion resistance.

The outlet pressure to be controlled is balanced across the control unit by the force of the valve spring (set pressure). As the outlet pressure rises above the pressure set using the adjusting screw, the valve cone moves towards the seat and the volume of medium is reduced. As the outlet pressure drops, the valve control orifice increases; when the pipeline is depressurised, the valve is open. Rotating the adjusting screw clockwise increases the outlet pressure.

Standard

» 316SS body and spring cap
» Nylon handwheel
» bubble tight at max. working pressure (tested with Nitrogen)

Options

» counter nut for panel-mounting
» special versions on request

Application

» gas, fuel and liquid analyzer systems
» blanketing applications
» laboratories & research labs
» portable calibration kits
» medium pressure reactor vessels
» instrument air lines

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} Value [m^3/h]	**C_{vs} Value [US gal/min.]**
0.09 or 0.43	0.1 or 0.5

Setting Ranges [bar]				
C_v 0.1	0 - 10	0 - 20	0 - 35	0 - 70
C_v 0.5	0 - 10	0 - 20	0 - 35	0 - 150

Pressure Control Valves

Backpressure Regulators UV 6907

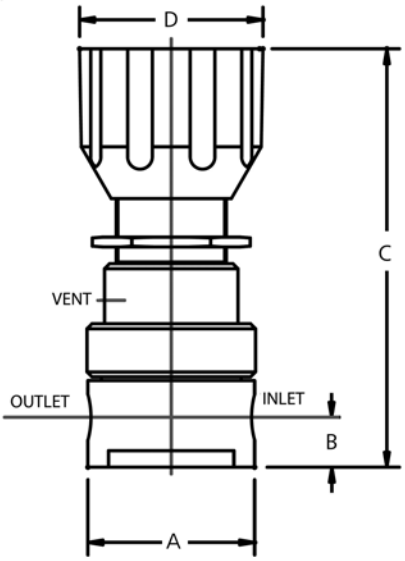
Piston Controlled for „Low Flow

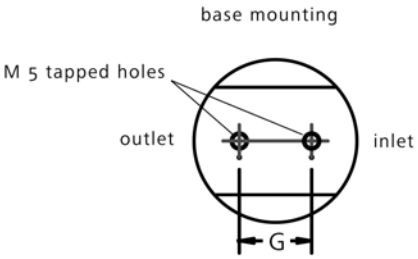
Materials	
Body, Spring Cap	CrNiMo-steel
Main Valve Pin	CrNiMo-steel
Spring	Inconel X750
Loading Spring	CrNi-steel
Valve Seal	PEEK or PCTFE
O-Rings	Viton
Handwheel	Nylon
Adjusting Screw	Ali Bronze

Dimensions [mm]	
size	G / NPT 1/4
A	50
B	15
C_{min}	125.6
C_{max}	137.6
D	55
E	34

Weights [kg]
0,9

Dimensional Drawing





Pressure Control Valves

Backpressure Regulators UV 8.2

Valve for High Pressures for Medium Flow Rates

Technical Data

Connection DN	15 - 50
Connection G	3/8 - 2
Nominal Pressure PN	100
Inlet Pressure	2 - 100 bar
K_{vs}-Value	0.2 - 5.5 m^3/h
Temperature	400 °C
Medium	liquids, gases and steam

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The UV 8.2 backpressure regulator is a diaphragm, piston or bellows-controlled spring-loaded proportional control valve for high pressures and small volumes. It can be supplied with three types of connections: sockets, flanges and welding spigots. Each size of valve may be fitted with three different seats. The valve cone may be fitted with a soft or metallic seal.

The inlet pressure to be controlled is balanced across the valve seat by the force of the valve spring (set pressure). If the inlet pressure rises above the set pressure, the valve opens. With decreasing inlet pressure the valve control orifice reduces, when the pipeline is depressurised, the valve is closed. Rotating the adjusting screw clockwise increases the inlet pressure.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» metallic valve seal

Options

» pressure gauge connection
» soft seal
» hard-faced valve cone and seat
» for toxic or hazardous media: sealed spring cap complete with leakage line connection (incl. sealed adjusting screw). Must be installed with a leakage line capable of draining leaking medium safely and without pressure
» various diaphragm and seal materials suitable for your medium
» special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
» special connections: ANSI or JIS flanges, NPT, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]					
nominal diameter	G	3/8	1/2	3/4	1
	DN		15	20	25
seat	I	0.2	0.2	0.25	0.25
	II	0.9	0.9	0.9	0.9
	III	1.7	1.8	2	2.2

K_{vs}-Values [m^3/h]				
nominal diameter	G	1 1/4	1 1/2	2
	DN	32	40	50
seat	I	0.4	0.4	1
	II	2.5	2.5	3.5
	III	3.9	3.9	5.5

Setting Range [bar], Nominal Diameter*				
2 - 4	4 - 7	7 - 10	5 - 16	10 - 20
PN 6	PN 16	PN 16	PN 25	PN 25

Setting Ranges [bar], Nominal Pressure*				
10 - 25	20 - 35	35 - 50	45 - 63	60 - 100
PN 40	PN 63	PN 100	PN 100	PN 100

* inlet and outlet pressure

Pressure Control Valves

Backpressure Regulators UV 8.2

Valve for High Pressures for Medium Flow Rates

Materials		
Temperature	130 °C	400 °C
Body	G 3/8 - 1, DN 15 - 25 = C-steel G 1 1/4 - 2, DN 32 - 50 = steel welded optional CrNiMo-steel for all diameters	
Spring Cap	steel welded optional CrNiMo-steel	
Internals	CrMo-steel or CrNiMo-steel	CrNiMo-steel
Spring	CrNi-steel	CrNi-steel
Metallic Seal	CrNiMo-steel	CrNiMo-steel
Diaphragm	FPM optional EPDM	-
Protection Foil	PTFE (option)	-
O-Ring for Piston	FPM optional EPDM or PTFE	-
Bellow	-	CrNiMo-steel

Dimensions [mm] Globe Design				
size	nominal diameter			
	G 3/8	G 1/2	G 3/4	G 1
	-	DN 15	DN 20	DN 25
A	110	110	110	110
A_1	220	220	220	220
B	30	30	30	30
C	420	420	420	420

size C with bellow + 130 mm

Dimensions [mm] Elbow Design				
size	nominal diameter			
	G 3/8-1	G 1 1/4	G 1 1/2	G 2
	DN 15 - 25	DN 32	DN 40	DN 50
A	55	100	100	100
A_1	110	*	*	*
B	65	108	108	108
B_1	120	*	*	*
C	420	650	650	650

size C with bellow + 130 mm
* on request

Weights [kg] BSP female connection						
nominal diameter						
G 3/8	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
13	13	13	13	21	21	21

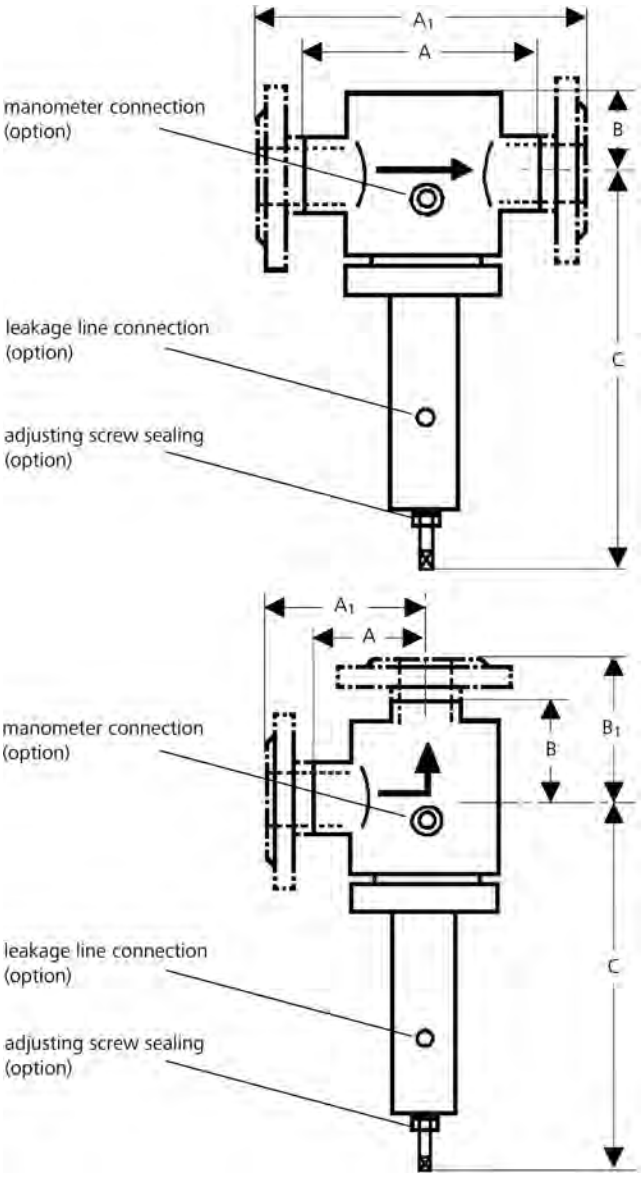
with bellow + 4 kg

Weights [kg] flange connection						
nominal pressure PN	nominal diameter					
	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
16 - 40	16	16.2	16.6	25.8	26.8	27.8
63	16.4	17.6	19.4	27	30.6	31.4
100	16.4	17.6	19.4	27.4	30.6	36.4

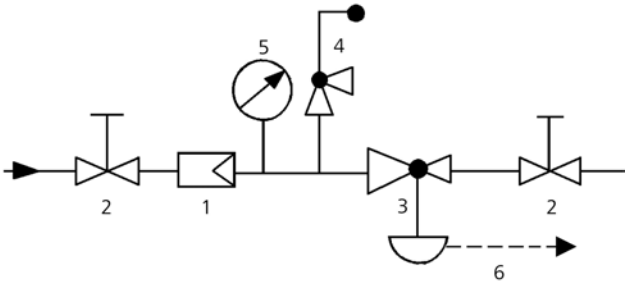
with bellow + 4 kg

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



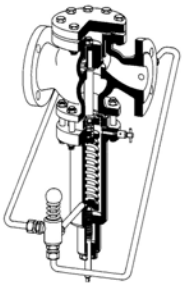
1 Strainer
2 Shutoff valves
3 Backpressure Regulator
4 Safety Valve
5 Pressure Gauge
6 Leakage Line (option)

use MANKENBERG-Products

Pressure Control Valves

Burst Pipe Isolating Valves

Cast Valve for high Flow Rates			RS 219
for high pressures and large volume flows / shuts off pipelines in case of a leakage, automatic locking after response / suitable for liquids / body made of GG-25, GGG-40, GS-C 25			
DN	32 - 100	PN	16 - 40
K_{vs}	14 - 65 m^3/h	T	130 °C



Burst Pipe Isolating Valve for Hazardous Media			RS 659
shuts off pipelines in case of a leakage, automatic locking after response | suitable for liquids, gases, steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm			
DN	15 - 50	G	1/2 - 2
PN	16	K_{vs}	5 - 22 m^3/h
T	130 °C		

Pressure Control Valves

Burst Pipe Isolating Valves RS 219

Cast Valve for high Flow Rates

Technical Data

Connection DN	32 - 100
Nominal Pressure PN	16 - 40
Cut Off Flow Rate	min. 15 % above operating flow
K_{vs}-Value	14 - 65 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

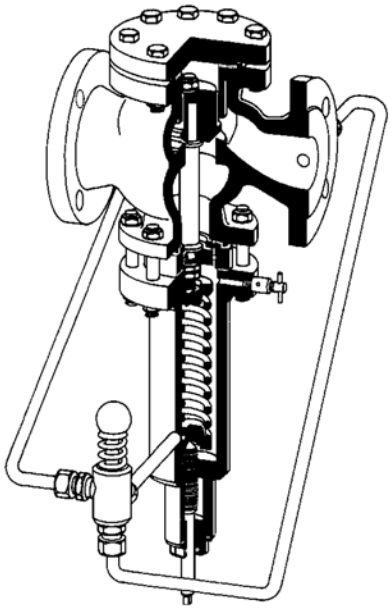
Leaking or broken pipes or hoses may only result in flooding but can, if the escaping fluids are flammable, water-polluting or toxic, have catastrophic consequences. For this reason pipe break isolating valves are fitted on the inlet side of such systems. These valves are set to a certain flow volume and shut off reliably and without delay as soon as this flow volume is exceeded.

RS 219 is a piston-controlled spring-loaded pipe break isolating valve. Depending on the medium the valve cone can be fitted with a soft or metallic seal.

When the pipeline is depressurised the valve is open. Under operating conditions the small pressure drop caused by the pipe break isolating valve acts on the piston/spring system. If the flow volume increases beyond the set value, an imbalance is introduced between the pressure acting on the piston and the force of the spring causing the cone to close. The resulting increase in the flow resistance reinforces the closing force of the piston and causes the complete shutoff of the pipe section. The closing or shutoff speed may be adjustable. Once the fault has been removed the valve can be re-opened and re-activated by pushing the button on the pilot valve. Rotating the adjusting screw clockwise increases the shutoff trigger volume. In special cases an adjustable shutoff delay may be fitted.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



K_{vs}-Values [m^3/h]						
nom. diam. DN	32	40	50	65	80	100
K_{vs}-value m^3/h	14	18	20	40	50	65

Pressure Control Valves

Burst Pipe Isolating Valves RS 219

Cast Valve for high Flow Rates

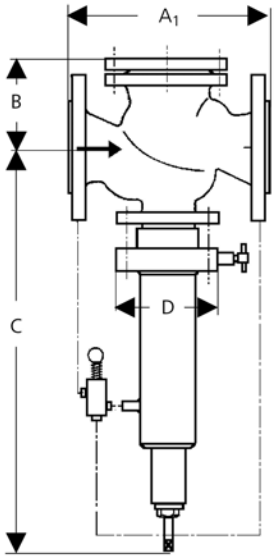
Materials			
Temperature		80 °C	130 °C
Body	PN 16	up to DN 25 grey cast iron, ab DN 40 spherodial cast iron	
	PN 25/40	cast steel	cast steel
Spring Cap		steel welded	steel welded
Internals		Cr-steel, CrNi-steel	Cr-steel, CrNiMo-steel
Adjusting Screw		steel	steel
Valve Seal		NBR or CrNiMo-steel	EPDM or CrNiMo-steel
Spring		CrNi-steel	CrNi-steel
O-Ring		NBR	EPDM
Pipework		CrNiMo-steel	CrNiMo-steel

Dimensions [mm]						
size	nominal diameter DN					
	32	40	50	65	80	100
A1	180	200	230	290	310	350
B	125	125	125	180	180	180
C	480	480	480	560	560	560
D	115	115	115	165	165	165

Weights on request.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pressure Control Valves

Burst Pipe Isolating Valves RS 659

Burst Pipe Isolating Valve for Hazardous Media

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16
Cut Off Flow Rate	min. 15 % above operating flow rate
K_{vs}-Value	5 - 22 m³/h
Temperature	130 °C
Medium	liquids and gases

Description

Leaking or broken pipes or hoses may only result in flooding but can, if the escaping fluids are flammable, water-polluting or toxic, have catastrophic consequences. For this reason pipe break isolating valves are fitted on the inlet side of such systems. These valves are set to a certain flow volume and shut off reliably and without delay as soon as this flow volume is exceeded.

RS 659 is a piston-controlled spring-loaded pipe break isolating valve. The valve cone is fitted with a soft seal.

When the pipeline is depressurised the valve is open. Under operating conditions the small pressure drop caused by the pipe break isolating valve acts on the piston/spring system. If the flow volume increases beyond the set value, an imbalance is introduced between the pressure acting on the piston and the force of the spring causing the cone to close. The resulting increase in the flow resistance reinforces the closing force of the piston and causes the complete shutoff of the pipe section. The closing or shutoff speed may be adjustable. Once the fault has been removed the valve can be re-opened and re-activated by pushing the button on the pilot valve. Rotating the adjusting screw clockwise increases the shutoff trigger volume. In special cases an adjustable shutoff delay may be fitted.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m³/h]							
nom. diam.	G	1/2	3/4	1	1 1/4	1 1/2	2
	DN	15	20	25	32	40	50
K_{vs}-value	m<³/h	5	7	8	22	22	22

Pressure Control Valves

Burst Pipe Isolating Valves RS 659

Burst Pipe Isolating Valve for Hazardous Media

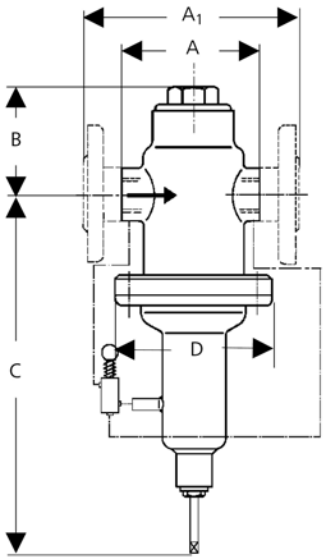
Materials	
Body	CrNiMo-steel
Spring Cap	CrNiMo-steel
Internals	CrNiMo-steel
Spring	CrNi-steel
Adjusting Screw	CrNiMo-steel
Pipework	CrNiMo-steel
Valve Seal	FEPM optional EPDM, FPM or PTFE
O-Ring	EPDM optional FPM, FEPM or PTFE

Dimensions [mm]						
size	nominal diameter					
	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
A	125	125	125	180	190	230
A_1	130	150	160	180	200	230
B	76	76	76	88	88	88
C	~ 400	~ 400	~ 400	~ 400	~ 400	~ 400
D	135	135	135	135	135	135

Weights on request.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pressure Control Valves

Flow Control and Differential Pressure Valves

Valves Fabricated to Meet your Needs			DV 652
Please let us have your operating data (medium, volume flow, pressure range, temperature, requested function and any further requirements) and a description of the application.			
DN	in compliance to your requirements	G	in compliance to your requirements
PN	in compliance to your requirements	p_2	in compliance to your requirements
Q	in compliance to your requirements	T	in compliance to your requirements

Pressure Control Valves

Flow Control and Differential Pressure Valves DV 652

Valves Fabricated to Meet your Needs

Technical Data

Connection DN	in compliance to your requirements
Connection G	in compliance to your requirements
Nominal Pressure PN	in compliance to your requirements
Outlet Pressure	in compliance to your requirements
Flow Rate	in compliance to your requirements
Temperature	in compliance to your requirements
Medium	in compliance to your requirements

Description

Mengenregler begrenzen Mengen bzw. Durchfluss unabhängig von Vor- oder Hinterdruck ohne zusätzliche Mess- und Auswertungseinrichtungen. Sie arbeiten unabhängig von externer Hilfsenergie und benötigen keine zusätliche pneumatische oder elektrische Steuerteile.

Basis Druckminderventil: bei druckloser Leitung ist das Ventil geöffnet und schließt, sobald der eingestellte Differenzdruck überschritten wird.

Basis Überströmventil: bei druckloser Leitung ist das Ventil geschlossen und öffnet, sobald der eingestellte Differenzdruck unterschritten wird. Der gewünschte Differenzdruck kann durch Vorspannen / Entlasten der Feder über ein Handrad eingestellt werden.

Pressure Control Valves

Vacuum Breakers and Vacuum Control Valves

Vacuum Breaker with Setting Scale			VV 34, 35, 36
VV 34 with spring cap (CrNiMo steel) and setting scale, VV 35 screw-in version | VV 36 without spring cap and setting scale | suitable for liquids and gases | body made of CrNiMo steel, flange of steel, CrNiMo steel | available in special materials, e.g. seawater resistant material, NACE compatible | nearly universally usable			
DN	20 - 250	G	1/2A - 2 1/2A
PN	6 - 40	p_2	0.05 - 0.95 bar
K_{vs}	1.2 - 388 m^3/h	T	300 °C

Know How Vacuum Valves

Vacuum breakers protect vessels and pipelines against vacuum. A vacuum can build up when a system is being drained, when it cools down or when a pump fails. Vacuum control valves are pressure reducing or overflow valves which control pressures below 1 bara.

Vacuum control valves
See Kow How pressure reducing valves and overflow valves.

Vacuum breakers

Operation
Vacuum breakers protect installations, vessels etc. against vacuum. They are normally closed. If the pressure inside a tank or vessel drops below atmospheric pressure by more than the set differential pressure, the valve opens causing the system to be vented until the set pressure difference has been established again. Vacuum breakers remain closed when the pressure rises above atmospheric; therefore they do not offer protection against excessive pressure.

Selecting valve type and nominal diameter
Vacuum breakers should be selected according to the pressure difference between the atmospheric pressure and the pressure inside the vessel or pipeline, not according to the vacuum or absolute pressure in the vessel or pipeline. All specifications given in data sheets or tables or on the scales of valves etc., relate to this differential pressure. Another factor which must be taken into account when selecting a vacuum valve is the suction capacity. For very small differential pressures vacuum control valves can be used as vacuum breakers.

Vacuum breaker capacity table
Please use the capacity table to select your vacuum breaker. The table applies to valve types 34, 35 and 36. On the left side you will find the nominal diameter; at the top (horizontally) you find the differential pressure given in bar at which the valve opens.

Full opening at set pressure
For applications which require a vacuum breaker to open fully at the set pressure (to prevent a further rise in vacuum), our weight-loaded vacuum breakers type 43 or 44 should be used.

Seat leakage
In their standard form vacuum breakers are supplied with a metallic cone seal which requires less maintenance than a soft seal. For more stringent leakage specifications these valves can be supplied with soft seals. As vacuum breakers may remain in closed position for longer periods, a soft seal tends to stick to the valve seat. The correct functioning of such valves can therefore be guaranteed only if they are serviced frequently and carefully. Also the soft elastomer seal limits the maximum possible operating temperature.

Protecting your system
If toxic or hazardous media are used measures must be taken to ensure that in the case of cone failure the hazardous medium can be drained in a controlled and safe manner. In such a case we reccomend our type 33 with closed valve body and spring cap.

Protecting the vacuum breaker
As the suction orifices are open to atmosphere, they should be adequately protected against the ingress of dust, dirt or insects. If there is a danger of freezing the vacuum breaker should by fitted with a heating-jacket.

Setting the valve
The performance curves shown in the flow capacity diagram relate to fully open valves. To obtain these values under partial load conditions, the operating pressures on the scales of valve types 34 and 35 should always be set 0.05 bar below the pressures given in the diagram. The reason for this is the spring force which increases as the flow and cone movement increase.

Maintenance
Vacuum breakers should be cleaned and serviced regularly. Depending on the ambient operating conditions, the valve spindle should regularly be checked for freedom of movement. The service intervals should be specified in a maintenance schedule.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, operating instruction etc. MUST be followed.

Selection Vacuum Breaker

Selection

nominal pressure PN	differential pressure bar	T °C	K_{vs}-value m^3/h	connection		notes	type
				G	DN		
16 - 40	0.05 - 0.95	300	1.5 - 70		20 - 100	bonnet with scale	34
16 - 40	0.05 - 0.5	300	107 - 388		125 - 250	bonnet with scale	34
16 - 40	0.05 - 0.95	300	1.5 - 25	3/4 - 2 1/2		bonnet with scale	35
16 - 40	0.05 - 0.1	300	1.2 - 25	1/2 - 2 1/2		open spring, without scale	36

flow rate in m^3/h
vacuum breaker VV 34, 35, 36, 43 und 44

nominal diameter	differential pressure (set pressure) [bar]					
	≥ 0.47	0.4	0.3	0.2	0.1	0.05
G 1/2					12	7
G 3/4	41	37	32	26	18	10
G 1	71	66	57	46	33	18
G 1 1/4	127	117	102	82	58	32
G 1 1/2	199	183	158	129	91	50
G 2	348	320	278	227	160	87
G 2 1/2	551	507	439	359	254	139
DN 20	41	37	32	26	18	10
DN 25	71	66	57	46	33	18
DN 32	127	117	102	82	58	32
DN 40	199	183	158	129	91	50
DN 50	348	320	278	227	160	87
DN 65	551	507	439	359	254	139
DN 80	891	819	710	580	410	225
DN 100	1514	1393	1207	986	697	382
DN 125	2316	2129	1846	1507	1065	584
DN 150	3664	3369	2921	2385	1686	923
DN 200	5768	5303	4597	3753	2654	1453
DN 250	8387	7711	6685	5458	3859	2114

The specified flow rate refer to a full open valve. To get these flow rates the scale setting for type 34 and 35 must be 0.05 bar lower then the Δp tabular values. Type 36 is fully adjusted.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pressure Control Valves

Vacuum Breakers and Vacuum Control Valves VV 34, 35, 36

Vacuum Breaker with Setting Scale

Technical Data

Connection DN	20 - 250
Connection G	1/2A - 2 1/2A
Nominal Pressure PN	6 - 40
Setting Range	0.05 - 0.95 bar
K_{vs}-Value	1.2 - 388 m^3/h
Temperature	300 °C

Description

Vacuum breakers – also called vacuum venting valves or vacuum limiters - are valves which allow air to be aspirated once a set vacuum or pressure difference to atmosphere is reached. These valves are installed on pipelines, vessels, machines and equipment and are used, for instance, for venting tanks, limiting the vacuum in vacuum systems and protecting steam installations.

Under normal operating conditions the valve is kept closed by a pre-loaded spring and the internal vacuum acting on the valve cone. If the vacuum drops below the value set by means of the spring, the valve is opened by the atmospheric pressure and air enters the system. With increasing air flow the cone stroke and spring force increase. The pressure difference increases accordingly.

The VV 34 and VV 35 vacuum breakers have a tension spring and a spring cap complete with scale for setting the breaking pressure.

For control duties vacuum breakers may be used only to a limited degree. For such duties we recommend using the diaphragm-controlled vacuum control valve VV 33.

Standard

» VV 34 and 35 with spring cap and setting scale
» all stainless steel construction (CrNiMo steel)

Options

» VV 34 made of CrNiMo steel / steel
» special connections:
ANSI or JIS flanges, NPT, other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]								
nom. diam.	DN		20	25	32	40	50	65
	G..A	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
K_{vs}-value m^3/h		1.2	1.5	3.2	6	9	16	25

K_{vs}-Values [m^3/h]						
nom. diam. DN	80	100	125	150	200	250
K_{vs}-value m^3/h	41	70	107	169	266	388

Adjustable Differential Pressure Δp [bar]			
VV 34		VV 35	VV 36
≤ DN 100	≥ DN 125		
0.05-0.95	0.05-0.5	0.05-0.95	0.05-0.1

Pressure Control Valves

Vacuum Breakers and Vacuum Control Valves VV 34, 35, 36

Vacuum Breaker with Setting Scale

Materials	
Type	VV 34
Body	CrNiMo-steel optional CrNiMo-steel / Steel
Flange	CrNiMo-steel optional Steel
Spring Cap	CrNiMo-steel
Cone	CrNiMo-steel
Valve Seal	CrNiMo-steel

Materials	
Type	VV 35
Body	CrNiMo-steel
Spring Cap	CrNiMo-steel
Cone	CrNiMo-steel
Valve Seal	CrNiMo-steel

Materials	
Type	VV 36
Body	CrNiMo-steel
Cone	CrNiMo-steel
Valve Seal	CrNiMo-steel

Dimensions [mm] VV 34												
size	nominal diameter DN											
	20	25	32	40	50	65	80	100	125	150	200	250
A	250	280	350	350	380	530	600	650	700	860	1155	1390

Weights [kg] VV 34											
nominal diameter DN											
20	25	32	40	50	65	80	100	125	150	200	250
2	2.2	4.2	4.2	5.2	9.7	10.5	11.5	20	25	34	44

Dimensions [mm] VV 35						
size	nominal diameter G...A					
	3/4	1	1 1/4	1 1/2	2	2 1/2
A	250	280	350	350	380	530

Weights [kg] VV 35					
nominal diameter G...A					
3/4	1	1 1/4	1 1/2	2	2 1/2
1	1	1.8	2.3	2.5	6

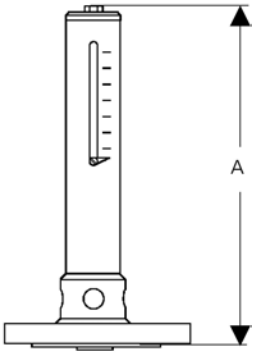
Dimensions [mm] VV 36							
size	nominal diameter G...A						
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
A	120	120	130	140	150	150	180

Weights [kg] VV 36						
nominal diameter G...A						
1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
0.5	0.6	0.8	1	1.2	1.5	2

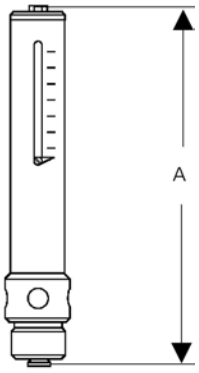
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

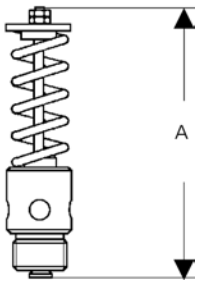
VV 34



VV 35



VV 36



Pressure Control Valves

Safety Valves

Normal or Full Lift Threaded Valve			SV 29
Spring-loaded normal safety valve | suitable for liquids, gases and steam | body made of 1.4104, 1.4404			
DN		G	
PN	40 - 400	p_1	0.1 - 330
T	200 °C		

Full Lift Threaded Valve			SV 29V
Spring-loaded full lift safety valve | suitable for liquids, gases and steam | body made of 1.4104, 1.4404			
G		PN	40 - 250
p_1	0.3 - 200 bar	T	200 °C

Normal and Proportional Valve			SV 4, 40
Spring-loaded, SV 4 with closed spring cap suitable for liquids and gases, SV 40 with open spring cap for steam / body made of GG-25, GS-C 25, CrNiMo steel			
DN	15 - 150	PN	16 - 40
p_1	0.2 - 40 bar	T	200 °C

Full Lift Safety Valve			SV 6, 60
Spring-loaded, SV 6 with closed spring cap suitable for liquids and gases, SV 60 with open spring cap for steam / body made of GG-25, GS-C 25, CrNiMo steel			
DN	25/40 - 150/250	PN	16 - 40
p_1	0.1 - 40 bar	T	200 °C

Know How Safety Valves

Safety valves are the ultimate protection device for tanks and pipelines. They prevent pressure limits being exceeded once all automatic control and monitoring equipment has failed.

Normal safety valves initially open proportionally up to a pressure rise of 10 %. This initial phase is followed by the full opening of the valve, allowing a large flow of medium. Especially in the case of liquids, the wide proportional range results in a continuous operation.
Pressure rise:
above 1 bar set pressure 10 % up to required valve lift;
below 1 bar set pressure 0.1 bar.

Proportional safety valves open almost continuously as the pressure rises. They produce the valve lift required for draining the volume within a maximum pressure rise of 10 %. They are used where only small volumes are expected to be drained (e.g. thermal expansion) and where the loss of medium is to be minimised.
Pressure rise:
above 1 bar set pressure 10 % up to required valve lift;
below 1 bar set pressure 0.1 bar.

Full lift safety valves open instantly up to maximum lift within a pressure rise of 5 %. Because of their instant opening they are used where suddenly larger flow volumes or fast pressure rises may occur. They are mainly used for relieving pressure in vapours and gases.
Pressure rise:
above 1 bar set pressure 5 % up to the max. valve lift;
below 1 bar set pressure 0.1 bar.

Closing pressure difference	
compressible media	**10 %**
below 3 bar	**0,3 bar**
non-compressible media	**20 %**
below 3 bar	**0,6 bar**

System operating pressure
The plant or system operating pressure should be at least 5 % below the safety valve closing pressure to ensure that the safety valve closes correctly.

Variable back pressure
During blow-off the variable back pressure created by blowing-off must not exceed 15 % of the valve operating pressure. If the variable back pressure is more than 15 % of the valve operating pressure, the valve capacity must be checked. For higher pressures safety valves fitted with pressure-compensating metal bellows should be used.

External back pressure
A constant external back pressure (caused by the system) can be compensated by selecting a suitable spring. In this case the above statements are not applicable.

Installation
Safety valves must always be installed with the spring cover at the top.

Safety valve inlet
The inlet spigots for safety valves should be as short as possible and must not produce a pressure drop exceeding 3 % of the valve operating pressure. If the pressure drop is greater, the inlet pipeline diameter should be increased. The edge of the inlet spigot should be chamfered or rounded.
Blow-off pipeline
For vapours or gases the blow-off pipeline should rise, whilst for liquids it should be installed with a fall. Please make sure that a blowing safety valve does not create a hazard, especially when a safety valve with open spring cover is installed.

Draining of condensate
To keep away dirt and foreign bodies from the safety valve, the blow-off line must have a condensate drain installed at its lowest point. In addition a drain orifice may be provided in the valve itself (this may be necessary for special operating environments such as ships). Before commissioning the valve the plastic plug inserted by the manufacturer must be replaced by a screwed plug.
Drain lines must have no constriction; they must have a fall away from the valve and an outlet which is open to view; the draining of the medium must not create a hazard. If the medium is steam the above requirement can be met by installing steam traps.

Leakage
Safety valves fitted with bellows feature a relief orifice in the spring cover. If medium leaks from this orifice, the bellows is faulty. In the case of toxic or hazardous media you must make sure that these are drained safely.

Insulation
If insulation is used it must not be applied to the spring cover or cooling area (if provided).

Maintenance
Safety valves must be cleaned and serviced at regular intervals. The service intervals depend on the ambient atmosphere (corrosive, dirty) and mode of operation (occasional, continual).

Function check
From time to time the valve should be checked for correct functioning either by manual venting or blowing off.
A slight leakage can be cured by blowing-off. If this does not stop the leak the sealing surfaces are probably damaged.
The valve should be closed by a sudden release of the venting lever. After testing the lever must no longer be engaged with the coupling. To disengage the lever it should be pushed towards the centre of the spring cover until the venting fork is free.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, 0perating instruction etc. MUST be followed.

Selection Safety Valves

for steam and gases

PN*	set pressure** bar	T*** °C	connection		notes	type
			G	DN		
16 - 40	0.2 - 40	450		20 - 400	full lift safety valve	6
16 - 40	0.2 - 40	450		20 - 400	full lift safety valve for steam with open bonnet	60
63 - 400	2.5 - 300	550		25 - 100	high pressure full lift safety valve	46
63 - 400	2.5 - 300	550		25 - 100	high pressure full lift safety valve for steam with open bonnet	47
16 - 40	1 - 40	450		25 - 100	full lift safety valve, weight loaded	3
-	0.2 - 630	300	3/4 - 1		full lift safety valve, screwed	29V
16 - 160	0.2 - 40	450		15 - 150	normal safety valve	4
16 - 160	0.2 - 40	450		15 - 150	normal safety valve for steam with open bonnet	40
16 - 40	0.5 - 40	450		20 - 150	normal safety valve, weight loaded	1
-	0.3 - 160	300	1/2 - 1 1/4		normal safety valve, screwed	29
16 - 40	0.2 - 40	450		15 - 150	proportional safety valve	4
16 - 40	0.2 - 40	450		15 - 150	proportional safety valve for steam with open bonnet	40
16 - 40	0.5 - 40	400		15 - 150	globe proportional safety valve	7

for liquids

PN*	set pressure** bar	T*** °C	connection		notes	type
			G	DN		
16 - 40	0.2 - 40	450		20 - 400	full lift safety valve	6
63 - 400	2.5 - 300	550		25 - 100	high pressure full lift safety valve	46
-	0.2 - 630	300	3/4 - 1		full lift safety valve, screwed	29V
16 - 160	0.2 - 40	450		15 - 150	normal safety valve	4
-	0.3 - 160	300	1/2 - 1 1/4		normal safety valve, screwed	29
16 - 40	0.2 - 40	450		15 - 150	proportional safety valve	4
16 - 40	0.5 - 40	400		15 - 150	globe proportional safety valve	7

* The stated PN are not valid for all body sizes DN
** The stated set pressures are not valid for all body sizes DN and media
*** Standard design up to 200 °C, higher temperatures on request.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pressure Control Valves

Safety Valves SV 29

Normal or Full Lift Threaded Valve

Technical Data

Connection DN	15 - 25
Connection G	G 3/8A - 1A
Nominal Pressure PN	40 - 400
Set Pressure	0.1 - 330
Temperature	200 °C
Medium	liquids, gases and steam

Description

Safety valves are the ultimate protection device for tanks and pipelines. They prevent pressure limits being exceeded once all automatic control and monitoring equipment has failed.

SV 29 is a spring-loaded normal safety valve with threaded connection and closed spring cap. Component testing for connection sizes G 1/2 and G 3/4 for steam and gases up to 150 bar and liquids up to 40 bar.

Normal safety valves initially open proportionally up to a pressure rise of 10 %. This initial phase is followed by the full opening of the valve, allowing a large flow of medium.
Especially in the case of liquids, the wide proportional range results in a continuous operation.
Pressure rise:
above 1 bar set pressure: .....10 % up to required valve lift;
below 1 bar set pressure: .....0.1 bar.

Options

» Sonderanschlüsse: ANSI-Flansche, NPT, andere Anschlüsse auf Anfrage
» Sonderabmessungen auf Anfrage

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Available Versions	
H2	without lifting device, gastight cap
H4	with lifting device, gastight cap

kombinierbare Gehäusevarianten				
Austrittsgehäuse				
G	1/2	3/4	1	
DN	15	20	25	
Eintrittskörper				
G	G 3/8A	G 1/2A	G 3/4A	G 1A
DN	15	20	25	

Pressure Control Valves

Safety Valves SV 29

Normal or Full Lift Threaded Valve

Materials			
1	Body (Base)	1.4104	1.4404
9	Bonnet	0.7043	1.4404
12	Spindle	1.4021	1.4404
17	Spring Plate	1.4104	1.4404
18	Adjusting Screw	1.4104	1.4404
54	Spring	1.4310	1.4310

*Nur gültig für Anschlussgrößen G 3/8, G 1/2, G 3/4

Dimensions [mm] and Weights [kg]		
G inlet	1/2 A	3/4 A
G outlet	1/2	1/2
do	10	12,5
A	33	33
B	33	33
C (H2) *	132	132
C (H4) *	147	147
E	150	150
F	15	16
weight	0.8	0.8

Gewichte [kg] Zapfenanschluss			
G 1/8	G 1/2	G 3/4	G 1
1,2	1,2	1,6	1,6

Abmessungen [mm] Flanschanschluss				
PN	Maß	Nennweite DN		
		15	20	25
40	A	100	100	100
	B	100	100	100
	C	263	263	263
160	A	100	100	100
	B	103	103	103
	C	287	287	287

Andere Druckstufen auf Anfrage. Bei bestimmten Kombinatinen aus der Nennweite und der Flanschdruckstufe bei ein- und austrittsseitig verwendeten Flanschanschlüssen kann es zu abweichenden Austrittsmaßen A kommen. Sondermaße sind möglich.

Gewichte [kg] Flanschanschluss	
Für die Berechnung des Gesamtgewichtes verwenden Sie bitte folgende Formel: $m_N + m_F$ (Eintritt) + m_F (Austritt)	
Nettogewicht m_N [kg] (ohne Eintritts- und Austrittsflansch)	2,4

Flanschmaße D [mm] und Gewichte mF [kg]				
PN	Maß	Nennweite DN		
		15	20	25
40	D	18	20	22
	m_F	0,8	1,1	1,3
100	D	-	22	-
	m_F	-	1,3	-
160	D	22	-	26
	m_F	1,2	-	2,6
250	D	28	-	30
	m_F	2,5	-	3,5
320	D	28	-	36
	m_F	2,5	-	5
400	D	30	-	40
	m_F	3,6	-	7,5

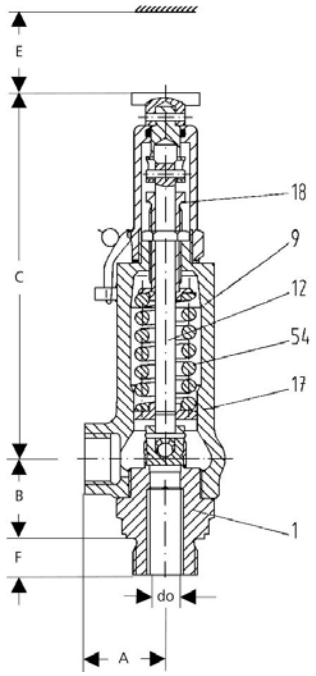
Special designs on request.
The pressure has always been indicated as overpressure.

Pressure Control Valves

Safety Valves SV 29

Normal or Full Lift Threaded Valve

Dimensional Drawing



Pressure Control Valves

Safety Valves SV 29

Normal or Full Lift Threaded Valve

Flow Rate				
seat [mm]	set pressure [bar]	D	L	W
do = 10	0.5	29	34	1080
	1	43	51	1500
	2	70	84	2100
	3	94	115	2500
	4	118	145	2900
	5	141	174	3300
	6	164	204	3600
	8	209	262	4100
	10	255	321	4600
	16	392	498	5900
	20	483	615	6600
	26	619	792	7500
	30	712	909	8000
	40	943	1204	9300
	50	1181	1498	10400
	60	1421	1792	11400
	70	1670	2086	12300
	80	1921	2380	13100
	100	2451	2969	14700
	150	4044	4439	18000
do = 6	190	-	2911	-
	200	-	3064	-
	250	-	3826	-
	300	-	4589	-
	330	-	5046	-

D = saturated steam [kg/h] L = air [m^3/h] W = water [kg/h]

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pressure Control Valves

Safety Valves SV 29V

Full Lift Threaded Valve

Technical Data

Connection G	1/2 - 1 1/2
Nominal Pressure PN	40 - 250
Set Pressure	0.3 - 200 bar
Temperature	200 °C
Medium	liquids, gases, steam

Description

Safety valves are the ultimate protection device for tanks and pipelines. They prevent pressure limits being exceeded once all automatic control and monitoring equipment has failed.

SV29V is a spring-loaded full-stroke safety valve with tested components provided with threaded connection and closed spring cap.

Full lift safety valves open instantly up to maximum lift within a pressure rise of 5 %. Because of their instant opening they are used where suddenly larger flow volumes or fast pressure
rises may occur. They are mainly used for relieving pressure in vapours and gases.
Pressure rise:
above 1 bar set pressure:.....5 % up to the max. valve lift;
below 1 bar set pressure: .....0.1 bar.

Options

» special version up to 300 °C

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Available Versions	
H2	without lifting device, gastight cap
H3	with lifting device, not gastight
H4	with lifting device, gastight cap

Lieferbare Anschlussgrößen G					
d_o [mm]	Nennweite (Eintritt / Austritt) G				
9	1/2 x 1	3/4 x 1	1 x 1	-	-
13	1/2 x 1	3/4 x 1	1 x 1	-	-
17,5	-	3/4 x 1 1/2	1 x 1 1/2	1 1/4 x 1 1/2	1 1/2 x 1 1/2

Pressure Control Valves

Safety Valves SV 29V

Full Lift Threaded Valve

Materials		
Body (Base)	1.4104	1.4404
Outlet Body	0.7043	1.4404
Guide	1.4104 tenifer	1.4404
Bonnet	0.7043	1.4404
Spindle	1.4021	1.4404
Spring Plate	1.0718	1.4404
Adjusting Screw with Bush	1.4104 with PTFE	1.4404 tenifer with PTFE
Spring	spring steel C	1.4310

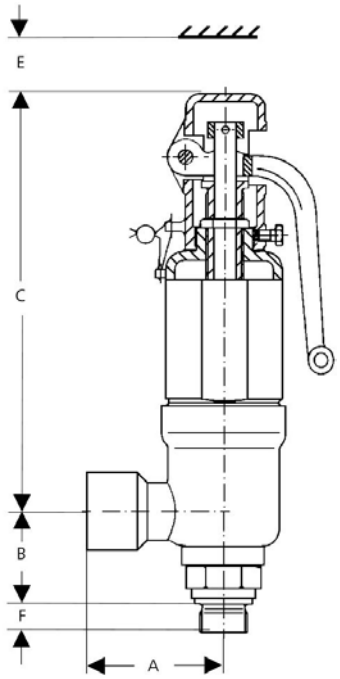
Dimensions [mm] + Weights [kg]			
G inlet	3/4 A	3/4 A	1 A
G outlet	1	1	1 1/2
do	9	13	17,5
A	75	75	75
B	50	50	54
C (H2) *	228	228	225
C (H3) *	228	228	225
C (H4) *	230	230	227
E	150	150	150
F	16	16	18
weight	2,6	2,6	3

*H2 = without lifting device, gastight cap
*H3 = with lifting device, not gastight
*H4 = with lifting device, gastight cap

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

Dimensional Drawing



Pressure Control Valves

Safety Valves SV 29V

Full Lift Threaded Valve

Seat Diameter		
inlet	G 3/4A	G 1A
outlet	G 1	G 1 1/2
seat ø	9 mm, 13 mm	17.5 mm

Flow Rate

set pressure [bar]	saturated steam[kg/h]			air [Nm³/h]			water [m³/h]		
	9 mm	13 mm	17.5 mm	9 mm	13 mm	17.5 mm	9 mm	13 mm	17.5 mm
0,2	-	53	85	-	61	98	-	1.96	3.48
0,5	-	84	134	-	98	157	-	2.77	4.93
1	-	120	200	-	143	238	-	3.75	6.67
2	93	190	331	113	229	400	2.93	5.31	9.44
3	127	258	456	155	316	558	3.59	6.50	11.60
4	158	322	569	195	396	700	4.14	7.51	13.30
5	189	386	681	234	477	842	4.63	8.39	14.90
6	220	449	793	247	557	985	5.07	9.19	16.30
8	282	573	1013	353	718	1269	5.86	10.60	18.90
10	343	699	1235	432	879	1554	6.55	11.90	21.10
16	527	1027	1895	669	1363	2408	8.28	15.00	26.70
20	650	1323	2338	827	1685	2977	9.26	16.80	29.80
26	833	1696	2997	1065	2168	3831	10.60	19.10	34.00
30	957	1949	3445	1223	2490	4401	11.30	20.60	36.50
40	1268	2582	4564	1618	3295	5824	13.10	23.70	42.20
50	1588	3234	5715	2014	4101	7247	14.60	26.50	47.20
60	1910	3889	8079	2409	4906	8671	16.00	29.10	51.70
80	2583	5259	9294	3201	6517	11518	18.50	33.60	59.70
100	3296	6711	11862	3992	8127	14364	20.70	37.50	66.70
160	5977	12171	-	6365	23959	-	26.2	47.5	-
200	8989	18303	-	7947	16181	-	29.30	53.10	-

Special designs on request.
The pressure has always been indicated as overpressure.

Pressure Control Valves

Safety Valves SV 4, 40

Normal and Proportional Valve

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Set Pressure	0.2 - 40 bar
Temperature	200 °C
Medium	liquids, gases, steam

Description

Safety valves are the ultimate protection device for tanks and pipelines. They prevent pressure limits being exceeded once all automatic control and monitoring equipment has failed.

SV and SV 40 are spring-loaded normal and proportional safety valves with tested components and provided with flanged connection. SV 4 features a closed spring cap, SV 40 is provided with an open spring cap for better cooling of the spring.

Normal safety valves initially open proportionally up to a pressure rise of 10 %. This initial phase is followed by the full opening of the valve, allowing a large flow of medium.
Especially in the case of liquids, the wide proportional range results in a continuous operation.
Pressure rise:
above 1 bar set pressure: .....10 % up to required valve lift;
below 1 bar set pressure: .....0.1 bar.

Proportional safety valves open almost continuously as the pressure rises. They produce the valve lift required for draining the volume within a maximum pressure rise of 10 %. They are used where only small volumes are expected to be drained (e.g. thermal expansion) and where the loss of medium is to be minimised.
Pressure rise:
above 1 bar set pressure:.....10 % up to required valve lift;
below 1 bar set pressure:.....0.1 bar.

Options

» special version up to 300 °C

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Available Versions	
H2	without lifting device, gastight cap
H3	with lifting device, not gastight
H4	with lifting device, gastight cap

Pressure Control Valves

Safety Valves SV 4, 40

Normal and Proportional Valve

Materials			
1	Body		GG-25 / GGG-40 / GS-C 25
5	Seat		1.4571 / 1.4404
7	Cone		1.4122
8	Guide		1.4104 / 1.0501 / 0.7040
9	Bonnet		0.7040 (0.7043 / 1.0619)
12	Spindle		1.4021
16	Spring Plate		1.0718 / 1.4404
18	Adjusting Screw		1.4104 with PTFE-bush
54	Spring	up to 200 °C	1.1200 / 1.7102 / 1.8159 / 1.4310
		from 200 °C	1.7102 / 1.8159 / 1.4310

Materials Stainless Steel Design			
1	Body		1.4408
5	Seat		1.4571 / 1.4404
7	Cone		1.4404
8	Guide		1.4404
9	Bonnet		1.4408
12	Spindle		1.4404
16	Spring Plate		1.4404
18	Adjusting Screw		1.4404 with PTFE-bush
54	Spring	up to 200 °C	1.4310
		from 200 °C	1.4310

Dimensions [mm]											
DN inlet	15	20	25	32	40	50	65	80	100	125	150
DN outlet	15	20	25	32	40	50	65	80	100	125	150
do	12	18	18	18	23	29	37	46	60	74	92
A_1	90	95	100	105	115	125	145	155	175	200	225
B_1	90	95	100	105	115	125	145	155	175	200	225
C (H2)*	218	218	218	218	218	233	315	360	400	500	600
C (H3)*	220	220	220	220	220	235	325	370	430	545	645
C (H4)*	215	215	215	215	215	230	330	375	435	540	640
E	150	150	150	200	200	250	250	300	350	400	450

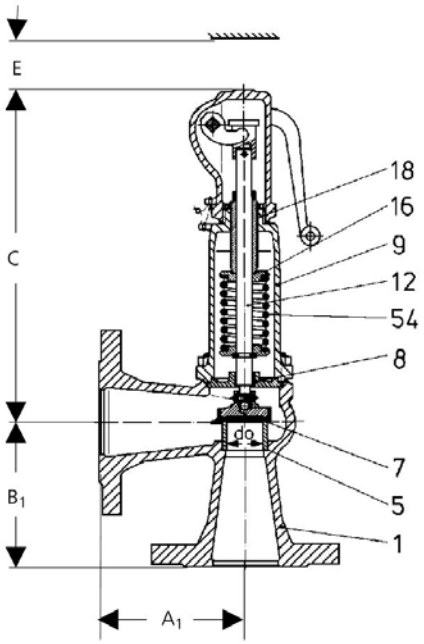
*H2 = without lifting device, gastight cap
*H3 = with lifting device, not gastight
*H4 = with lifting device, gastight cap

Dimensions for stainless steel design on request.

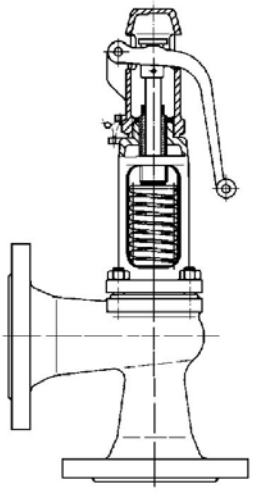
Weights [kg]										
nominal diameter DN										
15	20	25	32	40	50	65	80	100	125	150
5	6	6	8	9	12	15	20	33	48	65

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

SV 4



SV 40



Pressure Control Valves

Safety Valves SV 4, 40

Normal and Proportional Valve

Flow Rate													
type	medium	set pressure[bar]	flange connection - nominal diameter DN										
			15	20	25	32	40	50	65	80	100	125	150
4 40	saturated steam [kg/h]	0.5	55	30	63	63	102	163	265	410	697	1060	1638
		1	78	67	101	101	165	263	428	661	1125	1711	2645
		2	125	129	170	170	278	442	720	1113	1893	2880	4452
		3	168	177	232	232	379	603	981	1517	2581	3926	6068
		4	201	221	290	290	473	752	1224	1892	3218	4895	7567
		5	251	265	347	347	566	900	1465	2265	3853	5861	9058
		6	293	308	404	404	659	1048	1706	2636	4485	6823	10545
		7	333	350	457	457	750	1192	1940	2999	5102	7761	11996
		8	374	394	516	516	842	1339	2179	3368	5730	8717	13473
		9	415	437	572	572	934	1485	2418	3737	6358	9617	14948
		10	456	480	629	629	1026	1632	2656	4105	6984	10629	16421
		12	538	566	741	741	1210	1924	3132	4842	8237	12530	19366
		14	618	650	852	852	1391	2211	3599	5563	9641	14355	22250
		16	699	736	964	964	1574	2503	4074	6297	10714	16296	25189
		18	781	822	1077	1077	1758	2795	4550	7083	11965	18200	28131
		24	1024	1078	1412	1412	2306	3665	5967	9222	15690	23966	-
		28	1189	1251	1639	1639	2676	4254	6925	10704	18211	-	-
		32	1354	1425	1867	1867	3049	4847	7890	12195	20748	-	-
	air [Nm³/h]	0.5	67	35	74	74	120	191	311	481	819	1245	1925
		1	93	80	121	121	197	313	510	788	1341	2039	3152
		2	151	156	206	206	336	534	870	1344	2287	3478	5377
		3	206	217	284	284	463	737	1199	1854	3153	4797	7414
		4	258	272	356	356	582	925	1505	2327	3958	6021	9306
		5	311	327	429	429	700	1113	1811	2800	4763	7245	11198
		6	363	382	501	501	818	1301	2117	3273	5568	8469	13091
		7	416	438	574	574	936	1489	2423	3746	6378	9694	14983
		8	468	493	646	646	1055	1677	2729	4219	7177	10918	16875
		9	521	548	718	718	1173	1865	3085	4692	7982	12142	18767
		10	573	604	791	791	1291	2053	3342	5165	8787	13366	20659
		12	679	714	936	936	1528	2429	3954	6111	10397	15815	24444
		14	784	825	1081	1081	1764	2805	4566	7057	12006	18263	28228
		16	889	935	1225	1225	2001	3181	5178	8003	13616	20711	32013
		18	994	1046	1370	1370	2237	3557	5790	8949	15226	23160	-
		22	1204	1267	1660	1660	2710	4309	7014	10842	18445	28057	-
		24	1309	1377	1805	1805	2947	4685	7626	11788	20055	30505	-
		32	1729	1820	2384	2384	3893	6189	10075	15572	-	-	-
		36	1939	2041	2674	2674	4366	6941	11299	-	-	-	-
		40	2149	2262	2964	2964	4839	7693	12523	-	-	-	-
4	water [m³/h]	0.5	2.14	1.9	2.51	2.51	4.09	6.51	10.6	16.4	27.8	42.4	65.5
		1	2.9	2.58	3.39	3.39	5.54	8.81	14.3	22.2	37.7	57.4	88.7
		2	4.1	3.65	4.8	4.8	7.84	12.5	20.3	31.3	53.3	81.1	125
		3	5.02	4.47	5.88	5.88	9.6	15.3	24.8	38.4	65.3	99.3	154
		4	5.79	5.16	6.79	6.79	11.1	17.6	28.7	44.3	75.4	115	177
		5	6.48	5.77	7.59	7.59	12.4	19.7	32.1	49.6	84.3	128	198
		6	7.09	6.32	8.31	8.31	13.6	21.6	35.1	54.3	92.4	140	217
		7	7.66	6.82	8.98	8.98	14.7	23.3	37.9	58.6	99.8	152	235
		8	8.19	7.3	9.6	9.6	15.7	24.9	40.6	62.7	107	162	251
		9	8.69	7.74	10.2	10.2	16.6	26.4	43.0	66.5	113	172	266
		10	9.16	8.16	10.7	10.7	17.5	27.9	45.3	70.1	119	181	280
		12	10.0	8.93	11.8	11.8	19.2	30.5	49.7	76.8	131	199	307
		14	10.8	9.65	12.7	12.7	20.7	33.0	53.7	82.9	141	215	332
		16	11.6	10.3	13.6	13.6	22.2	35.2	57.4	88.7	151	229	355
		22	13.6	12.1	15.9	15.9	26.0	41.3	67.3	104	177	269	-
		28	15.3	13.0	18.0	29.3	46.6	75.9	117	200	304	-	
		32	16.4	14.6	19.2	19.2	31.3	49.8	81.1	125	-	-	-
		36	17.4	15.5	20.4	20.4	33.2	52.9	86	-	-	-	-
		40	18.3	16.3	21.5	21.5	35.0	55.7	90.7	-	-	-	-

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pressure Control Valves

Safety Valves SV 6, 60

Full Lift Safety Valve

Technical Data

Connection DN	25/40 - 150/250
Nominal Pressure PN	16 - 40
Set Pressure	0.1 - 40 bar
Temperature	200 °C
Medium	liquids, gases, steam

Description

Safety valves are the ultimate protection device for tanks and pipelines. They prevent pressure limits being exceeded once all automatic control and monitoring equipment has failed.

SV 6 and SV 60 are spring-loaded full-stroke safety valves with tested components provided with flanged connection. SV 6 features a closed spring cap, SV 60 is provided with an open spring cap for better cooling of the spring.

Full lift safety valves open instantly up to maximum lift within a pressure rise of 5 %. Because of their instant opening they are used where suddenly larger flow volumes or fast pressure
rises may occur. They are mainly used for relieving pressure in vapours and gases.
Pressure rise:
above 1 bar set pressure:.....5 % up to the max. valve lift;
below 1 bar set pressure: .....0.1 bar.

Options

» special version up to 300 °C

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Available Versions	
H2	without lifting device, gastight cap
H3	with lifting device, not gastight
H4	with lifting device, gastight cap

Pressure Control Valves

Safety Valves SV 6, 60

Full Lift Safety Valve

Materials			
1	Body		GG-25 / GS-C 25 / 1.4408
5	Seat		1.4404
7	Cone		1.4122 / 1.4404
8	Guide		0.7040 / 1.0501 / 1.4104 / 1.4404
9	Bonnet		0.7040 (0.7043 / 1.0619) / 1.4408 / 1.4571
12	Spindle		1.4021 / 1.4404
16	Spring Plate		1.0718 / 1.4404
18	Adjusting Screw		1.4404 / 1.4104 with PTFE-bush
54	Spring	up to 200 °C	1.1200 / 1.7102 / 1.8159 / 1.4310
		from 200 °C	1.7102 / 1.8159 / 1.4310

Dimensions [mm]										
DN inlet	20	25	32	40	50	65	80	100	125	150
DN outlet	40	40	50	65	80	100	125	150	200	250
do	18	23	29	37	46	60	74	92	98	125
A_1	95	100	110	115	120	140	160	180	200	225
B_1	85	105	115	140	150	170	195	220	250	285
C (H2)*	217	232	315	356	403	481	558	615	615	735
C (H3)*	218	233	325	366	413	526	603	660	660	735
C (H4)*	219	234	331	372	419	529	606	663	663	735
E	150	150	200	250	300	350	400	450	450	450

*H2 = without lifting device, gastight cap
*H3 = with lifting device, not gastight
*H4 = with lifting device, gastight cap

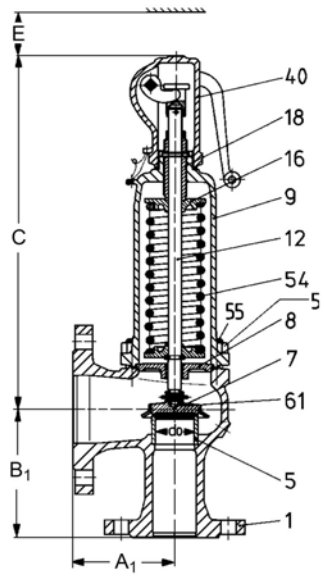
Dimensions for stainless steel design on request.

Weights [kg]									
nominal diameter DN									
20	25	32	40	50	65	80	100	125	150
9	9	12	16	22	32	56	75	85	131

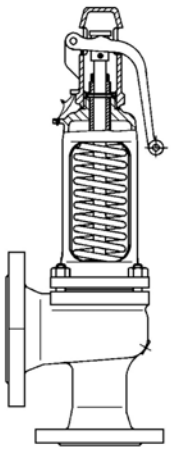
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

SV 6



SV 60



Pressure Control Valves

Safety Valves SV 6, 60

Full Lift Safety Valve

Durchsatz

type	medium	set pressure	flange connection - nominal diameter DN								
			25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
6 60	saturated steam[kg/h]	0,5	224	356	579	895	1523	2316	3580	4062	6609
		1	326	518	843	1302	2215	3370	5209	5910	9616
		2	519	825	1343	2075	3531	5371	8302	9420	15326
		3	699	1111	1808	2794	4754	7232	11178	12683	20635
		4	871	1385	2254	3485	5928	9018	13538	15816	25731
		5	1043	1658	2699	4172	7097	10796	16687	18934	30804
		6	1214	1930	3142	4856	8262	12568	19426	22042	35861
		7	1381	2196	3574	5525	9399	14297	22098	25074	40794
		8	1551	2486	4014	6205	10556	16052	24818	28461	45816
		9	1721	2736	4454	6884	11712	12815	27535	31244	50831
		10	1891	3006	4893	7562	12866	19571	30250	34324	55842
		12	2230	3545	5770	8919	15174	23081	35675	40480	65858
		14	2562	4073	6629	10247	17433	26518	40587	46507	75664
		16	2900	4610	7505	12600	19735	30020	46400	52050	85657
		18	3239	5149	8382	12955	22041	33526	51820	58800	95663
		24	4247	6752	10991	16988	28903	43964	67953	77106	125445
		28	4930	7837	12757	19718	33547	51029	78873	189496	-
		32	5616	8929	14534	22465	38220	58137	89860	-	-
	air [Nm³/h]	0,5	263	418	680	1051	1789	2721	4206	4772	7764
		1	388	617	1004	1552	2641	4017	6209	7045	11461
		2	627	996	1622	2507	4265	6487	10026	11377	18509
		3	854	1357	2209	3414	5809	8836	13657	15497	25212
		4	1071	1703	2773	4286	7291	11091	17143	19452	31647
		5	1289	2050	3337	5157	8774	13346	20629	23407	38082
		6	1507	2396	3900	6029	10257	15601	24114	27362	44516
		7	1725	2742	4464	6900	12739	17857	27600	31317	50951
		8	1943	3089	5028	7771	13222	20112	31086	35273	57386
		9	2161	3435	5592	8643	14704	22367	34571	39228	63821
		10	2379	3781	6155	9514	16187	24622	38057	43183	70255
		12	2814	4474	7283	11257	19152	29132	45028	51093	83125
		14	3250	5167	8411	13000	22117	33642	52000	59003	95994
		16	3686	5859	9538	14743	25082	38153	58971	66914	108863
		18	4121	6552	10666	16486	28047	42663	65942	74824	121733
		22	4993	7938	12921	19971	33577	51683	75385	90644	147472
		24	5429	8630	14048	25714	36943	56194	86856	98555	160341
		32	7171	11401	18559	28685	48803	74851	114741	-	-
		36	8043	12786	20814	32171	54733	83255	128684	-	-
		40	8914	14172	23069	35657	60663	92276	14626	-	-
6	water [m³/h]	0.5	7.37	11.7	19.1	29.5	50.1	76.3	118	134	218
		1	9.97	15.	25.8	39.9	67.9	103	160	181	295
		2	14.1	22.4	36.5	56.4	96,0	146	226	256	417
		3	17.3	27.5	44.7	69.1	118	179	276	314	510
		4	19.9	31.7	51.6	79.8	136	206	319	362	589
		5	22.3	35.5	57.7	89.2	152	231	357	405	659
		6	24.4	38.8	63.2	97.7	166	253	391	444	722
		7	26.4	42.0	68.3	106	180	273	422	479	779
		8	28.2	44.8	73.0	113	192	292	451	512	833
		9	29.9	47.6	77.4	120	204	310	479	543	884
		10	31.5	50.1	81.6	126	215	326	505	573	932
		12	34.6	54.9	89.4	138	235	358	553	627	1021
		14	37.3	59.3	96.6	149	254	386	597	678	1102
		16	39.9	63.4	103	160	272	413	638	724	1178
		22	46.8	74.4	121	187	318	484	748	849	1382
		28	52.8	83.9	137	211	359	546	844	-	-
		32	56.4	89.7	146	226	384	584	903	-	-
		36	59.8	95.1	155	239	407	619	957	-	-
		40	63.1	100	163	252	429	653	1009	-	-

Pressure Control Valves

Pilot-operated Control Valves

Pilot-operated pressure reducing valve			RP 115
Pilot-operated pressure reducing valve for high flow rates | specially developed for drinking water Applications | body made of GGG-40 Epoxy coated, meets the KTW recommendation of the German Ministry for Health | adjustable closing, opening and response speed			
DN	50 - 400	PN	16
p_1	up to 16 bar	p_2	1.5 - 15 bar
K_{vs}	40 - 1400 m^3/h	T	70 °C

Pilot-operated Backpressure Regulator			RP 116
Pilot-operated backpressure regulator for high flow rates | specially developed for drinking water Applications | body made of GGG-40 Epoxy coated, meets the KTW recommendation of the German Ministry for Health | adjustable closing, opening and response speed			
DN	50 - 400	PN	16
p_1	1,5 - 15 bar	K_{vs}	45 - 1400 m^3/h
T	70 °C		

Pilot-operated Pressure Reducing Valve			RP 810
single-seat straight-way valve made of cast steel for large flow rates at high pressure | usable for liquids and gas | body made of GGG-40, GS-C 25, CrNiMo-steel | hardfaced valve cone and seat available for high pressure drops | maintenance work can be done from above at the installed valve, special versions available			
DN	40 - 400	PN	16 - 160
p_2	1 - 40 bar	K_{vs}	20 - 900 m^3/h
T	130 °C		

Pilot-operated Pressure Reducing Valve			RP 810 Eck
single-seat, angled design suitable for high flow rates and high pressures | usable for liquids | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex or Hastelloy® available | NACE-compatible | pilot valve and throttle block with integrated strainer and throttle valves completely of CrNiMo-steel | hardfaced valve cone and seat available for high pressure drops | special version with damping for gas applications available			
DN	40 - 150	PN	16 - 160
p_1	up to 160 bar	p_2	1 - 40 bar
K_{vs}	20 - 70 m^3/h	T	130 °C

Pilot-operated Pressure Reducing Valve			RP 814, 815
Pressure reducing valve of the inline design in welded construction for large flow rates | RP 815 with extended casing for maximum Kvs-values, high pressure at large flow rates | body made of welded steel, CrNiMo steel | special versions available			
DN	100 - 800	PN	16 - 25
p_2	1 - 20 bar	K_{vs}	60 - 2100 m^3/h
T	130 °C		

Pressure Control Valves

Pilot-operated Control Valves

Pilot-operated Backpressure Regulator			RP 820
single-seat straight-way valve made of cast steel for large flow rates at high pressure | usable for liquids | body made of GGG-40, GS-C 25, CrNiMo-steel | maintenance work can be done from above at the installed valve, special versions available			
DN	40 - 400	PN	10 - 63
p_1	2 - 40 bar	K_{vs}	20 - 900 m^3/h
T	130 °C		

Pilot-operated Backpressure Regulator			RP 820 Eck
single-seat, angled design suitable for high flow rates and high pressures | usable for liquids | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex or Hastelloy® available | NACE-compatible | pilot valve and throttle block with integrated strainer and throttle valves completely of CrNiMo-steel | hardfaced valve cone and seat available for high pressure drops | special version with damping for gas applications available			
DN	40 - 150	PN	10 - 100
p_1	2 - 63 bar	p_{min}	minimum 2 bar
p_2	up to 61 bar	K_{vs}	20 - 250 m^3/h
T	130 °C		

Pilot-operated Backpressure Regulator			RP 824, 825
Pressure reducing valve of the inline design in welded construction for large flow rates | RP 825 with extended casing for maximum Kvs-values, high pressure at large flow rates | body made of welded steel, CrNiMo steel | special versions available			
DN	100 - 800	PN	10 - 25
p_1	2 - 20 bar	K_{vs}	60 - 2100 m^3/h
T	130 °C		

Pilot-operated Millibar Control Valve			RP 840
pilot-operated pressure reducing valves consisting of a main valve for large flow rates, combined with a High Grade millibar valve acting as pilot valve | available as prefabricated unit in a rack			
DN	25 - 150	PN	16
p_2	0.002 - 0.52 bar	K_{vs}	4 - 160 m^3/h
T	130 °C		

Pressure Control Valves

Pilot-operated Control Valves RP 115

Pilot-operated pressure reducing valve

Technical Data

Connection DN	50 - 400
Nominal Pressure PN	16
Inlet Pressure	up to 16 bar
Outlet Pressure	1.5 - 15 bar
K_{vs}-Value	40 - 1400 m^3/h
Temperature	70 °C
Medium	water

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The RP 115 pressure reducing valve is a pilot-controlled control valve consisting of main valve with position indicator, control unit, pilot valve, pressure gauge, stop valves and connecting pipes. The main valve cone is fitted with a soft seal. This valve which has been specially developed for drinking water applications, features an electrostatically deposited coating on internal and external surfaces and meets the KTW recommendation of the German Ministry for Health.

When the pipeline is depressurised or inlet and outlet pressures are equal, the main valve is kept closed by its spring.

When the outlet pressure falls below the set pressure the control medium can flow towards the valve outlet via the open pilot valve. A restrictor in the control unit produces a pressure drop upstream of the diaphragm causing the inlet pressure to overcome the control pressure and spring force and open the main valve.

As soon as the outlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve cone into a controlling position.

When the outlet pressure exceeds the set pressure the pilot valve closes. The pilot pressure continues to rise and the main valve also closes.

The pressure difference between inlet pressure and outlet pressure must be at least 0,5 bar!

The control unit contains adjustable restrictors which allow the control characteristics of the pressure reducer to be matched to the system (closing, opening and response speeds).

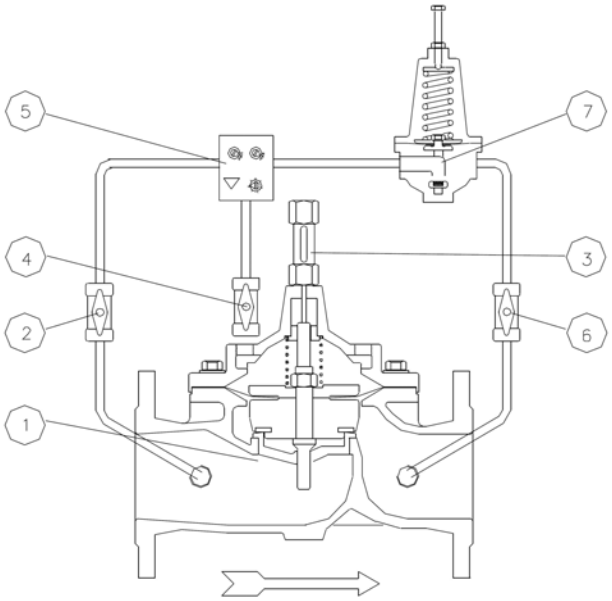
The pressure reducer is completely piped. It does not require any additional pilot lines.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Options

- set pressure range 1 - 7 bar
- nominal diameter ≥ DN 500
- rated pressure level PN 10, PN 25
- special versdions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



1 main valve
2 shut off valve
3 vane relay
4 shut off valve
5 control unit
6 shut off valve
7 pilot valve

K_{vs}-values [m^3/h]					
nominal diameter DN	50	65	80	100	125
K_{vs}-value m^3/h	40	60	95	150	160

K_{vs}-values [m^3/h]					
nominal diameter DN	150	200	250	300	400
K_{vs}-value m^3/h	350	600	950	1300	1400

Pressure Control Valves

Pilot-operated Control Valves RP 115

Pilot-operated pressure reducing valve

Materials - Main Valve	
Temperature	70 °C
Body	spherodial cast iron Epoxy-coated*
Cover	spherodial cast iron Epoxy-coated*
Internals	stainless steel, bronze, spherodial cast iron Epoxy-coated*
Spring	stainless steel
Valve Seal	NBR
O-Ring	NBR
Diaphragm	NBR-Nylon-reinforced*
Screws	stainless steel

Materials - Pilot Circuit	
Control Unit	stainless steel
Pilot Valve	bronze, internals made of stainless steel, diaphragm made of NBR
Filter Seeve	1.4404
Sense Line	stainless steel
Fittings	brass
Shut-off Valves	brass, nickel plated

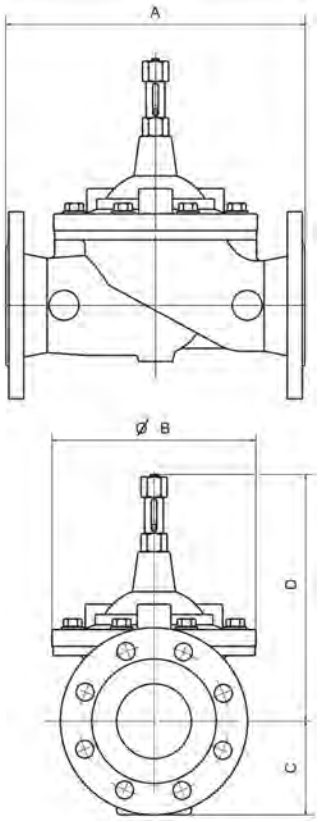
* in accordance with KTW-recommendation

Dimensions [mm] and Weights[kg]					
size	nominal diameter DN				
	50	65	80	100	125
A	230	290	310	350	400
B	162	194	218	260	304
C	83	93	100	118	135
D	233	255	274	316	383
kg	18	23,5	28	39	47

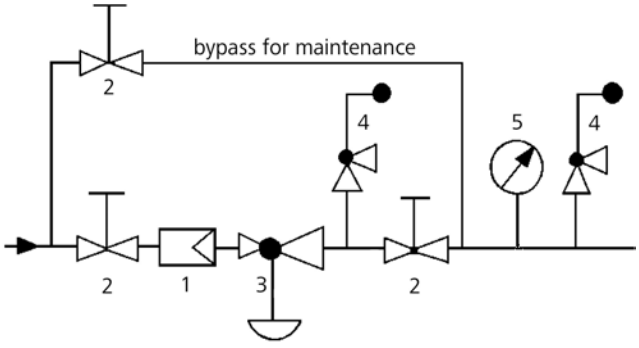
Dimensions [mm] and Weights [kg]					
size	nominal diameter DN				
	150	200	250	300	400
A	480	600	730	850	1100
B	370	454	570	710	710
C	150	180	213	242	310
D	431	523	620	670	709
kg	84	138	264	405	560

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Shut off valve
5 Manometer

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Pressure Control Valves

Pilot-operated Control Valves RP 116

Pilot-operated Backpressure Regulator

Technical Data

Connection DN	50 - 400
Nominal Pressure PN	16
Inlet Pressure	1,5 - 15 bar
K_{vs}-Value	45 - 1400 m^3/h
Temperature	70 °C
Medium	water

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The RP 116 overflow valve is a pilot-controlled control valve consisting of main valve with position indicator, control unit, pilot valve, pressure gauge, stop valves and connecting pipes. The main valve cone is fitted with a soft seal. This valve which has been specially developed for drinking water applications, features an electrostatically deposited coating on internal and external surfaces and meets the KTW recommendation of the German Ministry for Health.

When the pipeline is depressurised or inlet and outlet pressures are equal, the main valve is kept closed by its spring.

When the inlet pressure rises above the set pressure the control medium flows towards the valve outlet via the open pilot valve. A restrictor in the control unit produces a pressure drop upstream of the diaphragm causing the inlet pressure to overcome the control pressure and spring force and open the main valve.

As soon as the inlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve cone into a controlling position.

When the inlet pressure falls below the set pressure the pilot valve closes. The pilot pressure continues to rise and the main valve also closes.

The pressure difference between inlet pressure and outlet pressure must be at least 0.5 bar!

The control unit contains adjustable restrictors which allow the control characteristics of the pressure reducer to be matched to the system (closing, opening and response speeds).

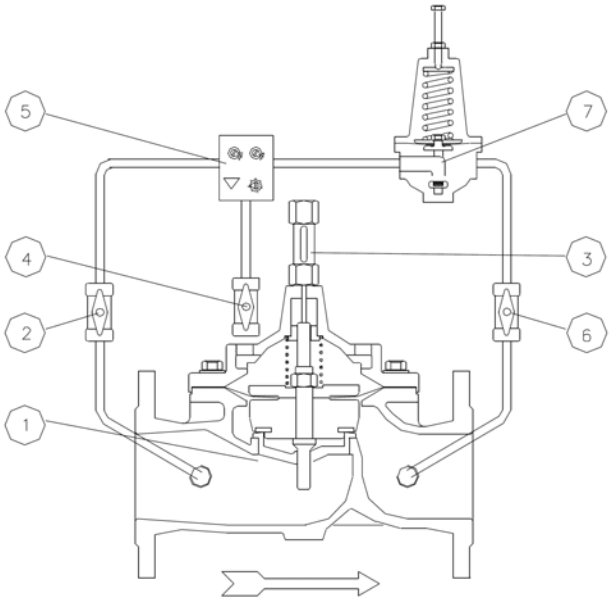
The overflow valve is completely piped. It does not require any additional pilot lines.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Options

- » set pressure range 1 - 7 bar
- » nominal diameters ≥ DN 500
- » rated pressure level PN 10, PN 25
- » special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



1 main valve
2 shut-off valve
3 vane relay
4 shut-off valve
5 control unit
6 shut-off valve
7 pilot valve

K_{vs}-values [m^3/h]					
nominal diameter DN	50	65	80	100	125
K_{vs}-value m^3/h	45	60	95	150	160

K_{vs}-values [m^3/h]					
nominal diameter DN	150	200	250	300	400
K_{vs}-value m^3/h	350	600	950	1300	1400

Pressure Control Valves

Pilot-operated Control Valves RP 116

Pilot-operated Backpressure Regulator

Materials - Main Valve	
Temperature	70 °C
Body	spherodial cast iron Epoxy-coated*
Cover	spherodial cast iron Epoxy-coated*
Internals	stainless steel, bronze, spherodial cast iron Epoxy-coated*
Spring	stainless steel
Valve Seal	NBR
O-Ring	NBR
Diaphragm	NBR-Nylon-reinforced*
Screws and Nuts	stainless steel

Materials - Pilot Circuit	
Control Unit	stainless steel
Pilot Valve	brass, internals made of stainless steel NBR diaphragm
Filter Seeve	1.4404
Sense Line	stainless steel
Fittings	brass
Shut-off Valves	brass, nickel plated

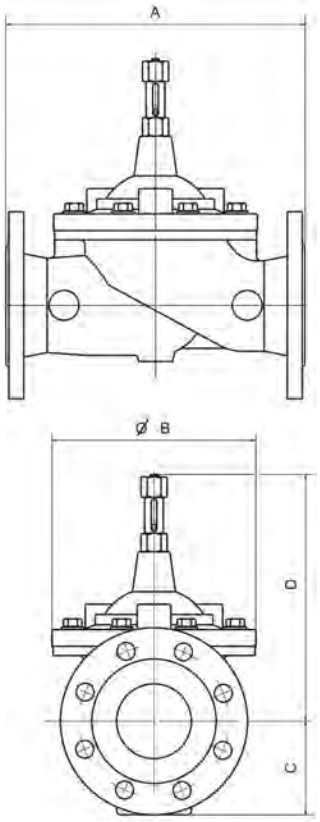
* in accordance with KTW-recommendation

Dimensions [mm] and Weights [kg]					
size	nominal diameterDN				
	50	65	80	100	125
A	230	290	310	350	400
B	162	194	218	260	304
C	83	93	100	118	135
D	233	255	274	316	383
kg	18	23,5	28	39	47

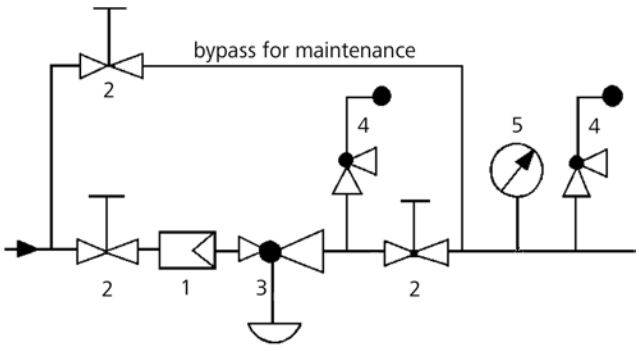
Dimensions [mm] and Weights [kg]					
size	nominal diameter DN				
	150	200	250	300	400
A	480	600	730	850	1100
B	370	454	570	710	710
C	150	180	213	242	310
D	431	523	620	670	709
kg	84	138	264	405	560

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Overflow Valve
4 Safety Valves
5 Pressure Gauge

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Pressure Control Valves

Pilot-operated Control Valves RP 810

Pilot-operated Pressure Reducing Valve

Technical Data

Connection DN	40 - 400
Nominal Pressure PN	16 - 160
Inlet Pressure	up to 160 bar
Outlet Pressure	1 - 40 bar
K_{vs}-Value	20 - 900 m^3/h
Temperature	130 °C
Medium	liquids

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The RP 810 pressure reducing valve is a pilot-controlled control valve consisting of a main valve, a pilot valve complete with restrictor assembly and built-in strainer mounted on the cover of the main valve, non-return valve and restrictor valves. The valve cone can be fitted with a soft or metallic seal.

When the pipeline is depressurised the main valve is kept closed by a preloaded spring. When the outlet pressure is below the set pressure the pilot valve is kept open by its spring. The control medium can flow towards the valve outlet. Restrictor D1 produces a pressure drop causing the outlet pressure to be almost equal to the pilot pressure in the main valve piston. The inlet pressure overcomes the outlet pressure and closing force of the spring and opens the main valve.

As soon as the outlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve piston into a controlling position. The restrictors D1 and D2 are used to optimise the control characteristics. The bypass fitted with a non-return valve ensures quick closing.

When the outlet pressure exceeds the set pressure the pilot valve closes. The pilot pressure is equal to the inlet pressure. The main valve closes as the piston diameter is greater than the valve seat. The spring also forces the valve to close.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

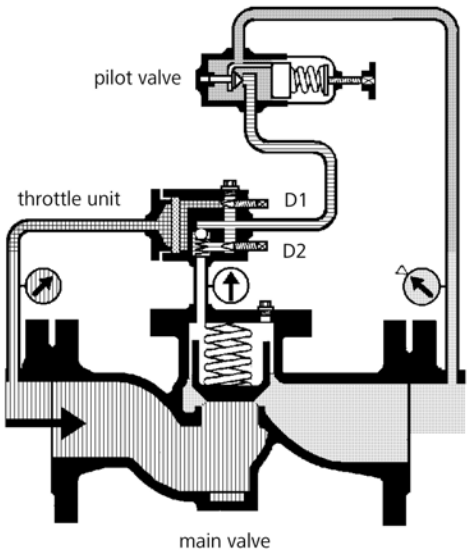
Standard

» pilot valve made of CrNiMo steel
» throttle block with integrated strainer and throttle valves completely made of CrNiMo steel

Options

» version for gases
» hard-faced valve cone and seat
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



K_{vs}-Values [m^3/h]						
nom. diam. DN	40	50	65	80	100	125
K_{vs}-value m^3/h	20	32	50	60	70	150

K_{vs}-Values [m^3/h]						
nom. diam. DN	150	200	250	300	350	400
K_{vs}-value m^3/h	250	350	500	600	700	900

Setting Ranges [bar], Nominal Pressure			
1 - 5	4 - 12	10 - 20	15 - 40
PN 16-160/10	PN 16-160/16	PN 16-160/40	PN 16-160/63

Pressure Control Valves

Pilot-operated Control Valves RP 810

Pilot-operated Pressure Reducing Valve

Materials			
Temperature		80 °C	130 °C
Body	PN 16	spherodial cast iron or cast steel	
	PN 160	cast steel	
	PN 16 - 160	CrNiMo-steel	
Cover		steel optional CrNiMo-steel	
Internals		chromium steel optional CrNi-steel or CrNiMo-steel	
Valve Seal		NBR	EPDM
O-Ring		NBR	EPDM
Pilot Valve, Throttle Unit		CrNiMo-steel	CrNiMo-steel

Dimensions [mm]

nominal pressure PN	size	nominal diameter DN					
		40	50	65	80	100	125
16	A	200	230	290	310	350	400
40	A	200	230	290	310	350	400
63 - 160	A	260	300	340	380	430	
alle PN	B	200	220	250	260	280	290
alle PN	C	140	160	180	220	220	230

Dimensions [mm]

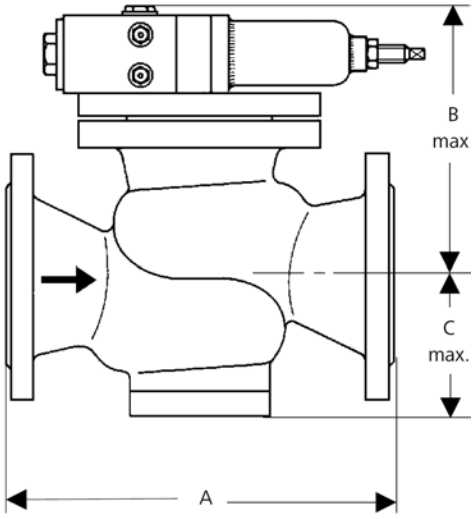
nominal pressure PN	size	nominal diameter DN					
		150	200	250	300	350	400
16	A_1	480	600	730	850	980	1100
40	A_1	480	600	730	850	980	
63 - 160	A_1	550	650				
alle PN	B	330	390	420	550	550	550
alle PN	C	240	270	290	350	350	410

Weights [kg]

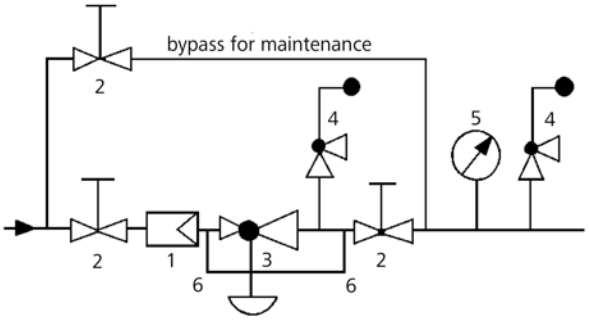
nominal pressure PN	nominal diameter DN											
	40	50	65	80	100	125	150	200	250	300	350	400
16	25	30	40	50	70	120	150	210	380	450	520	625
40	33	38	48	65	80	140	160	240	440	510	580	
63 - 160	40	45	55	80	110		165	290				

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2

sense line connection 10 x DN before and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pilot-operated Control Valves RP 810 Eck

Pilot-operated Pressure Reducing Valve

Technical Data

Connection DN	40 - 150
Nominal Pressure PN	16 - 160
Inlet Pressure	up to 160 bar
Outlet Pressure	1 - 40 bar
K_{vs}-Value	20 - 70 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The pressure reducing valve RP 810 Eck is a pilot-operated regulating valve consisting of a main valve with a pilot valve fixedly mounted on the cover and a throttle block with integrated strainer, non-return valve and throttle valves. The valve cone is either metallic or soft-sealed.

In a pressureless pipeline the main valve is closed by the pre-tensioned spring.
If the outlet pressure falls below the pre-set nominal value, the pilot valve is kept open by its spring. The control medium flows off towards the valve outlet. Throttle D1 brings about a pressure drop, so that the control pressure in the main valve piston nearly corresponds to the outlet pressure. The inlet pressure overcomes the outlet pressure and the closing spring force and opens the main valve.

Once the outlet pressure has reached the pre-set nominal value, the pilot valve starts to throttle. In doing so, the control pressure rises and pushes the main valve piston to a regulating position. The throttles D1 and D2 serve to optimise the regulating behaviour. The bypass equipped with a non-return valve brings about rapid closure.

If the outlet pressure exceeds the nominal value, the pilot valve closes. The control pressure is equivalent to the inlet pressure. The main valve closes because the piston diameter is larger than the valve seat. In addition, the spring also has a closing effect.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

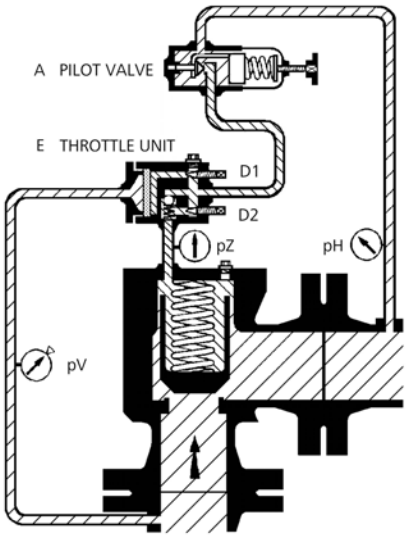
Standard

- pilot valve made of CrNiMo steel
- throttle block with integrated strainer and throttle valves completely made of CrNiMo steel
- internal piping made of CrNiMo-steel

Options

- damping for gas applications
- hard-faced valve cone and seat
- various O-ring and seal materials suitable for your medium
- special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
- special connections: ANSI or JIS flanges, other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



MAIN VALVE

K_{vs} Values [m^3/h]							
nominal diameter DN	40	50	65	80	100	125	150
K_{vs} value m^3/h	20	32	50	60	70	150	250

Pressure Range [bar], Nominal Pressure			
1 - 5	4 - 12	10 - 20	15 - 40
PN 16-160/10	PN 16-160/25	PN 16-160/40	PN 16-160/63

Other pressure ranges on request.

Pressure Control Valves

Pilot-operated Control Valves RP 810 Eck

Pilot-operated Pressure Reducing Valve

Materials		
Temperature	80 °C	130 °C
Body	steel optional CrNiMo-steel	
Cover	steel optional CrNiMo-steel	
Internals	Cr-steel optional CrNi-steel or CrNiMo-steel	
Valve Seal	NBR or CrNiMo-steel	EPDM or CrNiMo-steel
O-ring	NBR	EPDM
Pilot Valve	CrNiMo-steel	CrNiMo-steel
Throttle Unit		

Dimensions [mm]

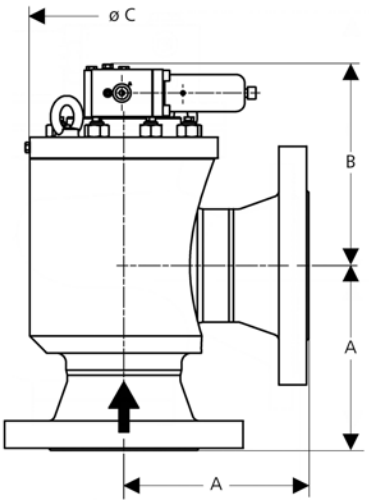
nominal pressure PN	size	nominal diameter DN						
		40	50	65	80	100	125	150
10 - 16	A	115	125	145	155	175	200	225
25 - 40	A	115	125	145	155	175	200	225
63 - 100	A	130	150	170	190	215	250	275
alle PN	B	200	210	210	230	260	290	300
alle PN	ø C	160	160	180	200	220	280	280

Weights [kg]

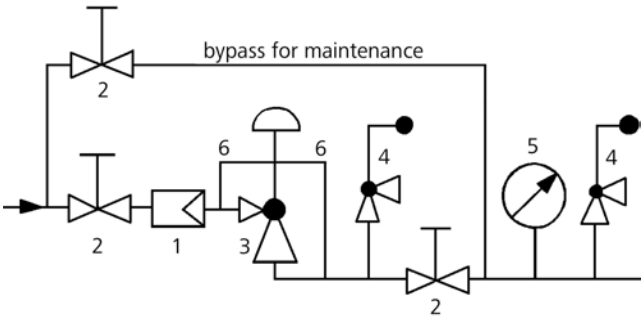
nominal pressure PN	nominal diameter DN						
	40	50	65	80	100	125	150
16 - 40	*	38	44	70	100	*	*
63 - 100	*	45	51	80	110	180	200

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shutoff Valves
3 Pressure Reducer
4 Safety Valve
5 Manometer
6 Sense Line G 1/2

sense line connection 10 DN before and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pilot-operated Control Valves RP 814, 815

Pilot-operated Pressure Reducing Valve

Technical Data

Connection DN	100 - 800
Nominal Pressure PN	16 - 25
Inlet Pressure	up to 25 bar
Outlet Pressure	1 - 20 bar
Differential Pressure	min. 2 bar
K_{vs}-Value	60 - 2100 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The RP 814 and RP 815 pressure reducing valves are pilot-controlled control valves of tubular design consisting of a main valve, a pilot valve connected with the main valve via pipes and a restrictor assembly with built-in strainer. The valve cone is fitted with a metallic seal.

When the pipeline is depressurised the main valve is kept closed by a preloaded spring. To open the valve a pressure difference (p1 – p2) of at least 2 bar is required.

When the outlet pressure is below the set pressure the pilot valve is kept open by its spring. The control medium can flow towards the valve outlet. Restrictor D1 produces a pressure drop causing the outlet pressure to be almost equal to the pilot pressure in the main valve. The inlet pressure overcomes the outlet pressure and closing force of the spring and opens the main valve.

As soon as the outlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve piston into a controlling position in which opening and closing forces are in balance.

When the outlet pressure exceeds the set pressure the pilot valve closes. The pilot pressure is equal to the inlet pressure. The forces acting on the piston are in equilibrium and the main valve is kept closed by its spring.

The restrictors are used to optimise the control characteristics. The bypass line around D2 which is fitted with a non-return valve, ensures quick closing.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

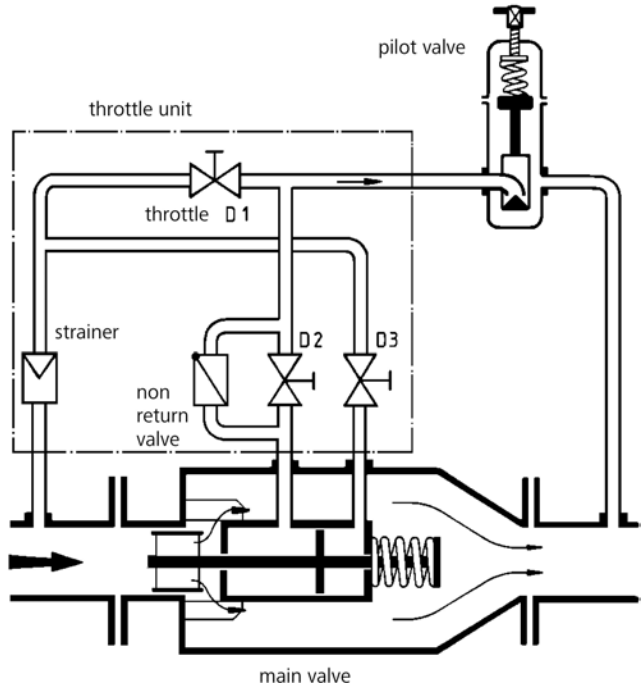
Standard

- pilot valve made of CrNiMo steel
- throttle block with integrated strainer and throttle valves completely made of CrNiMo steel
- internal piping made of CrNiMo-steel

Options

- nominal pressure level up to PN 100
- electrical limit switches
- special connections: ANSI or JIS flanges, other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



K_{vs}-Values [m^3/h]						
type	nominal diameter DN					
	100	125	150	200	250	300
814	60	100	120	180	250	400
815	180	200	250	400	600	800

K_{vs}-Values [m^3/h]							
type	nominal diameter DN						
	350	400	450	500	600	700	800
814	600	800	1100	1200	1800	2000	2100
815	1200	1800					

Setting Ranges [bar], Nominal Pressure		
1 - 5	4 - 12	10 - 20
PN 16 - 25/10	PN 16 - 25/25	PN 16 - 25/40

Pressure Control Valves

Pilot-operated Control Valves RP 814, 815

Pilot-operated Pressure Reducing Valve

Materials		
Temperature	80 °C	130 °C
Body	steel optional CrNiMo-steel welded	
Internals	CrNiMo-steel	CrNiMo-steel
Valve Seal	CrNiMo-steel	CrNiMo-steel
O-Ring	NBR	EPDM
Pilot Valve	CrNiMo-steel	CrNiMo-steel
Sense Line		
Throttle Unit		

Dimensions [mm] RP 814

size	nominal diameter DN												
	100	125	150	200	250	300	350	400	450	500	600	700	800
A	300	325	350	400	450	500	550	600	650	700	800	900	1000
B max.	200	200	220	240	270	300	320	350	380	400	450	500	550
E max.	270	270	270	270	270	270	270	270	270	270	270	270	270

Weights [kg] RP 814

PN	nominal diameter DN												
	100	125	150	200	250	300	350	400	450	500	600	700	800
16	60	60	65	75	120	150	190	240	300	360	420	480	540
25	75	75	80	90	135	165	220	280	360	400	460	580	720

Dimensions [mm] RP 815

size	nominal diameter DN							
	100	125	150	200	250	300	350	400
A	350	400	480	600	730	850	980	1100
B max.	220	240	270	300	320	350	400	450
øD max.	360	400	425	485	555	620	730	845
E max.	270	270	270	270	270	270	270	270

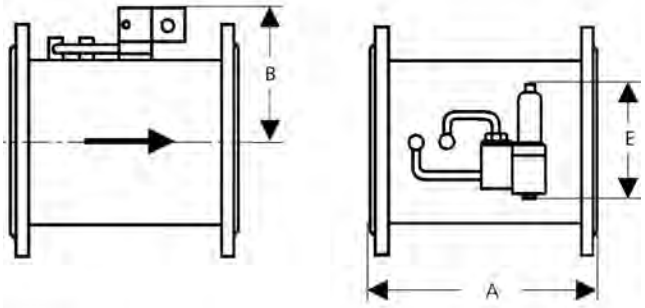
Weights [kg] RP 815

PN	nominal diameter DN							
	100	125	150	200	250	300	350	400
16	85	110	125	170	220	270	340	400
25	90	115	135	180	240	300	370	430

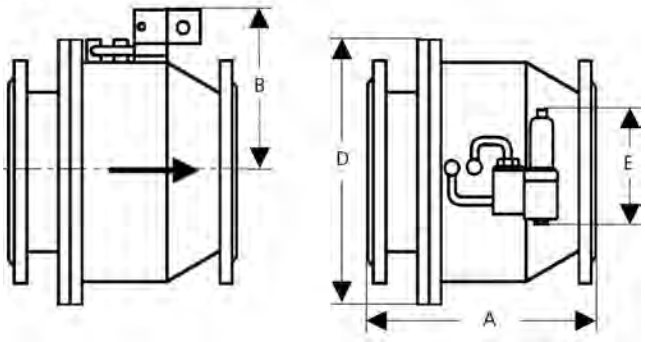
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

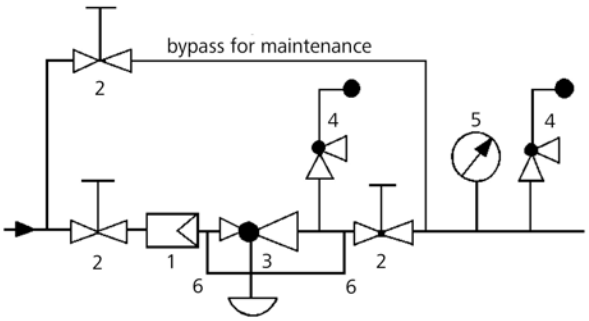
RP 814



RP 815



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Pressure Reducer
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 1/2

sense line connection 10 x DN bofore and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pilot-operated Control Valves RP 820

Pilot-operated Backpressure Regulator

Technical Data

Connection DN	40 - 400
Nominal Pressure PN	10 - 63
Inlet Pressure	2 - 40 bar
Differential Pressure	min. 2 bar
Outlet Pressure	up to 38 bar
K_{vs}-Value	20 - 900 m^3/h
Temperature	130 °C
Medium	liquids

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The RP 820 overflow valve is a pilot-controlled control valve consisting of a main valve, a pilot valve complete with restrictor assembly and built-in strainer mounted on the cover of the main valve, non-return valve and restrictor valves. The valve cone can be fitted with a soft or metallic seal.

When the pipeline is depressurised the main valve is kept closed by a preloaded spring.

When the inlet pressure is above the set pressure the pilot valve is kept open by a piston. The control medium can flow towards the valve outlet. Restrictor D1 produces a pressure drop causing the outlet pressure to be almost equal to the pilot pressure in the main valve piston. The inlet pressure overcomes the pilot pressure and closing force of the spring and opens the main valve.

When the inlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve piston into a controlling position. The restrictors D1 and D2 are used to optimise the control characteristics. The bypass fitted with a non-return valve ensures quick closing.

When the inlet pressure falls below the set pressure the pilot valve closes. The pilot pressure is equal to the inlet pressure. The main valve closes as the piston diameter is greater than the valve seat. The spring also forces the valve to close.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

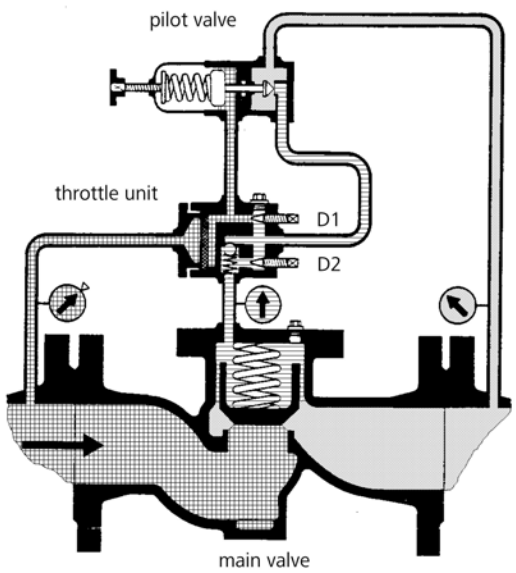
Standard

- pilot valve made of CrNiMo steel
- throttle block with integrated strainer and throttle valves completely made of CrNiMo steel

Options

- version for gases
- hard-faced valve cone and seat
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



K_{vs}-Values [m^3/h]						
nominal diameter DN	40	50	65	80	100	125
K_{vs}-value m^3/h	20	32	50	60	70	150

K_{vs}-values [m^3/h]						
nominal diameter DN	150	200	250	300	350	400
K_{vs}-value m^3/h	250	350	500	600	700	900

Setting Ranges [bar], Nominal Pressure			
2 - 5	4 - 12	10 - 20	15 - 40
PN 10	PN 25	PN 40	PN 63

Pressure Control Valves

Pilot-operated Control Valves RP 820

Pilot-operated Backpressure Regulator

Materials			
Temperature		80 °C	130 °C
Body	PN 10	spherodial cast iron or cast steel	
	PN 25, 40, 63	cast steel	
	PN 10 - 63	CrNiMo-steel	
Cover		steel optional CrNiMo-steel	
Internals		CR-steel optional CrNi-steel or CrNiMo-steel	
Valve Seal		NBR	EPDM
O-Ring		NBR	EPDM
Pilot Valve		CrNiMo-steel	CrNiMo-steel
Throttle Unit			

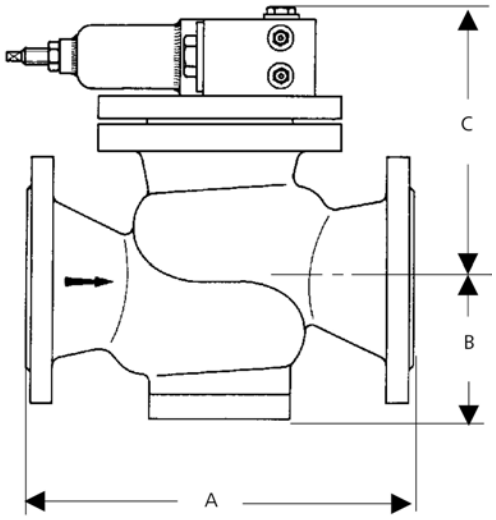
Dimensions [mm]							
nominal press. PN	size	nominal diameter DN					
		40	50	65	80	100	125
16	A	200	230	290	310	350	400
40	A	200	230	290	310	350	400
63	A	260	300	340	380	430	
all PN	B	140	160	180	220	220	230
all PN	C	200	220	250	260	280	290

Dimensions [mm]							
nominal press. PN	size	nominal diameter DN					
		150	200	250	300	350	400
16	A	480	600	730	850	980	1100
40	A	480	600	730	850	980	
63	A	550	650				
all PN	B	240	270	290	350	350	410
all PN	C	330	390	420	550	550	550

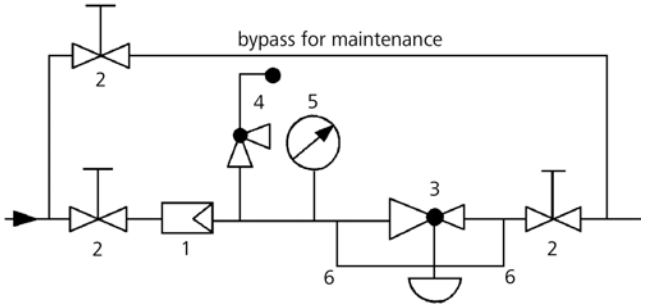
Weights [kg]												
PN	nominal diameter DN											
	40	50	65	80	100	125	150	200	250	300	350	400
16	25	30	40	50	70	120	150	210	380	450	520	625
40	33	38	48	65	80	140	160	240	440	510	580	
100	40	45	55	80	110		165	290				

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Overflow Valve
4 Safety Valves
5 Pressure Gauge
6 Sense Line

sense line connection 10 DN before and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pilot-operated Control Valves RP 820 Eck

Pilot-operated Backpressure Regulator

Technical Data

Connection DN	40 - 150
Nominal Pressure PN	10 - 100
Inlet Pressure	2 - 63 bar
Differential Pressure	minimum 2 bar
Outlet Pressure	up to 61 bar
K_{vs}-Value	20 - 250 m³/h
Temperature	130 °C
Medium	liquids

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The RP 820 overflow valve is a pilot-controlled control valve consisting of a main valve, a pilot valve complete with restrictor assembly and built-in strainer mounted on the cover of the main valve, non-return valve and restrictor valves. The valve cone can be fitted with a soft or metallic seal.

When the pipeline is depressurised the main valve is kept closed by a preloaded spring.

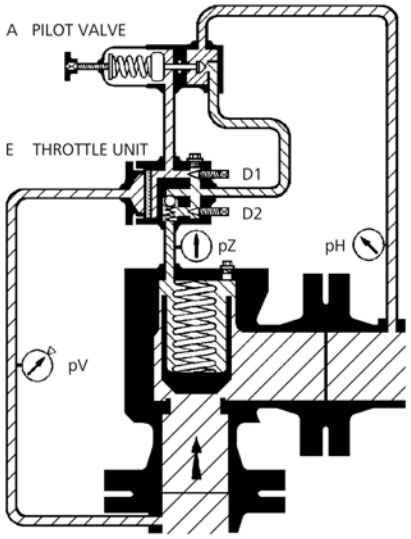
When the inlet pressure is above the set pressure the pilot valve is kept open by a piston. The control medium can flow towards the valve outlet. Restrictor D1 produces a pressure drop causing the outlet pressure to be almost equal to the pilot pressure in the main valve piston. The inlet pressure overcomes the pilot pressure and closing force of the spring and opens the main valve.

When the inlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve piston into a controlling position. The restrictors D1 and D2 are used to optimise the control characteristics. The bypass fitted with a non-return valve ensures quick closing.

When the inlet pressure falls below the set pressure the pilot valve closes. The pilot pressure is equal to the inlet pressure. The main valve closes as the piston diameter is greater than the valve seat. The spring also forces the valve to close.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.



MAIN VALVE

Standard

- pilot valve made of CrNiMo steel
- throttle block with integrated strainer and throttle valves completely made of CrNiMo steel
- internal piping made of CrNiMo-steel

Options

- damping for gas applications
- hard-faced valve cone and seat
- various O-ring and seal materials suitable for your medium
- special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
- special connections: ANSI or JIS flanges, other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} values [m³/h]							
nominal diameter DN	40	50	65	80	100	125	150
K_{vs} value m³/h	20	32	50	60	70	150	250

Set Pressure Ranges [bar], Nominal Pressure				
2 - 5	4 - 12	10 - 20	15 - 40	45 - 63
PN 10	PN 25	PN 40	PN 63	PN 100

Pressure Control Valves

Pilot-operated Control Valves RP 820 Eck

Pilot-operated Backpressure Regulator

Materials		
Temperature	80 °C	130 °C
Body	Steel optional CrNiMo-steel	
Cover	Steel optional CrNiMo-steel	
Innenteile	Cr-steel optional CrNi-steel or CrNiMo-steel	
Valve Seal	NBR or CrNiMo-steel	EPDM or CrNiMo-steel
O-ring	NBR	EPDM
Pilot Valve	CrNiMo-steel	CrNiMo-steel
Throttle Unit		

Dimensions [mm]

nominal pressure PN	size	nominal diameter DN						
		40	50	65	80	100	125	150
10 - 16	A	115	125	145	155	175	200	225
25 - 40	A	115	125	145	155	175	200	225
63 - 100	A	130	150	170	190	215	250	275
alle PN	B	200	210	210	230	260	290	300
alle PN	ø C	160	160	180	200	220	280	280

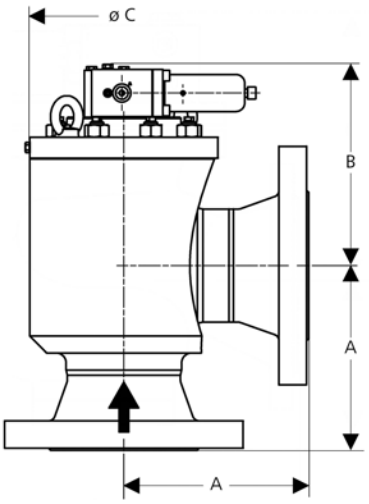
Weights [kg]

nominal pressure PN	nominal diamter DN						
	40	50	65	80	100	125	150
10 - 16	*	*	*	70	*	*	*
25 - 40	*	40	*	*	100	*	*
63 - 100	35	*	50	*	*	180	200

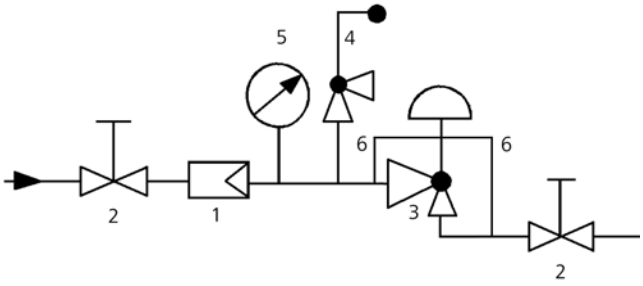
* on request

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Overflow Valve
4 Safety Valves
5 Pressure Gauge
6 Sense Line

sense line connection 10 x DN before and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pilot-operated Control Valves RP 824, 825

Pilot-operated Backpressure Regulator

Technical Data

Connection DN	100 - 800
Nominal Pressure PN	10 - 25
Inlet Pressure	2 - 20 bar
Differential Pressure	min. 2 bar
K_{vs}-Value	60 - 2100 m^3/h
Temperature	130 °C
Medium	liquids and gases

Description

Medium-controlled backpressure regulators are simple control valves offering accurate control while being easy to install and maintain. They control the pressure upstream of the valve without requiring pneumatic or electrical control elements.

The RP 824 and RP 825 overflow valves are pilot-controlled control valves of tubular design consisting of a main valve, a pilot valve connected with the main valve via pipes and a restrictor assembly with built-in strainer. The valve cone is fitted with a metallic seal.

When the pipeline is depressurised the main valve is kept closed by a preloaded spring. To open the valve a pressure difference (p1 – p2) of at least 2 bar is required.

When the inlet pressure is above the set pressure the pilot valve is kept open by its control mechanism. Restrictor D1 produces a pressure drop causing the outlet pressure to be almost equal to the pilot pressure in the main valve. The inlet pressure overcomes the pilot pressure and closing force of the spring and opens the main valve.

When the inlet pressure has reached the set pressure, the pilot valve restricts the flow. This causes the pilot pressure to rise and push the main valve piston into a controlling position in which opening and closing forces are in balance.

When the inlet pressure falls below the set pressure the pilot valve closes. The pilot pressure is equal to the inlet pressure, the forces acting on the piston are in equilibrium and the main valve is kept closed by its spring.

The restrictors are used to optimise the control characteristics. The bypass line around D2 which is fitted with a non-return valve, ensures quick closing.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

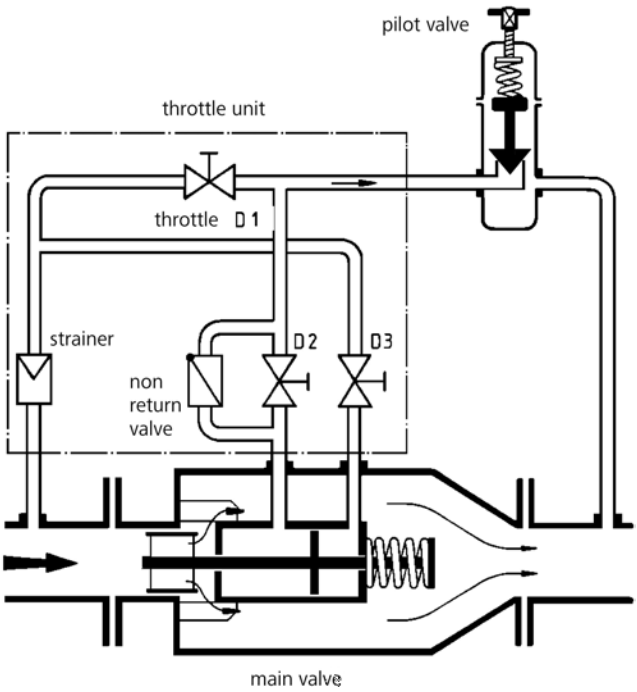
Standard

- pilot valve made of CrNiMo steel
- throttle block with integrated strainer and throttle valves completely made of CrNiMo steel
- internal piping made of CrNiMo-steel

Options

- nominal pressure level up to PN 100
- electrical limit switches
- special connections: ANSI or JIS flanges, other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



K_{vs}-Values [m^3/h]						
type	nominal diameter DN					
	100	125	150	200	250	300
824	60	100	120	180	250	400
825	180	200	250	400	600	800

K_{vs}-Values [m^3/h]							
type	nominal diameter DN						
	350	400	450	500	600	700	800
824	600	800	1100	1200	1800	2000	2100
825	1200	1800					

Setting Ranges [bar], Nominal Pressure		
2 - 5	4 - 12	10 - 20
PN 10	PN 16	PN 25

Pressure Control Valves

Pilot-operated Control Valves RP 824, 825

Pilot-operated Backpressure Regulator

Materials		
Temperature	80 °C	130 °C
Body	steel optional CrNiMo-steel welded	
Internals	CrNiMo-steel	CrNiMo-steel
Valve Seal	CrNiMo-steel	CrNiMo-steel
O-Ring	NBR	EPDM
Pilot Valve	CrNiMo-steel	CrNiMo-steel
Sense Line		
Throttle Unit		

Dimensions [mm] RP 824													
size	nominal diameter DN												
	100	125	150	200	250	300	350	400	450	500	600	700	800
A	300	325	350	400	450	500	550	600	650	700	800	900	1000
B max.	200	200	220	240	270	300	320	350	380	400	450	500	550
E max.	270	270	270	270	270	270	270	270	270	270	270	270	270

Weights [kg] RP 824													
PN	nominal diameter DN												
	100	125	150	200	250	300	350	400	450	500	600	700	800
16	60	60	65	75	120	150	190	240	300	360	420	480	540
25	75	75	80	90	135	165	220	280	360	400	460	580	720

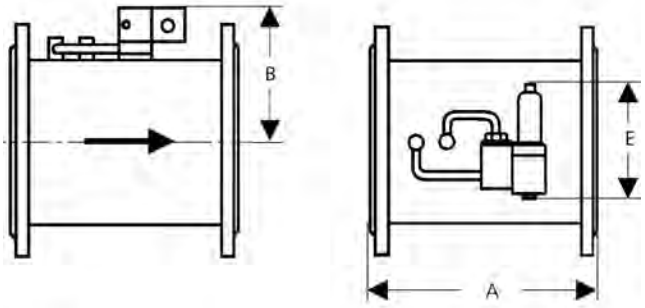
Dimensions [mm] RP 825								
size	nominal diameter DN							
	100	125	150	200	250	300	350	400
A	350	400	480	600	730	850	980	1100
B max.	220	240	270	300	320	350	400	450
øD max.	360	400	425	485	555	620	730	845
E max.	270	270	270	270	270	270	270	270

Weights [kg] RP 825								
PN	nominal diameter DN							
	100	125	150	200	250	300	350	400
16	85	110	125	170	220	270	340	400
25	90	115	135	180	240	300	370	430

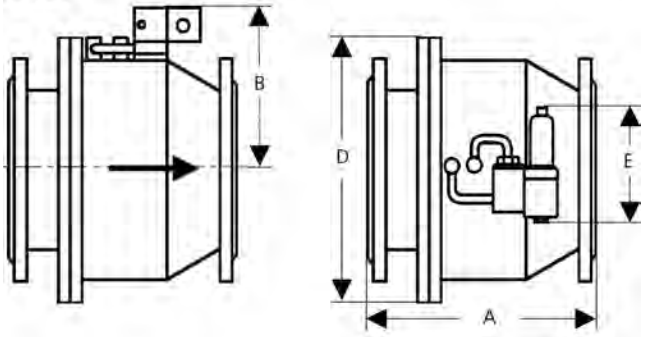
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

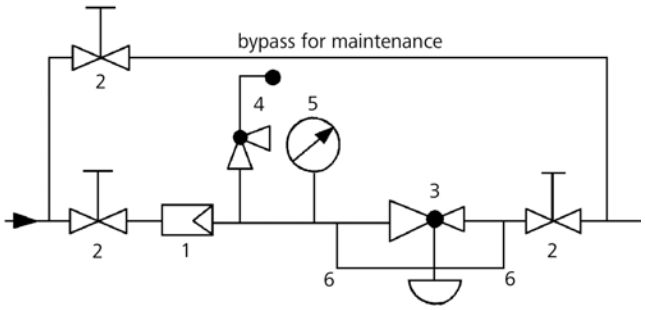
RP 824



RP 825



Recommended Installation



1 Strainer
2 Shut-off Valves
3 Overflow Valve
4 Safety Valves
5 Pressure Gauge
6 Sense Line G 3/8 (option)

sense line connection 10 x DN before and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Pilot-operated Control Valves RP 840

Pilot-operated Millibar Control Valve

Technical Data

Connection DN	25 - 150
Nominal Pressure PN	16
Inlet Pressure	up to 16 bar
Outlet Pressure	0.002 - 0.52 bar
K_{vs}-Value	4 - 160 m³/h
Temperature	130 °C
Medium	Gases

Description

Medium-controlled pressure reducers are simple control valves offering accurate control while being easy to install and maintain. They control the pressure downstream of the valve without requiring pneumatic or electrical control elements.

The pressure reducing valve RP 840 is a pilot-operated control valve consisting of a main valve for high flow rates combined with a millibar valve serving as pilot valve. Both valves are manufactured from deep-drawn stainless steel featuring excellent corrosion resistance and are arranged as a pre-mounted unit in a rack. The valve cone is soft-sealed.

In a pressureless pipeline the main valve is closed by the pre-tensioned spring.

If the outlet pressure falls below the pre-set nominal value, the pilot valve is kept open by its spring. The control medium flows off towards the valve outlet. Throttle D1 brings about a pressure drop, so that the control pressure in the main valve control mechanism nearly corresponds to the outlet pressure. The inlet pressure overcomes the outlet pressure and the closing spring force and opens the main valve.

Once the outlet pressure has reached the pre-set nominal value, the pilot valve starts to throttle. In doing so, the control pressure rises and pushes the main valve control mechanism to a regulating position. The throttles D1 and D2 serve to optimise the regulating behaviour. The bypass equipped with a non-return valve brings about rapid closure.

If the outlet pressure exceeds the nominal value, the pilot valve closes. The control pressure is equivalent to the inlet pressure. The main valve closes because the control mechanism diameter is larger than the valve seat. In addition, the spring also has a closing effect.

The valve is piped internally. The pulse lines must be installed on-site.

These valves are no shut-off elements ensuring a tight closing of the valve. In accordance with the VDI/VDE guideline 2174 a leakage rate of 0.05 percent of the K_{vs} value is permitted for the valve in closed position.

Standard

» completely piped
» pre-mounted unit in a rack

Options

» pressure gauge connection
» various diaphragm and seal materials suitable for your medium
» special connections: Aseptic, ANSI or JIS flanges, NPT, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} Values [m³/h]

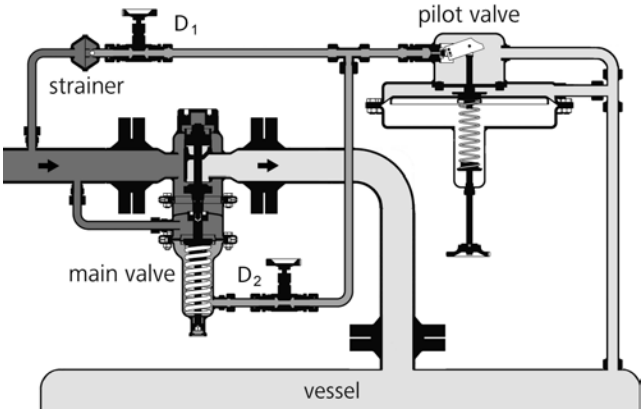
Mainvalve	nominal diameter DN							
	25	40	50	65	80	100	125	150
DV 5.1	4	22	22	-	-	-	-	-
DV 4.8	-	-	32	50	80	100	-	-
DV 4.1	6	20	32	50	80	100	140	160

Setting Ranges [bar]

pilot valve diaphragm diameter 500 mm			
0.002 - 0.003	0.003 - 0.015	0.008 - 0.03	0.012 - 0.07
pilot valve diaphragm diameter 360 mm			
0.004 - 0.006	0.005 - 0.032	0.015 - 0.06	0.025 - 0.14
pilot valve diaphragm diameter			
0.008 - 0.016	0.015 - 0.065	0.02 - 0.12	0.05 - 0.28
pilot valve diaphragm diameter			
0.015 - 0.030	0.025 - 0.125	0.05 - 0.22	0.1 - 0.52

Reduction Ration (max. p_1/p_2)

diaphragm diameter[mm]			
500	360	270	220
10000	6000	3000	1800



Pressure Control Valves

Pilot-operated Control Valves RP 840

Pilot-operated Millibar Control Valve

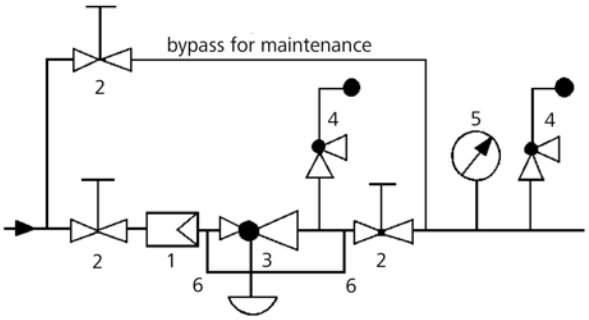
Materials and Dimensions Main Valve

see main valve UV 4.1, UV 4.8 or UV 5.1

Materials and Dimensions Pilot Valve

see DM 762

Recommended Installation



1 strainer
2 shut-off valve
3 pressure control valve
4 safety valve
5 manometer
6 sence line G 1/2

sense line connection 10 x DN before and behind the valve
use MANKENBERG-Products

Pressure Control Valves

Surge Relief Valves

Surge Relief Valve (Peak Load)			SR 6.2
self-energized for extreme flow rates | straightway valve with optimised design with least possible flow loss | directly acting or pilot-operated | shortest possible response times | suitable for all liquids | valve of welded steel, CrNiMo steel or special stainless steel | can be designed for any application, any problem with regards to pressure relief can be solved | versions for vertical or horizontal installation			
DN	100 - 400	PN	16 - 100
p_1	max. 160 bar	K_{vs}	400 - 2400 m^3/h
C_{vs}	1760 - 10500 US gal/min	T	- 30 up to + 130 °C - 22 up to + 266 °F

Pressure Control Valves

Surge Relief Valves SR 6.2

Surge Relief Valve (Peak Load)

Technical Data

Connection DN	100 - 400
Nominal Pressure PN	16 - 100
Set Pressure	max. 160 bar
K_{vs}-Value	400 - 2400 m^3/h
C_{vs}-Value	1760 - 10500 US gal/min
Temperature	- 30 up to + 130 °C - 22 up to + 266 °F
Medium	liquids

Description

Pressure relief valves are used for the decay of pressure surges and of permanent overpressures within pipeline systems.

SR 6.2K and SR 6.2P are self-energized valves with lowest possible response times. They operate without any auxiliary or external energy. The body is of welded construction and, therefore, very lightweight compared with cast ones. Building length, connections and materials can be customized to any requirement. The straightway valve with optimised design features the least possible flow loss. The valve cone is of the soft seal type.

SR 6.2K is directly acting with piston actuation. The response pressure has been pre-set.

SR 6.2P is pilot-controlled, the response pressure and the closing time are adjustable. If a second pilot valve is used, the valve can be switched to another pre-set response pressure.

At the control unit (closing piston) the inlet pressure is in balance with the valve spring force (set value). If the inlet pressure rises above the set value, the valve opens (in the pilot valve and/or in the inner chamber of the main valve). With the inlet pressure falling the valve closes, driven by the spring tension and the increasing pressure downstream of the closing piston. In a depressurized line the valve remains closed.

The valves are completely tubed. Control lines or similar are not required. The version for either horizontal or vertical installation can be selected.

Standard

- ANSI or DIN flanges
- coating of the body: primer and top coat
- MOD (manual opening device) for function control, bleeding or flushing
- vertical installation position
- transport lugs

Options

- coating as per DIN EN ISO 12944 C5-M, DIN 55633
- special materials such as Duplex steel
- various materials for O rings and seals, suitable for your medium
- version for horizontal installation position incl. bridge (supporting structure), position of the control element can be selected
- enlarged MOD „manual opening device“ for viscous media
- flow monitor on the outlet side
- medium separating device
- tamper-proof adjustment elements for protection against unauthorized access
- exchangeable filter for the pilot system (SR 6.2P)
- contamination level indicator for the pilot system (SR 6.2P)
- special connection upon request
- special versions upon request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure.
We reserve the right to alter technical specifications without notice.

K_{vs} Values [m^3/h]					
nominal diameter DN	150	200	250	300	400
SR 6.2K	400	720	1000	1500	2000
SR 6.2P	470	850	1200	1800	2400

C_{vs} Values [US gal/min.]					
nominal diameter DN	150	200	250	300	400
SR 6.2K	465	837	1183	1744	2325
SR 6.2P	547	988	1395	2093	2791

Pressure Control Valves

Surge Relief Valves SR 6.2

Surge Relief Valve (Peak Load)

Materials	
Body	steel- or CrNiMo steel welded
Inner Parts	CrNiMo steel
Pilot System	
MOD	
Valve Seal	HNBR
Piston Seal	PTFE
Piston Guide	PTFE
Pressure Springs	coated spring steel or CrNi steel

Dimensions [mm]					
size	nominal diameterDN				
	150	200	250	300	400
A	on request				
B					

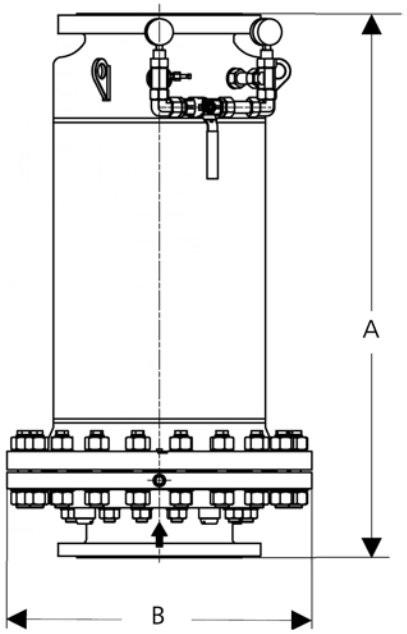
Weights [kg]					
nominal pressure	nominal diameter DN				
	150	200	250	300	400
PN 16 - 160	on request				

Since the pressure relief valve SR 6.2 will be customized to your operating data and its structural shape may vary considerably, we cannot specify any detailed dimensions or weights. Please let us have your enquiry.

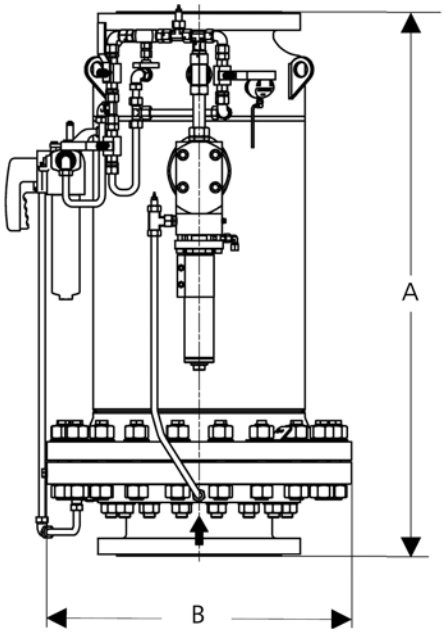
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

UV 6.2K



UV 6.2P



Bleeding and Venting Valves

Continuous Bleeding and Venting Valves

Sturdy Valves of Cast Steel			EB 1.10, 1.11
For larger air volumes, e.g. on sand filters, stainless steel float and lever control the valve shut-off, EB 1.11 with external float, EB 1.20 for maximum air volumes | valve cone with soft or metallic seal | body made of GGG-40, GS-C25 | for contaminated and foaming media, available with various coating types			
DN	32/15 - 100/50	PN	40
p	0 - 40 bar	Q	2440 Nm^3/h
T	200 °C		

Compact Standard Bleeding Valve			EB 1.12
float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing, outlet at the side | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | available in special materials, such as seawater-resistant stainless steel, titanium, Hastelloy® etc.			
DN	25 - 100	G	3/4 - 2
PN	16	p	0 - 16
Q	248 Nm^3/h	T	130 °C

Large Sized Cast Bleeding and Venting Valve			EB 1.20
For very large flow rates / body made of GGG-40, GS-C 25 / inner parts of Cr/CrNiMo-steel			
DN	80/65 - 200/150	PN	16 - 40
p	0 - 40 bar	Q	7770 Nm^3/h
T	200 °C		

Compact Standard Bleeding Valve			EB 1.32
float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing | outlet to the top | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | available in special materials, such as seawater-resistant stainless steel, titanium, Hastelloy® etc. | also available with non-return valve as pure bleeding valve			
G	3/4 x 1/2A	PN	16
p	0 - 16	Q	5,9 m^3/h
T	130 °C		

Bleeding and Venting Valve with sight glass			EB 1.48
float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosionresistant, very lightweight and compact			
G	1/2	PN	16
p	0 - 16 bar	Q	28 Nm^3/h
T	130 °C		

Know How Bleeding and Venting Valves

Bleeding and venting valves remove or admit air or gases automatically from/to tanks, vessels or pipelines. They are float-controlled valves which close as the liquid level rises and open as the level falls.

Operation
A rising liquid level lifts the float and closes the valve, in most cases via a system of levers. If the liquid level drops because air is entering the system or the plant is being started up, the valve will open and either admit air or vent the air from the system.

Start-up bleeding and venting valves
are used to vent low-pressure plant systems when such systems are started up or filled. The float acts directly on the cone. They have a large seat diameter to ensure fast venting for pressures below 0.1 bar. During operation these valves are kept closed by the internal system pressure. A suddenly occurring vacuum causes them to open and equalise the pressure. This prevents damage which a vacuum may cause.

Continuous vent valves
are used to remove air which accumulates as the plant operates. They incorporate a lever system which enables them to operate at very low and high pressures.
A non-return valve can be fitted to the outlet side of these valves to prevent air entering the system. In this case they are pure vent valves, no air enters the system.

Combined Bleeding and Venting Valves
are combined start-up and continuous bleed/venting valves. They have a large seat for start-up operation and a small seat for continuous operation, which are controlled by a float via a system of levers. Both valve seats are open while the system is being filled. During system operation the large seat is kept closed by the internal pressure. Any accumulating small air volumes are vented from the system via the small valve seat. If the pressure drops below 0.1 bar the large valve seat can open again. If a vacuum occurs which may be caused, for instance, by a pump failure, the large seat opens instantaneously and prevents damage.
If subsequently a pressure surge runs back through the pipeline, the large seat closes causing the air volume which has entered the system to act as a damper while escaping to atmosphere through the small seat.

Elastomers and coatings
Standard valves can be used for water up to 80 °C, in certain cases up to 130 °C, higher temperatures with special types.
For ozone we supply a special version fitted with special elastomers. For hydrocarbons like petrol, gasoline etc. we use FPM. For hot mineral water, sea water and other liquids containing chloride we supply valves that feature coated bodies and internal components. For corrosive media we supply rubber-coated valves. In addition we can supply special valves manufactured from high-molybdenum materials.
Please note that our stainless steel venting valves are in most cases cheaper than equivalent cast iron valves.

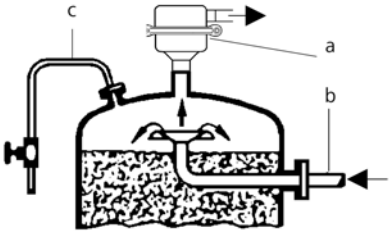
Operating pressure range
You should select an operating pressure range which covers the maximum pressure that may occur, as otherwise the vent valve will not open. You should select the type and size of vent valve according to the air volume to be removed at operating pressure. You will find the appropriate tables in the data sheets. The throughput capacities given in these tables apply to a fully open valve i.e. when the system is started up or as long as the liquid level remains below the vent valve inlet. For steady and continuous venting, e.g. of filter vessels, the throughput capacity should be reduced by approximately 30%.
To ensure smooth operation and long life, continuous vent valves should not be overdimensioned. If the throughput capacity is excessive for a given nominal diameter, a higher operating pressure coupled with a correspondingly lower throughput may provide the solution.

Installation
Vent valves should always be installed at high points in pipelines or vessels. Do not install vent valves on standpipes or in flushing lines but at those points where air accumulates. Select a pipe run where the flow velocity is reduced and, if required, install a vent dome. You should choose an installation site where the vent valve is not likely to "hammer" and thereby get damaged.

During venting slugs of water must not be carried over and enter the valve body at high speed. If you are in doubt you should install a baffle or deflector.
Please make sure that the cross-sectional area of the tank outlet is not less than that of the vent valve inlet.
Under certain conditions (steam, foaming, very high flow velocity, contamination) a vent valve may "spit" i.e. discharge a small quantity of water when closing. For this reason it is recommended to fit a blow-off line to the outlet of the valve, if required.
In the case of large air capacities, great turbulence, two-phase mixed media or side-mounting of the valve because of restricted headroom above the tank, a pipeline should be installed between the bleed valve cover and the highest point of the tank (i.e. a balancing line such as is used with level control valves). For this purpose the bleed valve cover must be fitted with an additional connector.

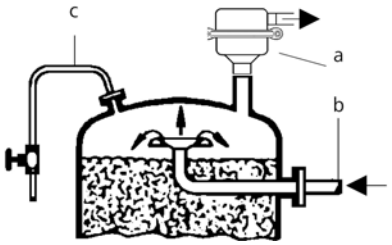
Example for insatllation on a filter vessel

Picture 1: wrong, in center



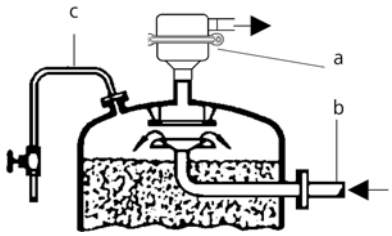
a = Bleeding/venting valve b = Water supply c = Vent line

Picture 2: right, off-centre



a = Bleeding/venting valve b = Water supply c = Vent line

Picture 3: right, with deflector



a = Bleeding/venting valve b = Water supply c = Vent line

Know How Bleeding and Venting Valves

Bleeding and venting valves remove or admit air or gases automatically from/to tanks, vessels or pipelines. They are float-controlled valves which close as the liquid level rises and open as the level falls.

Pollution
If you have polluted liquids and the vent valve must be cleaned from time to time, please, install a stop valve between tank, vessel resp. pipeline and vent valve. This is not necessary if the equipment to be vented can be simple depressurized.

Operation
Pressure surges or water hammer can destroy a float. For this reason suitable protective devices should be installed in the system.
With foaming media and their reduced specific density, bleeding/venting valves cannot operate reliably. For such applications we strongly recommend the installation of a smoothing vessel. In such cases our bleeding/venting valves type EB 1.11 and EB 1.84 may be used.

Maintenance
Pressure reducers must be cleaned and serviced regularly, especially in the case of liquids containing compounds which tend to form deposits such as iron or lime.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, Operating Instruction etc. MUST be followed.

Selection Bleeding and Venting Valves

continuous bleeding and venting valves

max. inlet press. bar	T °C	Q at 6 bar Nm^3/h air	Q max Nm^3/h air	connection G	connection DN	*	SS	notes	type
16	130	9,8	12	3/4		*	•	small economical vent valve for water treatment, also for ozone	1.12
16	130	9,8	12	3/4		*	•	small economical vent valve for water treatment, also for ozone	1.32
16	130	22,2	28	1/2		*	•	including sight glass	1.48
16	130	61	73	1 - 2	25 - 50	*	•	vent valve for water treatment, also for ozone	1.12
16	130	246	248		65 - 100	*	•	vent valve for water treatment, also for ozone	1.12
16 - 40	200	630	2440		32 - 100			vent valve for sand filter	1.10
16 - 40	200	630	2440		32 - 100			with external float for contaminated and foaming liquids	1.11
16 - 40	200	5215	7770		80 - 200			vent valve for large capacity	1.20
16 - 63	200	on request				*	•	vent valve for high operating pressures	1.32So

* other connections available, •stainless steel deep drawn

flow rates are valid for dry air with 0°C and 1.01325 bar

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.10, 1.11

Sturdy Valves of Cast Steel

Technical Data

Connection DN	32/15 - 100/50
Nominal Pressure PN	40
Operating Pressure	0 - 40 bar
Flow Rate	2440 Nm^3/h
Temperature	200 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

The EB 1.10 and EB 1.11 bleeding/venting valves are float-controlled robust valves made of spherical-graphite cast iron or cast steel to handle large air volumes e.g. in sand filters. The internal components are made of stainless steel featuring excellent corrosion resistance. Up to 130 °C the valve cone is fitted with a soft seal; up to 200 °C the seal is metallic.
EB 1.11 is fitted with an external float and specially suitable for foaming and contaminated media.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Valves for continuous bleeding must not be overdimensioned. If a larger valve size is selected, a higher working pressure range with a correspondingly lower flow volume should be chosen. In case of doubt we shall be happy to advise you.

On filter vessels the bleed connection is often located in the middle of the vessel. If the flow volume is large and the distance between distribution funnel and bleed connection small, the incoming water jet hits the bleed connection. This will impair the efficiency of the bleed valve and can result in water hammer. This problem may be avoided by installing a baffle or by placing the bleed connection away from the centre.

For the EB 1.11 the supplied float rod guide is to be installed in such a way that the float rod will be vertically guided. It must not obstruct the lift movement of the float.

Standard

» manual bleed valve made of stainless steel (supplied loose and must be fitted on-site)
» EB 1.11 with float rod guide (must be fitted on-site)

Options

» rubber or plastic coating for corrosive fluids
» non-return valve to prevent venting
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar] EB 1.10, EB 1.11						
PN 16	0 - 2	0 - 6	0 - 10	0 - 16	-	-
PN 40	0 - 2	0 - 6	0 - 10	0 - 16	0 - 25	0 - 40

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.10, 1.11

Sturdy Valves of Cast Steel

Materials			
Temperature		130 °C	200 °C
Body	PN 16	spherodial cast iron	spherodial cast iron
	PN 25/40	cast steel	cast steel
Body Seal		Nova Universal	Nova Universal
Internals		CrNiMo-steel	CrNiMo-steel
Float		CrNiMo-steel	CrNiMo-steel
Valve Seal		FPM	metallic

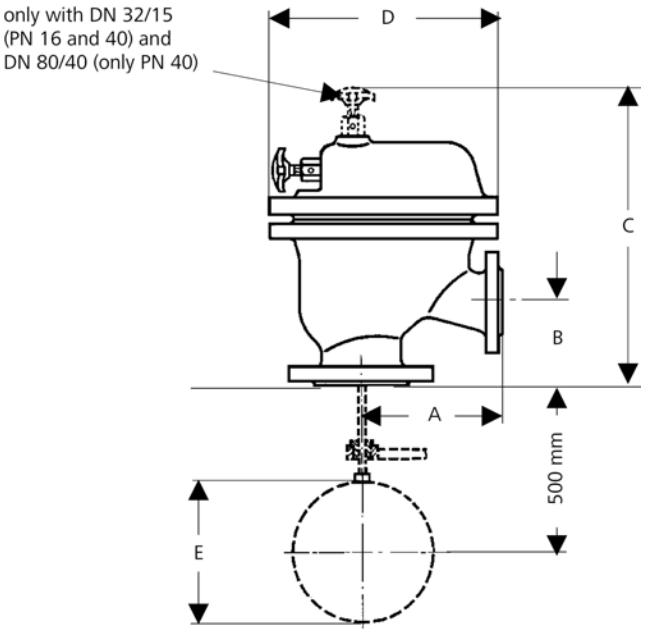
Dimensions [mm]							
nom. pressure PN	size	nominal diameter DN					
		32/15	40/20	50/25	65/32	80/40	100/50
16	A	120	130	140	160	185	205
	B	70	95	95	105	110	180
	C	260	240	250	270	315	375
	D	205	225	245	270	315	355
25/40	A	130		160		200	
	B	70		100		110	
	C	275		260		385	
	D	225		270		350	

Weights [kg]						
nom. pressure PN	nominal diameter DN					
	32/15	40/20	50/25	65/32	80/40	100/50
16	11	14	18	23	31	45
25/40	18		23		41	

Float Dimensions [mm] EB 1.11							
pressure ranges [bar]	size	nominal diameter DN					
		32/15	40/20	50/25	65/32	80/40	100/50
0 - 2 / 0 - 6	E	110	110	110	130	160	180
0 - 10		110	130	130	150	180	200
0 - 16		120	150	150	180	200	220
0 - 25 / 0 - 40		150		180		280	

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.10, 1.11

Sturdy Valves of Cast Steel

Seat Diameter[mm] EB 1.10						
pressure range bar	nominal diameter DN					
	32/15	40/20	50/25	65/32	80/40	100/50
0 - 2	6	7.5	8	10	13	16
0 - 6	4	4.5	5	6	9	12
0 - 10	3	3.5	4	5	7.5	10
0 - 16	2	2.5	3.5	4	5.5	8
0 - 25	2		3		4.5	
0 - 40	1.5		2		3.5	

Seat Diameter [mm] EB 1.11						
pressure range bar	nominal diameter DN					
	32/15	40/20	50/25	65/32	80/40	100/50
all ranges	6	7.5	8	10	13	16

Air Flow Rate [Nm^3/h] up to Δp 10 bar								
seat ø mm	differential pressure Δp bar							
	0.1	0.5	1	2	4	6	8	10
1.5	0.5	1.2	1.5	2.3	3.9	5.5	7.1	8.7
2	1	2.2	2.8	4.2	7	9.8	12	15
2.5	1.6	3.4	4.4	6.6	11	15	19	24
3	2.3	5	6.3	9.5	15	22	28	34
3.5	3.1	6.8	8.6	12	21	30	38	47
4	4.1	8.9	11	16	28	39	50	62
4.5	5.2	11	14	21	35	50	64	78
5	6.4	13	17	26	44	61	79	96
5.5	8	16	21	32	53	75	96	118
6	9.3	20	25	38	63	88	114	140
7.5	14	31	39	59	99	138	178	218
8	16	35	45	67	113	157	203	248
9	21	45	57	85	143	200		
10	25	55	70	106	176	246	317	388
12	37	80	102	152	254	355		
13	43	94	119	178	298	416	535	655
16	66	143	180	270	451	630	811	992

Air Flow Rate [Nm^3/h] from Δp 12 bar							
seat ø mm	differential pressure Δp bar						
	12	16	20	25	30	35	40
1.5	10	13	16	20	24	28	32
2	18	24	29	36	43	50	57
2.5	28	37					
3	41	54	66	82			
3.5	56	73	90	112	133	155	176
4	73	95					
4.5	93	121	150	185			
5							
5.5	139	182					
6	165	216	266	330	393	456	520
7.5	258	336					
8	293	383	473	586	697	810	923
9							
10	459	599					
12							
13	774	1010	1250	1550	1840	2140	2440
16	1170	1530					

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

The quoted flow volumes apply to a fully open valve i.e. in start-up condition at 0 °C and 1013 mbar. With continuous bleeding e.g. of filter vessels, the maximum flow volume is 30 % less on average.

* Please note: Smaller seat diameter for higher pressure range.
If the selected working pressure range is too high, the flow volume may be inadequate.

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.12

Compact Standard Bleeding Valve

Technical Data

Connection DN	25 - 100
Connection G	3/4 - 2
Nominal Pressure PN	16
Operating Pressure	0 - 16
Flow Rate	248 Nm^3/h
Temperature	130 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves.

The EB 1.12 bleeding/venting valves are compact and lightweight float-controlled valves for water treatment (incl. ozone), pipelines, petrol tanks etc. They are manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone can be fitted with a soft or metallic seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Valves for continuous bleeding must not be overdimensioned. If a larger valve size is selected, a higher working pressure range with a correspondingly lower flow volume should be chosen. In case of doubt we shall be happy to advise you.

On filter vessels the bleed connection is often located in the middle of the vessel. If the flow volume is large and the distance between distribution funnel and bleed connection small, the incoming water jet hits the bleed connection. This will impair the efficiency of the bleed valve and can result in water hammer. This problem may be avoided by installing a baffle or by placing the bleed connection away from the centre.

Standard

- all stainless steel construction
- quick-release body clamp ring

Options

- ozone-resistant design
- various seal materials suitable for your medium
- plastic coating for corrosive fluids
- special materials such as Duplex, Superduplex, Hastelloy® or titanium
- special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]			
nominal diameter G 3/4 x 1/2 A			
press. range bar	0 - 2	0 - 6	0 - 16

Pressure Ranges [bar]				
nominal diameter G 1 - 2, DN 25 - 100				
press. range bar	0 - 2	0 - 6	0 - 10	0 - 16

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.12

Compact Standard Bleeding Valve

Materials		
Design	standard	
Type	G 3/4 - 2, DN 25 - 50	DN 65 - 100
Temperature	130 °C	130 °C
Body	CrNiMo-steel	CrNiMo-steel
Body Seal	EPDM	EPDM
Internals	CrNiMo-steel	CrNiMo-steel
Float	CrNiMo-steel	CrNiMo-steel
Valve Seal	FPM	CrNiMo-steel
Profile Clamp	CrNiMo-steel	CrNiMo-steel

Materials		
Design	ozone resistant	
Nominal Diameter	G 3/4	G 1-2, DN 25-100
Temperature	80 °C	100 °C
Body	CrNiMo-steel	CrNiMo-steel
Body Seal	FPM	FPM
Internals	CrNiMo-steel	CrNiMo-steel
Float	CrNiMo-steel	CrNiMo-steel
Valve Seal	CSM	CrNiMo-steel
Profile Clamp	CrNiMo-steel	CrNiMo-steel

Dimensions [mm] G 3/4x1/2	
size	inlet female G 3/4, outlet male G 1/2 A
A	109
B	57
C	127
D	140

size A tolerance ± 4 mm

Weights [kg] G 3/4x1/2
0.8

Dimensions [mm] G 1 - 2, DN 25 - 100											
size	inlet female G				inlet flange DN						
	1	1 1/4	1 1/2	2	25	32	40	50	65	80	100
	outlet male G 3/4A										
A	146	149	149	145	161	163	165	164	250	255	257
B	140	140	140	140	140	140	140	140	113	113	113
C	185	190	190	185	200	200	205	205	295	300	305
D	200	200	200	200	200	200	200	200	265	265	265

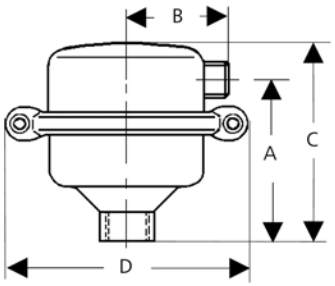
size A tolerance ± 4 mm

Weights [kg] G 1 - 2, DN 25 - 100										
inlet female G				inlet flange DN						
1	1 1/4	1 1/2	2	25	32	40	50	65	80	100
2.6	2.6	2.7	3.1	3.5	4.2	4.2	5	11	11	12

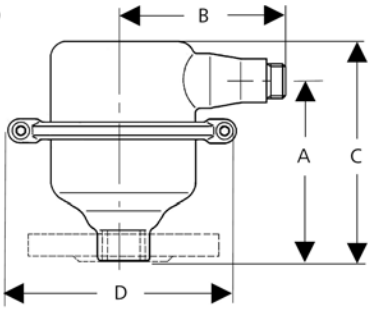
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

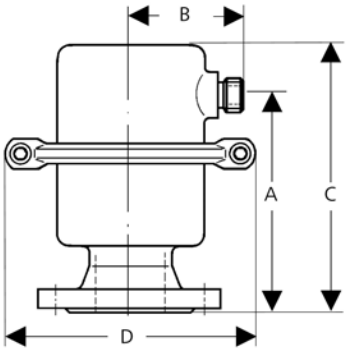
EB 1.12 3/4 x 1/2



EB 1.12 G 1 - 2, DN 25 - 50



EB 1.12 DN 65 - 100



Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.12

Compact Standard Bleeding Valve

Flow Rate [Nm^3/h] G 3/4 x 1/2A			
Δp bar	pressure range bar *		
	0 - 2	0 - 6	0 - 16
0.1	3.1	1	0.3
0.2	4.4	1.4	0.4
0.5	6.8	2.2	0.6
1	8.6	2.8	0.7
2	12	4.2	1
4		7	1.7
6		9.8	2,4
8			3.1
10			3.8
12			4.5
16			5.9

Flow Rate [Nm^3/h] G 1 - 2 x 3/4A, DN 25 - 50 x 3/4A				
Δp bar	pressure range bar *			
	0 - 2	0 - 6	0 - 10	0 - 16
0.1	14	6.4	4.1	3.1
0.2	20	9	5.7	4.4
0.5	31	13	8.9	6.8
1	39	17	11	8.6
2	59	26	16	12
4		44	28	21
6		61	39	30
8			50	38
10			62	47
12				53
16				73

Flow Rate [Nm^3/h] DN 65 - 100 x 3/4A				
Δp bar	pressure range bar *			
	0 - 2	0 - 6	0 - 10	0 - 16
0.1	25	25	16	8
0.2	36	36	23	11
0.5	55	55	35	16
1	70	70	45	21
2	106	106	67	32
4		176	113	53
6		246	157	75
8			203	96
10			248	118
12				139
16				182

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

The quoted flow volumes apply to a fully open valve i.e. in start-up condition at 0 °C and 1013 mbar. With continuous bleeding e.g. of filter vessels, the maximum flow volume is 30 % less on average.

* Please note: Smaller seat diameter for higher pressure range. If the selected working pressure range is too high, the flow volume may be inadequate.

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.20

Large Sized Cast Bleeding and Venting Valve

Technical Data

Connection DN	80/65 - 200/150
Nominal Pressure PN	16 - 40
Operating Pressure	0 - 40 bar
Flow Rate	7770 Nm^3/h
Temperature	200 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

The EB 1.20 bleeding/venting valves are float-controlled robust valves made of spherical-graphite cast iron or cast steel to handle large air volumes e.g. in sand filters. The internal components are made of made of Cr/CrNiMo-steel/red brass and the float is made of CrNiMo-steel. Up to 130 °C the valve cone is fitted with a soft seal; up to 200 °C the seal is metallic.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Valves for continuous bleeding must not be overdimensioned. If a larger valve size is selected, a higher working pressure range with a correspondingly lower flow volume should be chosen. In case of doubt we shall be happy to advise you.

On filter vessels the bleed connection is often located in the middle of the vessel. If the flow volume is large and the distance between distribution funnel and bleed connection small, the incoming water jet hits the bleed connection. This will impair the efficiency of the bleed valve and can result in water hammer. This problem may be avoided by installing a baffle or by placing the bleed connection away from the centre.

Options

- manual bleed valve made of stainless steel (CrNiMo steel)
- rubber or plastic coating for corrosive fluids
- non-return valve to prevent venting
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]									
PN 16	0 - 2	0 - 4	0 - 8	0 - 13	0 - 16				
PN 25	0 - 2	0 - 4	0 - 8	0 - 13	0 - 16	0 - 22	0 - 25		
PN 40	0 - 2	0 - 4	0 - 8	0 - 13	0 - 16	0 - 22	0 - 25	0 - 32	0 - 40

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.20

Large Sized Cast Bleeding and Venting Valve

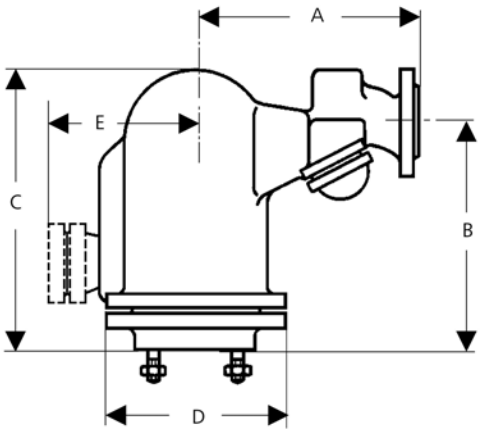
Materials			
Temperature		130 °C	200 °C
Body	PN 16	spherodial cast iron	spherodial cast iron
	PN 25/40	cast steel	cast steel
Body Seal		Nova Universal	Nova Universal
Internals		Cr / CrNiMo-steel / Rg	Cr / CrNiMo-steel / Rg
Float		CrNiMo-steel	CrNiMo-steel
Valve Seal		EPDM	metallic

Dimensions [mm]				
size	nominal diameter DN			
	80/65	100/80	125/100	200/150
A	460	455	500	715
B	445	425	465	735
C	550	525	580	875
øD	285	365	380	520
E	220	-	-	-

Weights [kg]				
nom. press.	nominal diameter DN			
PN	80/65	100/80	125/100	200/150
16	76	95	130	280

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.20

Large Sized Cast Bleeding and Venting Valve

Seat Diameter [mm]				
pressure range bar	nominal diameter DN			
	80/65	100/80	125/100	200/150
0 - 2	30	40	50	78
0 - 4	24	32	40	61
0 - 8	20	24	30	46
0 - 13	16	20	24	36
0 - 16	14	18	22	36
0 - 22	12	14	16	
0 - 25	10	12	14	
0 - 32	9	9		
0 - 40	8	8		

Air Flow Rate [Nm³/h] up to Δp 10 bar								
seat ø mm	differential pressure Δp bar							
	0.1	0.5	1	2	4	6	8	10
8	16	35	45	67	113	157	203	248
9	21	45	57	85	143	200	258	315
10	25	55	70	106	176	246	317	388
12	37	80	102	152	254	355	457	559
14	50	109	138	207	346	484	621	760
16	66	143	180	270	451	630	811	992
18	84	181	228	342	571	800	1028	1255
20	103	224	282	424	705	988	1270	1550
22	128	256	342	513	855	1197	1540	1880
24	148	321	406	610	1020	1420	1830	2240
28	205	417	556	834	1390	1950	2500	3060
30	233	503	635	953	1590	2220	2860	
32	264	570	721	1080	1800			
36	360	678	914	1370	2285	4000	4113	5027
40	415	895	1130	1690	2820			
46	564	1170	1490	2235	3425	5215	6705	
50	646	1392	1760	2640				
61	992	2070	2624	3956	6555			
78	1517	3400	4290	6430				

Air Flow Rate [Nm³/h] from Δp 12 bar								
seat ø mm	differential pressure Δp bar							
	12	13	16	22	25	32	35	40
8	293	315	383	518	584	743	810	923
9	372	400	486	658	742	943		
10	459	494	599	810	916			
12	661	711	864	1170	1318			
14	900	967	1175	1590	1796			
16	1170	1260	1530					
18	1485	1595	1940					
20	1833	1975						
22	2225	2395	2900					
24	2640	2845						
28	3600	3890	4315					
30								
32								
36	5940	6400	7770					

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

The quoted flow volumes apply to a fully open valve i.e. in start-up condition at 0 °C and 1013 mbar. With continuous bleeding e.g. of filter vessels, the maximum flow volume is 30 % less on average.

* Please note: Smaller seat diameter for higher pressure range.
If the selected working pressure range is too high, the flow volume may be inadequate.

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.32

Compact Standard Bleeding Valve

Technical Data

Connection G	3/4 x 1/2A
Nominal Pressure PN	16
Operating Pressure	0 - 16
Flow Rate	5,9 m^3/h
Temperature	130 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

The EB 1.32 bleeding/venting valves are compact and lightweight float-controlled valves for water treatment (incl. ozone), pipelines, petrol tanks etc. They are manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Valves for continuous bleeding must not be overdimensioned. If a larger valve size is selected, a higher working pressure range with a correspondingly lower flow volume should be chosen. In case of doubt we shall be happy to advise you.

On filter vessels the bleed connection is often located in the middle of the vessel. If the flow volume is large and the distance between distribution funnel and bleed connection small, the incoming water jet hits the bleed connection. This will impair the efficiency of the bleed valve and can result in water hammer. This problem may be avoided by installing a baffle or by placing the bleed connection away from the centre.

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» ozone-resistant design
» various seal materials suitable for your medium
» plastic coating for corrosive fluids
» non-return valve to prevent venting
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]		
0 - 2	0 - 6	0 - 16

Flow Rate [Nm^3/h]			
Δp bar	pressure range bar *		
	0 - 2	0 - 6	0 - 16
0.1	3.1	1	0.3
0.2	4.4	1.4	0.4
0.5	6.8	2.2	0.6
1	8.6	2.8	0.7
2	12	4.2	1
4		7	1.7
6		9.8	2.4
8			3.1
10			3.8
12			4.5
16			5.9

The quoted flow volumes apply to a fully open valve i.e. in start-up condition at 0 °C and 1013 mbar. With continuous bleeding e.g. of filter vessels, the maximum flow volume is 30 % less on average.

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.32

Compact Standard Bleeding Valve

Materials		
Design	standard	ozone resistant
Temperature	130 °C	80°C
Body	CrNiMo-steel	CrNiMo-steel
Body Seal	EPDM	FPM
Internals	CrNiMo-steel	CrNiMo-steel
Float	CrNiMo-steel	CrNiMo-steel
Valve Seal	FPM	CSM
Profile Clamp	CrNiMo-steel	CrNiMo-steel

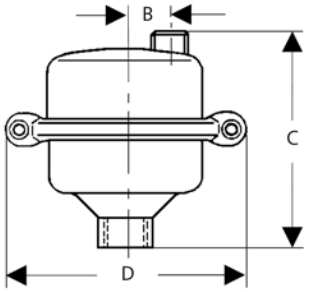
Dimensions[mm]	
Size	inlet female G 3/4, outlet male G 1/2 A
B	27
C	135
D	140

size A tolerance ± 4 mm

Weights [kg]
0.8

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.48

Bleeding and Venting Valve with sight glass

Technical Data

Connection G	1/2
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
Flow Rate	28 Nm³/h
Temperature	130 °C
Medium	Liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

The bleeding and venting valves EB 1.48 are float-controlled, compact and lightweight devices for water treatment (also ozone), pipelines, fuel tanks etc. The valves are made of deep-drawn stainless steel featuring a high corrosion resistance. The valve cone is provided with a soft seal. The function can be viewed through the sight glass.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Please state working pressure range when enquiring or ordering.

Standard

» completely made of CrNiMo-steel
» large soda lime glass

Options

» ozone-resistant design
» enhanced float for density < 900 kg/m³
» various seal materials suitable for your medium
» manual bleed valve for function control
» Maxos sight glass
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]				
0 - 2	0 - 4	0 - 6	0 - 10	0 - 16

Flow Rate [Nm³/h]					
Δp bar	pressure range bar				
	0 - 2	0 - 4	0 - 6	0 - 10	0 - 16
0.1	4.2	2.7	1.5	0.7	0.38
0.5	9.5	6.1	3.5	1.5	0.85
1	17.6	11.3	6.3	2.8	1.5
2	26.4	16.9	9.5	4.2	2.3
4		28	15.9	7	4
6			22.2	9.8	5.5
8				12.7	7.1
10				15.5	8.7
12					10.3
16					13.4

Bleeding and Venting Valves

Continuous Bleeding and Venting Valves EB 1.48

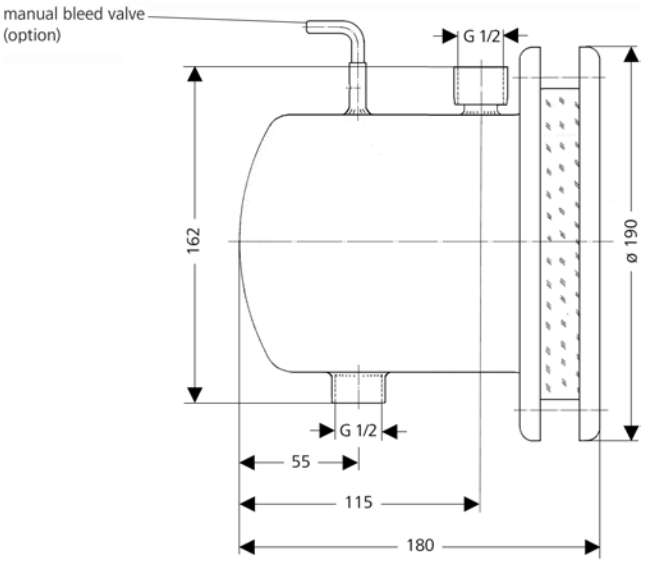
Bleeding and Venting Valve with sight glass

Materials	
Body	CrNiMo-steel
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	EPDM
Body Seal	Nova-Universal
Sight Glass	soda lime glass

Weight [kg]
4.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Startup Bleeding and Venting Valves

Valve for Very Large Air Volumes			EB 3.50
float-controlled startup bleeding valve for high operating pressures, special designs available with adapted continuous bleeding and venting valve (EB 6.54) | usable for nearly all liquids | body made of steel, CrNiMo-steel | high-pressure-resistant welded construction | long operational lifespan, extremely sturdy, available in special materials			
DN	100 - 300	PN	40
Q	10708 Nm^3/h	T	130 °C

for minimal closing pressure			EB 3.51
float-controlled startup venting valve, also closes with minimal system pressure | suitable for nearly all liquids | completely made of deep-drawn CrNiMo-steel, surface finish of the body Ra ≤ 1,6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, available in special materials such as seawater-resistant stainless steels – highest effectiveness with compact design			
DN	25 - 100	PN	16
p	up to 16 bar	Q	1070 Nm^3/h
T	80 °C		

Universal Valve			EB 3.52
float-controlled startup bleeding valve | usable for all liquids | completely made of deep-drawn CrNiMosteel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, available in special materials – such as seawater resistant stainless steels – highest effectiveness with compact design			
DN	25 - 100	PN	16
p	0 - 13 bar	Q	1935 Nm^3/h
T	130 °C		

Know How Bleeding and Venting Valves

Bleeding and venting valves remove or admit air or gases automatically from/to tanks, vessels or pipelines. They are float-controlled valves which close as the liquid level rises and open as the level falls.

Operation
A rising liquid level lifts the float and closes the valve, in most cases via a system of levers. If the liquid level drops because air is entering the system or the plant is being started up, the valve will open and either admit air or vent the air from the system.

Start-up bleeding and venting valves
are used to vent low-pressure plant systems when such systems are started up or filled. The float acts directly on the cone. They have a large seat diameter to ensure fast venting for pressures below 0.1 bar. During operation these valves are kept closed by the internal system pressure. A suddenly occurring vacuum causes them to open and equalise the pressure. This prevents damage which a vacuum may cause.

Continuous vent valves
are used to remove air which accumulates as the plant operates. They incorporate a lever system which enables them to operate at very low and high pressures.
A non-return valve can be fitted to the outlet side of these valves to prevent air entering the system. In this case they are pure vent valves, no air enters the system.

Combined Bleeding and Venting Valves
are combined start-up and continuous bleed/venting valves. They have a large seat for start-up operation and a small seat for continuous operation, which are controlled by a float via a system of levers. Both valve seats are open while the system is being filled. During system operation the large seat is kept closed by the internal pressure. Any accumulating small air volumes are vented from the system via the small valve seat. If the pressure drops below 0.1 bar the large valve seat can open again. If a vacuum occurs which may be caused, for instance, by a pump failure, the large seat opens instantaneously and prevents damage.
If subsequently a pressure surge runs back through the pipeline, the large seat closes causing the air volume which has entered the system to act as a damper while escaping to atmosphere through the small seat.

Elastomers and coatings
Standard valves can be used for water up to 80 °C, in certain cases up to 130 °C, higher temperatures with special types.
For ozone we supply a special version fitted with special elastomers. For hydrocarbons like petrol, gasoline etc. we use FPM. For hot mineral water, sea water and other liquids containing chloride we supply valves that feature coated bodies and internal components. For corrosive media we supply rubber-coated valves. In addition we can supply special valves manufactured from high-molybdenum materials.
Please note that our stainless steel venting valves are in most cases cheaper than equivalent cast iron valves.

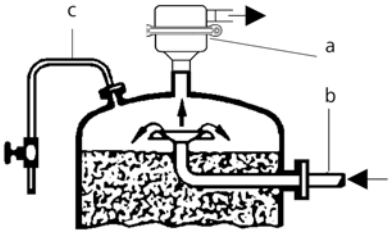
Operating pressure range
You should select an operating pressure range which covers the maximum pressure that may occur, as otherwise the vent valve will not open. You should select the type and size of vent valve according to the air volume to be removed at operating pressure. You will find the appropriate tables in the data sheets. The throughput capacities given in these tables apply to a fully open valve i.e. when the system is started up or as long as the liquid level remains below the vent valve inlet. For steady and continuous venting, e.g. of filter vessels, the throughput capacity should be reduced by approximately 30%.
To ensure smooth operation and long life, continuous vent valves should not be overdimensioned. If the throughput capacity is excessive for a given nominal diameter, a higher operating pressure coupled with a correspondingly lower throughput may provide the solution.

Installation
Vent valves should always be installed at high points in pipelines or vessels. Do not install vent valves on standpipes or in flushing lines but at those points where air accumulates. Select a pipe run where the flow velocity is reduced and, if required, install a vent dome. You should choose an installation site where the vent valve is not likely to "hammer" and thereby get damaged.

During venting slugs of water must not be carried over and enter the valve body at high speed. If you are in doubt you should install a baffle or deflector.
Please make sure that the cross-sectional area of the tank outlet is not less than that of the vent valve inlet.
Under certain conditions (steam, foaming, very high flow velocity, contamination) a vent valve may "spit" i.e. discharge a small quantity of water when closing. For this reason it is recommended to fit a blow-off line to the outlet of the valve, if required.
In the case of large air capacities, great turbulence, two-phase mixed media or side-mounting of the valve because of restricted headroom above the tank, a pipeline should be installed between the bleed valve cover and the highest point of the tank (i.e. a balancing line such as is used with level control valves). For this purpose the bleed valve cover must be fitted with an additional connector.

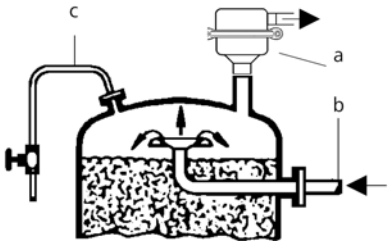
Example for insatllation on a filter vessel

Picture 1: wrong, in center



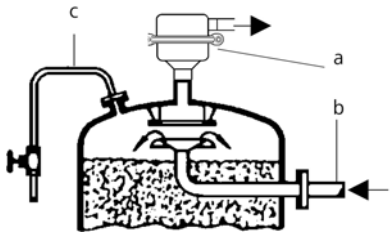
a = Bleeding/venting valve b = Water supply c = Vent line

Picture 2: right, off-centre



a = Bleeding/venting valve b = Water supply c = Vent line

Picture 3: right, with deflector



a = Bleeding/venting valve b = Water supply c = Vent line

Know How Bleeding and Venting Valves

Bleeding and venting valves remove or admit air or gases automatically from/to tanks, vessels or pipelines. They are float-controlled valves which close as the liquid level rises and open as the level falls.

Pollution
If you have polluted liquids and the vent valve must be cleaned from time to time, please, install a stop valve between tank, vessel resp. pipeline and vent valve. This is not necessary if the equipment to be vented can be simple depressurized.

Operation
Pressure surges or water hammer can destroy a float. For this reason suitable protective devices should be installed in the system.
With foaming media and their reduced specific density, bleeding/venting valves cannot operate reliably. For such applications we strongly recommend the installation of a smoothing vessel. In such cases our bleeding/venting valves type EB 1.11 and EB 1.84 may be used.

Maintenance
Pressure reducers must be cleaned and serviced regularly, especially in the case of liquids containing compounds which tend to form deposits such as iron or lime.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, Operating Instruction etc. MUST be followed.

Selection Bleeding and Venting Valves

start-up bleeding and venting valves

max. inlet press. bar	T °C	Q at 6 bar m^3/h air	Q max m^3/h air	connection G	connection DN	*	SS	notes	type
16	80		1070		50- 100	*	•	start-up vent valve for minimal closing pressure	3.51
16	130		1935		25 - 100	*	•	economical start-up vent valve	3.52
16 - 40	80		18550		100-300	*		start-up vent valve for large capacities	3.50

* other connections available, •stainless steel deep drawn

flow rates are valid for dry air with 0°C and 1,01325 bar

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Bleeding and Venting Valves

Startup Bleeding and Venting Valves EB 3.50

Valve for Very Large Air Volumes

Technical Data

Connection DN	100 - 300
Nominal Pressure PN	40
Flow Rate	10708 Nm^3/h
Temperature	130 °C
Medium	liquids

Description

Start-up bleed valves remove air or gases from systems or pipelines during the filling process without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a commercial check valve to the outlet.

Thanks to the large cross-sectional area of the seat these valves are capable of handling large air volumes at low pressures. They close as soon as the system is filled with fluid. When the liquid level drops these valves will only open if the system is depressurised; they will not open under working pressure.

EB 3.50 is a float-controlled start-up bleed valve. Its body is made of steel whilst the internal components are manufactured from stainless steel featuring excellent corrosion resistance. The float is precisely guided in the outlet spigot. The valve cone is fitted with a soft seal. The minimum pressure required fro valve sealing is 0.3 bar. If small air volumes have to be bled during continuous operation, a dual bleed valve should be used.

Options

- special version up to 200 °C
- nominal diameter DN 25 - 80
- various seal materials suitable for your medium
- rubber or plastic coating for corrosive fluids
- non-return valve to prevent venting
- special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Start-up Bleeding Air Flow Rate [Nm^3/h] bei 0 °C, 1013 mbar

Δp bar	nominal diameter DN					
	100	125	150	200	250	300
0,05	971	1604	2236	3948	5783	7572
0,1	1374	2268	3162	5583	8178	10708
0,2	1940	3210	4470	7900	11570	15150
0,3	2380	3930	5480	9670	14165	18550

Venting Air Flow Rate [Nm^3/h] bei 0 °C, 1013 mbar

Δp bar	nominal diameter DN					
	100	125	150	200	250	300
0,1	1300	2150	3000	5300	7760	10160
0,2	1740	2870	4000	7060	10345	13545
0,3	1990	3290	4580	8090	11850	15520
0,4	2130	3515	4900	8650	12670	16590

Bleeding and Venting Valves

Startup Bleeding and Venting Valves EB 3.50

Valve for Very Large Air Volumes

Materials	
Body	steel
Body Seal	Nova Universal
Internals	CrNi-steel, CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	EPDM

Dimensions [mm]

PN	size	nominal diameter DN					
		100	125	150	200	250	300
6	A	620	620	750	860	1010	1030
	D	440	440	540	645	755	755
10	A	625	625	760	870	1020	1050
	D	445	445	565	670	780	780
16	A	625	625	760	870	1020	1060
	D	460	460	580	715	840	840
25	A	650	650	790	910	-	-
	D	485	485	620	730	-	-
40	A	650	650	790	930	-	-
	D	515	515	660	755	-	-

Weights [kg]

PN	nominal diameter DN					
	100	125	150	200	250	300
6	70	73	on request			
10	70	73				
16	81	84				
25	110	115				
40	165	170				

Special designs on request.
The pressure has always been indicated as overpressure.
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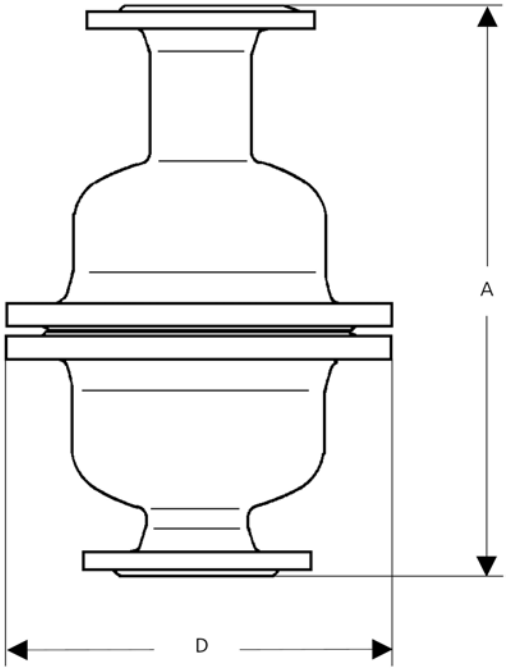
Dimensional Drawing



Bleeding and Venting Valves

Startup Bleeding and Venting Valves EB 3.51

for minimal closing pressure

Technical Data

Connection DN	25 - 100
Nominal Pressure PN	16
Operating Pressure	up to 16 bar
Flow Rate	1070 Nm^3/h
Temperature	80 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves.

Owing to their large seat cross section, the valves are suitable for discharging large air quantities at low pressures. They close when filled with the fluid. With the level falling, the valve will only open if the pressure is relieved simultaneously, it does not open under operating pressure.

EB 3.51 is a float-controlled start-up bleeding valve. It is completely made of deep-drawn stainless steel parts featuring excellent corrosion resistance. The float is exactly guided in the inlet connection. The valve seat is of the soft seal type. The minimum pressure for the valve seal amounts only 0,05 bar.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Standard

» all stainless steel construction
» degassing bend
» quick-release body clamp ring

Options

» cap with insect protection
» outlet with flange connection

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Start-up Bleeding Air Flow Rate [Nm^3/h] at 0 °C, 1013 mbar

Δp bar	nominal diamter DN						
	25	32	40	50	65	80	100
0.05	100	170	220	350	430	430	430
0.1	130	240	320	500	620	620	620
0.2	190	330	450	710	870	870	870
0.3	230	410	550	870	1070	1070	1070

Venting Air Flow Rate [Nm^3/h] at 0 °C, 1013 mbar

Δp bar	nominal diameter DN						
	25	32	40	50	65	80	100
0.1	130	220	300	470	580	580	580
0.2	170	300	400	630	780	780	780
0.3	200	340	460	720	900	900	900
0.4	210	360	490	770	950	950	950

Bleeding and Venting Valves

Startup Bleeding and Venting Valves EB 3.51

for minimal closing pressure

Materials	
Body	CrNiMo-steel
Body Sealing	EPDM
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	NBR
Profile Clamp	CrNiMo-steel

Dimensions [mm] with Degassing Bend							
size	nominal diameter DN						
	25	32	40	50	65	80	100
A	300	301	303	300	296	300	300
AE	57	57	57	83	83	83	83
D	200	200	200	200	200	200	200
F	1 1/2	1 1/2	1 1/2	2 1/2	2 1/2	2 1/2	2 1/2

Weights [kg] with Degassing Bend						
nominal diameter DN						
25	32	40	50	65	80	100
5.1	5.7	6	6	5.4	7.4	7.9

Dimensions[mm] with Protection Cap							
size	nominal diameter DN						
	25	32	40	50	65	80	100
A	255	257	260	258	254	260	260
D	200	200	200	200	200	200	200

Weights [kg] with Protection Cap						
nominal diameter DN						
25	32	40	50	65	80	100
5.5	6.1	6.4	6.8	7.2	8.3	8.8

Dimensions [mm] with outlet flange							
size	nominal diameter DN						
	25	32	40	50	65	80	100
A	272	276	281	280	233	238	238
D	200	200	200	200	200	200	200

Weights [kg] with outlet flange						
nominal diameter DN						
25	32	40	50	65	80	100
5,6	6,8	7,3	8,1	8,5	10,4	12,0

Special designs on request.
The pressure has always been indicated as overpressure.
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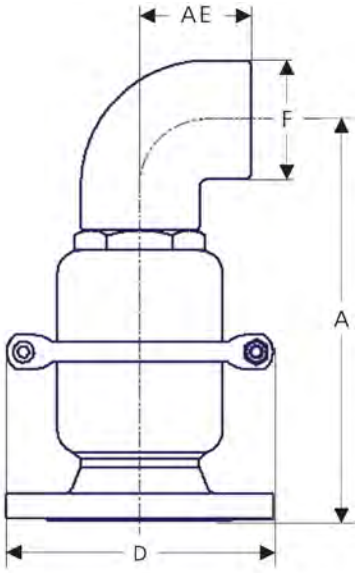
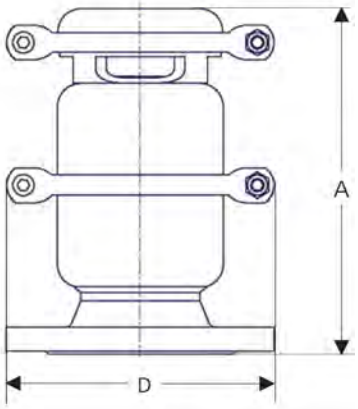
Dimensional Drawing

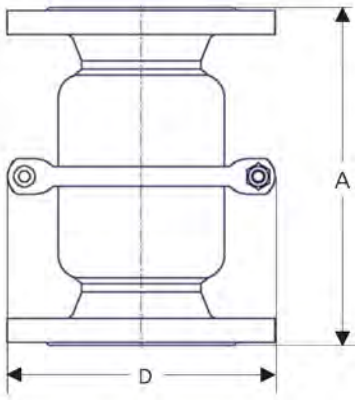
degassing bend



protection cap



outlet flange



Bleeding and Venting Valves

Startup Bleeding and Venting Valves EB 3.52

Universal Valve

Technical Data

Connection DN	25 - 100
Nominal Pressure PN	16
Operating Pressure	0 - 13 bar
Flow Rate	1935 Nm^3/h
Temperature	130 °C
Medium	liquids

Description

Start-up bleed valves remove air or gases from systems or pipelines during the filling process without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a commercial check valve to the outlet.

Thanks to the large cross-sectional area of the seat these valves are capable of handling large air volumes at low pressures. They close as soon as the system is filled with fluid. When the liquid level drops these valves will only open if the system is depressurised; they will not open under working pressure.

EB 3.52 is a float-controlled start-up bleed valve manufactured completely from deep-drawn stainless steel components featuring excellent corrosion resistance. The float is precisely guided in the outlet spigot. The valve cone is fitted with a soft seal. The minimum pressure required for valve sealing is 0.3 bar.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» working pressure up to 16 bar
» various seal materials suitable for your medium
» plastic coating for corrosive fluids
» non-return valve to prevent venting
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Start-up Bleeding Air Flow Rate [Nm^3/h] at 0 °C, 1013 mbar

Δp bar	nominal diameter DN						
	25	32	40	50	65	80	100
0,05	52	90	125	217	378	543	790
0,1	73	126	177	307	534	767	1117
0,2	104	178	250	435	755	1085	1580
0,3	127	219	306	532	925	1330	1935

Venting Air Flow Rate [Nm^3/h] at 0 °C, 1013 mbar

Δp bar	nominal diameter DN						
	25	32	40	50	65	80	100
0,1	69	120	167	291	507	728	1060
0,2	93	160	223	390	675	970	1410
0,3	106	183	255	445	775	1110	1620
0,4	114	195	275	475	825	1185	1730

Bleeding and Venting Valves

Startup Bleeding and Venting Valves EB 3.52

Universal Valve

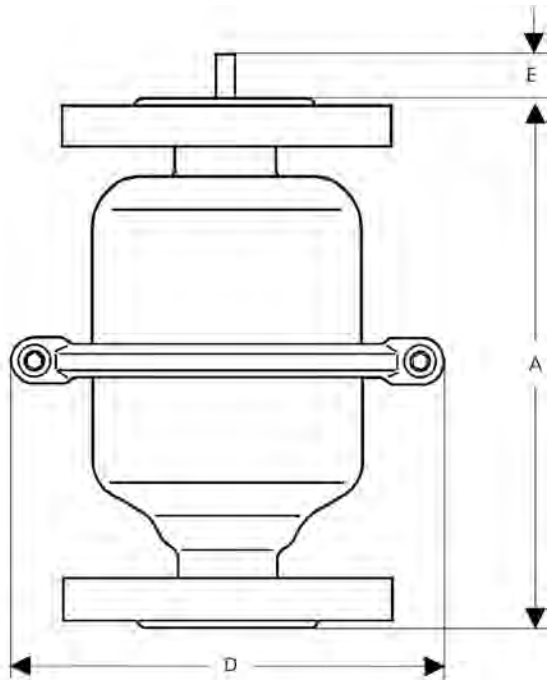
Materials	
Body	CrNiMo-steel
Body Seal	EPDM
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	EPDM
Profile Clamp	CrNiMo-steel

Dimensions [mm]							
size	nominal diameter DN						
	25	32	40	50	65	80	100
A	247	255	257	261	430	440	440
D	200	200	200	200	265	265	265
E	45	45	35	35	-	-	-

Weights [kg]						
nominal diameter DN						
25	32	40	50	65	80	100
4.5	6	6.5	8.5	15	16	18

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Combined Bleeding and Venting Valves

with integrated vacuum breaker			EB 1.57
for plants subject to severe vacuum hazards and systems particularly requiring ventilation | float and lever ensure the discharge of large gas quantities for constant ventilation at maximum operating pressure | the adjustable vacuum breaker with large nominal diameter ensures maximum ventilation performance during draining of systems and means optimal dual functionality | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact			
DN	100	PN	10
p	0 - 10	Q	190 Nm³/h
T	130 °C		

Valve with Integrated Vacuum Breaker			EB 1.59
for plants subject to vacuum hazards, float and lever control the valve shut-off to discharge gas with the additional vacuum breaker function by means of a spring-controlled rubber ball in the large valve seat | usable for water and fuel | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosion-resistant, very lightweight and compact owing to the clamp system			
DN	100	PN	10
p	0 - 10 bar	Q	62 Nm³/h
T	60 °C		

Combined Valve Especially for Water			EB 1.74
for large air volumes at startup, continuous bleeding or venting under pressure, opens with large ventilation capacity if a vacuum is present | suitable for nearly all liquids | completely made of deep-drawn CrNiMosteel (316L) – surface finish of the body Ra ≤ 1.6 µm | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, easy-to-maintain owing to the clamp system – highest effectiveness with compact design			
DN	50 - 150	PN	16
p	0 - 8 bar	Q	1783 Nm³/h
T	130 °C		

Epoxy-coated Cast Valve for water			EB 1.75
large bleeding or ventilation quantities owing to ventilation cross sections and connection flange dimensions of the same size | body made of GGG-50 with KTW-compliant epoxy coating | bleeding under operating pressure, max. bleeding performance in the start-up mode and max. ventilation performance during draining of systems means optimal triple functionality | optionally with anti-shock device for suppression of water hammers			
DN	50 - 200	G	1 + 2
PN	16 - 40	p	0.3 - 40 bar
Q	venting up to 7600 Nm³/h bleeding up to 6100 Nm³/h Working venting up to 33 Nm³/h	T	60 °C

Combined Valve for Dirty or Waste Water			EB 1.84
for large air volumes at startup, continuous bleeding or venting under pressure, opens immediately if a vacuum is present | usable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosionresistant, very lightweight and compact | long operational lifespan, manageable installation, extremely reliable – highest effectiveness with compact design | optimal triple functionality			
DN	50 - 150	PN	10 - 16
p	0 - 16 bar	Q	1.100 Nm³/h
T	130 °C		

Bleeding and Venting Valves

Combined Bleeding and Venting Valves

Epoxy-coated Cast Valve for Waste Water			EB 1.85
optimised body design with guided float to ensure maximal protection of the bleeding and venting device | large bleeding or ventilation quantities owing to ventilation cross sections and connection flange dimensions of the same size | body made of GGG-50 with KTW-compliant epoxy coating | bleeding at operating pressure, max. bleeding performance in the startup mode and max. ventilation performance during draining of systems | optionally with anti-shock device for suppression of water hammers			
DN	50 - 200	G	2
PN	10 - 16	p	0.3 - 16 bar
Q	venting up to 4200 Nm^3/h bleeding up to 4100 Nm^3/h working venting up to 32 Nm^3/h	T	70 °C

Valve for highest Flow Rates			EB 6.54
suitable for high operational pressures | large bleed air volumes during startup, large vent air volumes during bleeding | bleeding under pressure owing to adapted continuous venting valve | avoids cavitation peaks | suitable for all liquid media, also for petrol, oil and chemicals | body made of steel, CrNiMo-steel, massive welded construction, extremely sturdy, also available in seawater-resistant materials | optimal triple functionality			
DN	25 - 300	PN	6 - 40
p	0,3 - 40 bar	Q	18550 Nm^3/h
T	130 °C		

Know How Bleed and Venting Valves

Bleeding and venting valves remove or admit air or gases automatically from/to tanks, vessels or pipelines. They are float-controlled valves which close as the liquid level rises and open as the level falls.

Operation
A rising liquid level lifts the float and closes the valve, in most cases via a system of levers. If the liquid level drops because air is entering the system or the plant is being started up, the valve will open and either admit air or vent the air from the system.

Start-up bleeding and venting valves
are used to vent low-pressure plant systems when such systems are started up or filled. The float acts directly on the cone. They have a large seat diameter to ensure fast venting for pressures below 0.1 bar. During operation these valves are kept closed by the internal system pressure. A suddenly occurring vacuum causes them to open and equalise the pressure. This prevents damage which a vacuum may cause.

Continuous vent valves
are used to remove air which accumulates as the plant operates. They incorporate a lever system which enables them to operate at very low and high pressures.
A non-return valve can be fitted to the outlet side of these valves to prevent air entering the system. In this case they are pure vent valves, no air enters the system.

Combined Bleeding and Venting Valves
are combined start-up and continuous bleed/venting valves. They have a large seat for start-up operation and a small seat for continuous operation, which are controlled by a float via a system of levers. Both valve seats are open while the system is being filled. During system operation the large seat is kept closed by the internal pressure. Any accumulating small air volumes are vented from the system via the small valve seat. If the pressure drops below 0.1 bar the large valve seat can open again. If a vacuum occurs which may be caused, for instance, by a pump failure, the large seat opens instantaneously and prevents damage.
If subsequently a pressure surge runs back through the pipeline, the large seat closes causing the air volume which has entered the system to act as a damper while escaping to atmosphere through the small seat.

Elastomers and coatings
Standard valves can be used for water up to 80 °C, in certain cases up to 130 °C, higher temperatures with special types.
For ozone we supply a special version fitted with special elastomers. For hydrocarbons like petrol, gasoline etc. we use FPM. For hot mineral water, sea water and other liquids containing chloride we supply valves that feature coated bodies and internal components. For corrosive media we supply rubber-coated valves. In addition we can supply special valves manufactured from high-molybdenum materials.
Please note that our stainless steel venting valves are in most cases cheaper than equivalent cast iron valves.

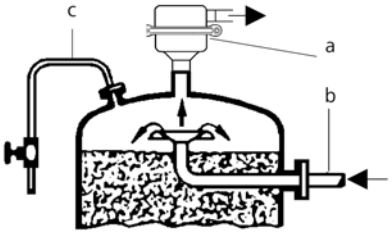
Operating pressure range
You should select an operating pressure range which covers the maximum pressure that may occur, as otherwise the vent valve will not open. You should select the type and size of vent valve according to the air volume to be removed at operating pressure. You will find the appropriate tables in the data sheets. The throughput capacities given in these tables apply to a fully open valve i.e. when the system is started up or as long as the liquid level remains below the vent valve inlet. For steady and continuous venting, e.g. of filter vessels, the throughput capacity should be reduced by approximately 30%.
To ensure smooth operation and long life, continuous vent valves should not be overdimensioned. If the throughput capacity is excessive for a given nominal diameter, a higher operating pressure coupled with a correspondingly lower throughput may provide the solution.

Installation
Vent valves should always be installed at high points in pipelines or vessels. Do not install vent valves on standpipes or in flushing lines but at those points where air accumulates. Select a pipe run where the flow velocity is reduced and, if required, install a vent dome. You should choose an installation site where the vent valve is not likely to "hammer" and thereby get damaged.

During venting slugs of water must not be carried over and enter the valve body at high speed. If you are in doubt you should install a baffle or deflector.
Please make sure that the cross-sectional area of the tank outlet is not less than that of the vent valve inlet.
Under certain conditions (steam, foaming, very high flow velocity, contamination) a vent valve may "spit" i.e. discharge a small quantity of water when closing. For this reason it is recommended to fit a blow-off line to the outlet of the valve, if required.
In the case of large air capacities, great turbulence, two-phase mixed media or side-mounting of the valve because of restricted headroom above the tank, a pipeline should be installed between the bleed valve cover and the highest point of the tank (i.e. a balancing line such as is used with level control valves). For this purpose the bleed valve cover must be fitted with an additional connector.

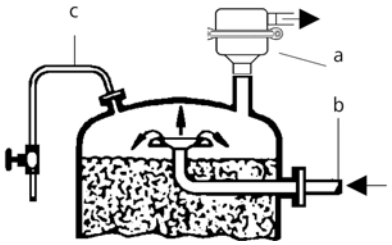
Example for installation on a filter vessel

Picture 1: wrong, in center



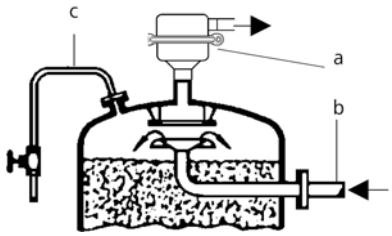
a = Bleeding/venting valve b = Water supply c = Vent line

Picture 2: right, off-centre



a = Bleeding/venting valve b = Water supply c = Vent line

Picture 3: right, with deflector



a = Bleeding/venting valve b = Water supply c = Vent line

Know How Bleed and Venting Valves

Bleeding and venting valves remove or admit air or gases automatically from/to tanks, vessels or pipelines. They are float-controlled valves which close as the liquid level rises and open as the level falls.

Pollution
If you have polluted liquids and the vent valve must be cleaned from time to time, please, install a stop valve between tank, vessel resp. pipeline and vent valve. This is not necessary if the equipment to be vented can be simple depressurized.

Operation
Pressure surges or water hammer can destroy a float. For this reason suitable protective devices should be installed in the system.
With foaming media and their reduced specific density, bleeding/venting valves cannot operate reliably. For such applications we strongly recommend the installation of a smoothing vessel. In such cases our bleeding/venting valves type EB 1.11 and EB 1.84 may be used.

Maintenance
Pressure reducers must be cleaned and serviced regularly, especially in the case of liquids containing compounds which tend to form deposits such as iron or lime.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, Operating Instruction etc. MUST be followed.

Selection Bleeding and Venting Valves

combined bleeding and venting valves

max. inlet press. bar	T °C	Q at 0,1 bar Nm³/h air	Q at 6 bar Nm³/h air	venting Nm³/h air	connection G	connection DN	connection *	SS	notes	type
10	40	560	88	870		50 - 100	*	•	completely made of CrNiMo steel, for waste water	1.84
16	130	1030	209	1595		50 - 150	*	•	completely made of CrNiMo steel, also closes in depressurized state	1.74
16	70	2300	18	4100		50 - 100			epoxy-coated cast valve for waste water	1.85
25	70	4200	10	6100		50 - 200			epoxy-coated cast valve for water	1.75
25	130	10708	9,8	13550		50 - 300	*	•	for highest flow rates during start-up and bleeding	6.54

combined bleeding and venting valves with integrated vacuum breaker

max. inlet press. bar	T °C	Q at 6 bar Nm³/h air	venting Nm³/h air	connection G	connection DN	connection *	SS	notes	type
10	60	61	223		100	*	•	vacuum breaker with soft seal ball	1.59
10	130	121	1500		100	*	•	adjustable vacuum breaker, especially high ventilation performance	1.57

* other connections available, •stainless steel deep drawn

flow rates are valid for dry air with 0°C and 1,01325 bar

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.57

with integrated vacuum breaker

Technical Data

Connection DN	100
Nominal Pressure PN	10
Operating Pressure	0 - 10
Flow Rate	190 Nm^3/h
Temperature	130 °C
Medium	liquids

Description

Bleeding and venting valves exhaust air or gases from plants or pipelines without requiring external power supply. Under working pressure they operate as continuous bleeding valve, when the system is drained they act as venting valve. If, in case of a pump failure, a considerably larger air quantity is to be put in, an additional vacuum breaker with large seat diametre has been integrated. Owing to its very big and adjustable vacuum breaker, the EB 1.57 is particularly suitable for water engineering plants subject to vacuum hazards.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling. The vacuum breaker has been integrated in a similarly easy way.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Valves for continuous bleeding must not be overdimensioned. If a larger valve size is selected, a higher working pressure range with a correspondingly lower flow volume should be chosen. In case of doubt we shall be happy to advise you.

Standard

» all stainless steel construction
» quick-release body clamp ring
» integrated vacuum breaker with large seat diameter, protective cap and screen

Options

» ozone-resistant design
» various seal materials suitable for your medium
» rubber or plastic coating for corrosive fluids
» special connections:
Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Bleeding Flow Rate [Nm^3/h] at 0 °C and 1013 mbar			
Δp bar	pressure range bar *		
	0 - 2	0 - 6	0 - 10
0.1	29	11	8
0.2	41	16	12
0.5	65	25	19
1	119	45	34
2	178	67	51
4		112	86
6		158	121
8			156
10			190

*** Please note:**
Smaller seat diameter for higher pressure range. If the selected working pressure range is too high, the flow volume may be inadequate.

Vacuum Venting [m^3/h] at Δp 0.2 bar
1500

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.57

with integrated vacuum breaker

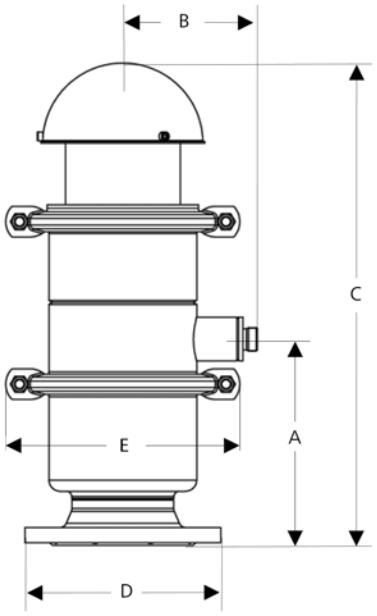
Materials	
Body	CrNiMo-steel
Body Seal	EPDM
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal Bleeding Valve	EPDM
Valve Seal Vacuum Breaker	EPDM
Profile Clamp	CrNiMo-steel

Dimensions [mm]	
size	nominal diameter
	DN 100
A	232
B	151
C	542
D	220
E	263

Wheits [kg]
nominal diameter
DN 100
9

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.59

Valve with Integrated Vacuum Breaker

Technical Data

Connection DN	100
Nominal Pressure PN	10
Operating Pressure	0 - 10 bar
Flow Rate	62 Nm^3/h
Temperature	60 °C
Medium	liquids

Description

If, for instance in the case of a pump failure, much larger quantities of air are fed into the pipe, an additional vacuum breaker with a large seat diameter is integrated. EB 1.59 is therefore particularly suitable for water-technological plants subject to vacuum hazards.

EB 1.59 is a float-controlled venting and bleeding system with preset vacuum bleeding, operating with spring load and cone seal. The valve seats are sealed with soft gaskets. The valve is made completely of deep-drawn stainless steel with outstanding corrosion-resistance qualities and smooth, easy-to-clean surfaces. A robust and frost-proof design for external use.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Valves for continuous bleeding must not be overdimensioned. If a larger valve size is selected, a higher working pressure range with a correspondingly lower flow volume should be chosen. In case of doubt we shall be happy to advise you.

Standard

» all stainless steel construction
» quick-release body clamp ring
» integrated vacuum breaker with large seat diameter and protective cap

Options

» ozone-resistant design
» various seal materials suitable for your medium
» rubber or plastic coating for corrosive fluids
» special connections:
Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Bleeding Flow Rate [Nm^3/h] at 0 °C and 1013 mbar			
Δp bar	pressure range bar *		
	0 - 2	0 - 6	0 - 10
0.1	14	6.4	4.1
0.2	20	9	5.7
0.5	31	13	8.9
1	39	17	11
2	59	26	16
4		44	28
6		61	39
8			50
10			62

*** Please note:**
Smaller seat diameter for higher pressure range. If the selected working pressure range is too high, the flow volume may be inadequate.

Vacuum Venting [m^3/h] at Δp 0,125 bar
223

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.59

Valve with Integrated Vacuum Breaker

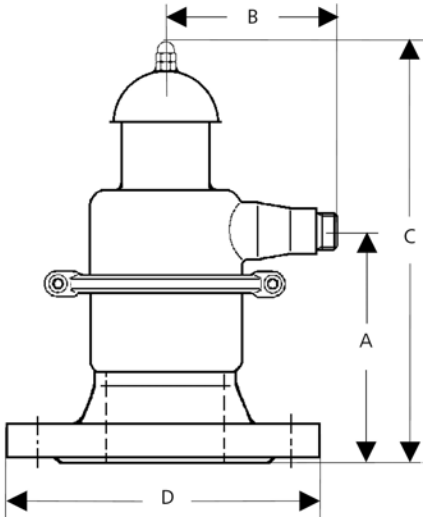
Materials	
Body	CrNiMo-steel
Body Seal	EPDM
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal Bleeding Valve	FPM
Valve Seal Vacuum Breaker	NBR
Profile Clamp	CrNiMo-steel

Dimensions [mm]		
size	nominal diameter	
	DN 100	
A	165	
B	120	
C	310	
D	220	

Weights [kg]
nominal diameter
DN 100
7.75

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.74

Combined Valve Especially for Water

Technical Data

Connection DN	50 - 150
Nominal Pressure PN	16
Operating Pressure	0 - 8 bar
Flow Rate	1783 Nm^3/h
Temperature	130 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

The EB 1.74 bleeding/venting valve is a combined start-up/continuous bleeding/venting valve with float control. During start-up a large volume of air is bled at low pressure via a large valve cone. When the bleed valve is closed and small air volumes have to be bled during continuous operation, an additional smaller cone in the valve opens and bleeds these smaller volumes. The large cone will not open until the liquid level and the pressure drops. The valve opens immediately if a vacuum forms.

The EB 1.74 bleeding/venting valve is a compact and lightweight float-controlled valve. It is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone can be fitted with a soft or metallic seal. The minimum pressure required for valve sealing is 0.2 bar.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special toolin

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» ozone-resistant design
» various seal materials suitable for your medium
» plastic coating for corrosive fluids
» non-return valve to prevent venting
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Air Flow Rate Nm^3/h at 0 °C, 1013 mbar

	ΔP bar	nominal diameter DN				
		50	65	80	100	150
start-up bleeding	0.05	113		396		728
	0.1	159		560		1030
	0.2	225		790		1455
	0.3	276		970		1783
continuous bleeding	1	11		25		55
	2	16		38		85
	4	28		63		140
	6	39		88		209
	8	50		114		250
venting	0.1	150		530		975
	0.2	200		710		1300
	0.3	230		810		1490
	0.4	245		870		1595

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.74

Combined Valve Especially for Water

Materials	
Body	CrNiMo-steel
Body Seal	EPDM
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve seal	EPDM + metallic
Profile Clamp	CrNiMo-steel

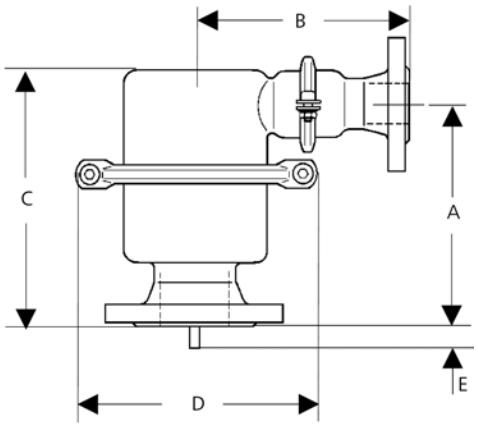
Dimensions [mm]					
size	nominal diameter DN				
	50/50	65/65	80/65	100/65	150/80
A	285	285	300	265	695
B	175	235	235	235	300
C	325	330	340	310	795
D	200	265	265	265	273
E	25	40	25	55	-

Weights [kg]				
nominal diameter DN				
50	65	80	100	150
9	15.5	16	16.5	45

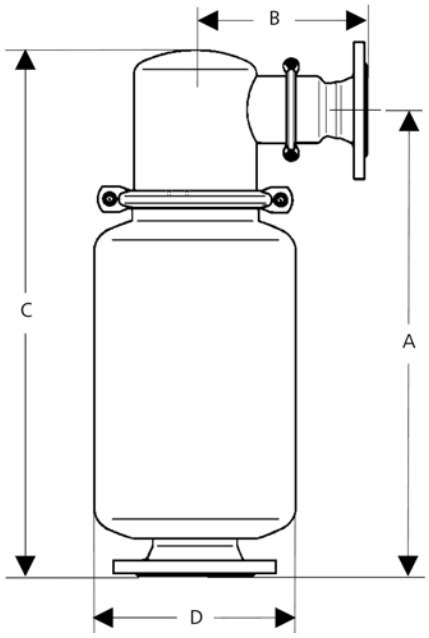
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

DN 50 - 100



DN 150



Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.75

Epoxy-coated Cast Valve for water

Technical Data

Connection DN	50 - 200
Connection G	1 + 2
Nominal Pressure PN	16 - 40
Operating Pressure	0.3 - 40 bar
Flow Rate	venting up to 7600 Nm^3/h bleeding up to 6100 Nm^3/h Working venting up to 33 Nm^3/h
Temperature	60 °C
Medium	water

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves.

EB 1.75 is a combined start-up and continuous bleeding and venting valve with float control. During start-up a large quantity of air is removed at low pressure via a large cone. If the ventilator is closed and further small quantities of air occur in continuous operation, a second small cone opens and removes all the air present. The large cone does not open until the level drops and pressure decreases at the same time. In the case of underpressure the valves open immediately.

EB 1.75 bleeding and venting valves are float-controlled, compact devices for water. The housings are made of spheroidal graphite iron with a continuous epoxy coating. The valve cone is soft-sealed.

The upper and lower sections of the valve unit are each connected by means of only 4 screws. This means that maintenance work can be performed rapidly and without the need for special tools.

Standard

» body made of spheroidal graphite iron with an epoxy coating
» float made of PP

Options

» purging connection in stainless steel
» without continuous venting
» anti-shock system
» degassing connection designed as a plastic manifold for specific removal of exhaust air
» special designs on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Flow Rate in Nm^3/h see sheet EB 1.75/2.1.....3

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.75

Epoxy-coated Cast Valve for water

Materials	
Body	spheroidal cast iron epoxy coated
Body Seal	NBR
Internels	stainless steel
Float	PP
Valve Seal	NBR
Drain Valve	stainless steel

Dimensions [mm]									
size	nominal diameter								
	1"	2"	50	65	80	100	150R	150	200
A	113	142	142	142	174	217	217	325	325
B	205	260	275	275	300	350	425	490	490
C	-	-	165	185	205	235	300	300	375
D	CH45	CH75	-	-	-	-	-	-	-

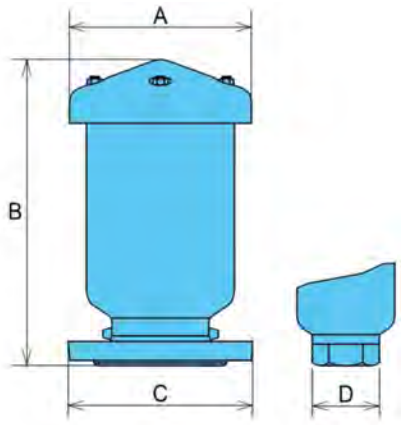
Weights with cap [kg]								
nominal diameter								
1"	2"	50	65	80	100	150R	150	200
3.2	6.2	8.6	9	12.4	19.7	33	56	58

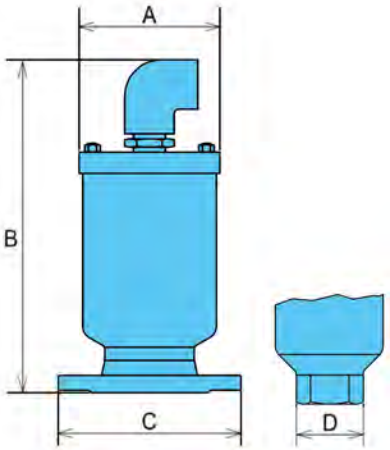
Dimensions with manifold [mm]									
Maß	Nennweite								
	1'	2'	50	65	80	100	150R	150	200
A	95	118	118	118	140	176	218	261	333
B	290	395	395	395	450	550	600	660	720
C	-	-	165	185	205	235	300	300	375
D	CH45	CH75	-	-	-	-	-	-	-

Wheights with manifold [kg]								
Nennweite								
1'	2'	50	65	80	100	150R	150	200
3.3	6.1	8.1	8.6	11.1	18.5	34.5	49	54

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.75

Epoxy-coated Cast Valve for water

Air Flow Rate Nm³/h at 0 °C, 1013 mbar for standard design			
	ΔP bar	nominal diameter G	
		1	2
bleeding	0,05	50	250
	0,1	100	500
	0,3	250	750
start-up venting	0,05	50	250
	0,1	100	500
	0,3	250	1000
continuous venting	2	2,5	2,5
	6	3,5	3,5
	8	6,5	6,5
	10	7	7
	16	8	8

Air Flow Rate Nm³/h bei 0 °C, 1013 mbar for standard design								
	ΔP bar	nominal diameter DN						
		50	65	80	100	150R	150	200
bleeding	0,05	250	250	1000	1500	2100	3000	3000
	0,1	500	500	1500	2000	3000	4200	4200
	0,3	750	750	2000	2900	4400	6100	6100
start-up venting	0,05	250	250	1000	1500	2100	3000	3000
	0,1	500	500	1500	2100	3000	4500	4500
	0,3	1000	1000	2000	3600	5400	7600	7600
continuous venting	2	2,5	2,5	3	3	3	3,5	3,5
	6	3,5	3,5	7	7	7	10	10
	8	6,5	6,5	12	12	12	19	19
	10	7	7	14	14	14	22	22
	16	8	8	21	21	21	33	33
40				15				

Air Flow Rate Nm³/h at 0 °C, 1013 mbar for anti-hammer system			
	ΔP bar	nominal diameter G	
		1	2
bleeding	0,05	60	200
	0,1	100	270
	0,3	150	500
start-up venting	0,05	4,5	7
	0,1	6	11
	0,3	12	20
continuous venting	2	2,5	2,5
	6	3,5	3,5
	8	6,5	6,5
	10	7	7
	16	8	8

Air Flow Rate Nm³/h at 0 °C, 1013 mbar for anti-hammer system								
	ΔP bar	nominal diameter DN						
		50	65	80	100	150R	150	200
bleeding	0,05	200	200	370	670	1050	1600	1600
	0,1	270	270	550	950	1500	2300	2300
	0,3	500	500	950	1600	2600	4000	4000
start-up venting	0,05	7	7	15	20	27	38	38
	0,1	11	11	20	30	39	50	50
	0,3	20	20	40	53	70	94	94
continuous venting	2	2,5	2,5	3	3	3,5	3,5	3,5
	6	3,5	3,5	7	7	10	10	10
	8	6,5	6,5	12	12	19	19	19
	10	7	7	14	14	22	22	22
	16	8	8	21	21	33	33	33

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

The quoted flow volumes apply to a fully open valve i.e. in start-up condition at 0 °C and 1013 mbar.

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.84

Combined Valve for Dirty or Waste Water

Technical Data

Connection DN	50 - 150
Nominal Pressure PN	10 - 16
Operating Pressure	0 - 16 bar
Flow Rate	1.100 Nm^3/h
Temperature	130 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

The EB 1.84 bleeding/venting valve is a combined start-up/continuous bleeding/venting valve with float control for waste water and effluents as well as foaming media. The enlarged float chamber prevents contact between the dirty water and the upper part of the closing mechanism. It is manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone can be fitted with a soft or metallic seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special toolin

During start-up a large volume of air is bled at low pressure via a large valve cone. When the bleed valve is closed and small air volumes have to be bled during continuous operation, an additional smaller cone in the valve opens and bleeds these smaller volumes. The large cone will not open until the liquid level and the pressure drops. The valve opens immediately if a vacuum forms. The minimum pressure required for valve sealing is 0.2 bar.

Standard

» all stainless steel construction
» quick-release body clamp ring
» operating pressure 0 - 10 bar

Options

» operating pressure 0 - 16 bar
» flushing connection
» various seal materials suitable for your medium
» plastic coating for corrosive fluids
» non-return valve to prevent venting
» special connections: Aseptic, ANSI or JIS flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Air Flow Rate [Nm^3/h] at 0°C, 1013 mbar

	ΔP bar	nominal diameter DN				
		50	65	80	100	150
start-up bleeding	0.05	115		400		430
	0.1	160		560		610
	0.2	225		790		860
	0.3	280		970		1100
comtinuous bleeding	1	10		25		25
	2	15		40		40
	4	30		65		65
	6	40		90		90
	8	50		115		115
	10	65		140		140
venting	0.1	150		530		580
	0.2	200		710		780
	0.3	230		810		890
	0.4	245		870		950

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.84

Combined Valve for Dirty or Waste Water

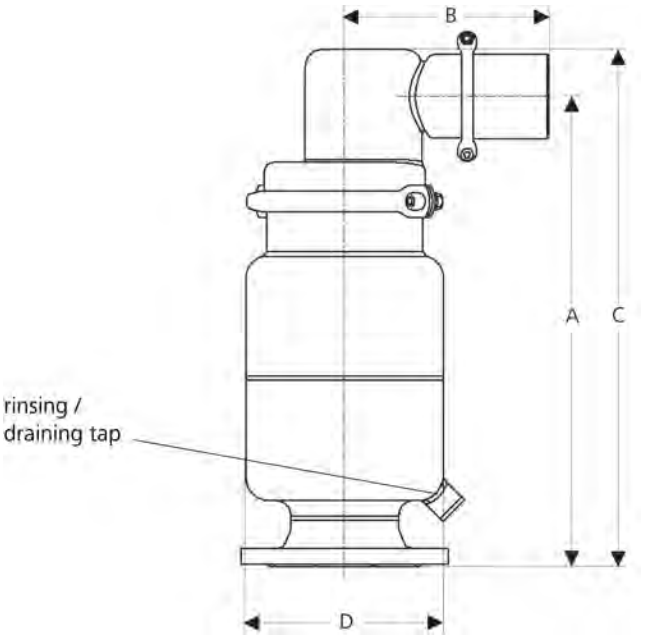
Materials	
Body	CrNiMo-steel
Body Seal	EPDM
Internals	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	EPDM
Prifile Clamp	CrNiMo-steel

Dimensions [mm]					
size	nominal diameter DN				
	50	65	80	100	150
A	470	518	500	500	518
B	175	217	217	217	217
C	515	575	555	555	575
D	265/ø 210	265/ø 210	265/ø 210	265/ø 210	ø 285

Weights [kg]				
nominal diameter DN				
50	65	80	100	150
15	20	21	21	22

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.85

Epoxy-coated Cast Valve for Waste Water

Technical Data

Connection DN	50 - 200
Connection G	2
Nominal Pressure PN	10 - 16
Operating Pressure	0.3 - 16 bar
Flow Rate	venting up to 4200 Nm³/h bleeding up to 4100 Nm³/h working venting up to 32 Nm³/h
Temperature	70 °C
Medium	wastewater and sewage

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves.

EB 1.85 is a combined start-up and continuous bleeding and venting valve with float control. During start-up a large quantity of air is removed at low pressure via a large cone. If the ventilator is closed and further small quantities of air occur in continuous operation, an additional small seat opens and removes the air present. The large cone does not open until the level drops and pressure decreases at the same time. In the case of underpressure the valves open immediately. The minimum pressure for the valve seal is 0.3 bar.

The EB 1.85 is a float-controlled bleeding and venting valve for wastewater and sewage as well as for foaming media. An enlarged float housing prevents contact between the wastewater and the upper section of the closing mechanism. The housings are made of spheroidal graphite iron with a continuous epoxy coating and are therefore outstandingly well protected. The valve cone is soft-sealed.

The upper and lower sections of the valve unit are each connected by means of only 4 screws. Maintenance work can be performed rapidly and without the need for special tools.

Standard

- spheroidal graphite iron with an epoxy coating
- float made of stainless steel
- purging connection in galvanised brass

Options

- purging connection in stainless steel
- shock pressure attentuation by anti-shock-system for closing smoothly and controlled
- degassing connection designed as a plastic manifold for specific removal of exhaust air
- special designs on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Air Flow Rate [m³/h] at 0°C, 1013 mbar, Nominal Pressure PN for standard design

	ΔP	nominal diameter						
	bar	G 2	DN 50	DN 65	DN 80	DN 100	DN 150	DN 200
bleeding	0.05	75	200	200	700	700	1600	1600
	0.1	110	260	260	1000	1000	2300	2300
	0.3	180	480	480	1750	1750	4100	4100
start-up venting	0.05	75	200	200	800	800	1500	1500
	0.1	100	260	260	1150	1150	2250	2250
	0.3	195	500	500	1900	1900	4200	4200
continuous venting	2	3.5	3.5	3.5	4.5	4.5	6.5	6.5
	4	7	6.5	6.5	7	7	13	13
	6	9.5	7.5	7.5	10	10	18	18
	8	14	12	12	16	16	28	28
	10	16	13	13	18	18	32	32
	16	25	20	20	30	30		
nom. press.	PN	16	16	16	16	16	10	10

Air Flow Rate [m³/h] at 0°C, 1013 mbar, Nominal Pressure PN with anti-hammer system

	ΔP	nominal diameter						
	bar	G 2	DN 50	DN 65	DN 80	DN 100	DN 150	DN 200
bleeding	0.05	75	200	200	450	450	1200	1200
	0.1	100	300	300	650	650	1650	1650
	0.3	180	480	480	1150	1150	2800	2800
start-up venting	0.05	4.5	8	8	18	18	40	40
	0.1	6.5	11	11	25	25	60	60
	0.3	11	20	20	45	45	110	110
continuous venting	2	3.5	without continuous venting					
	4	7						
	6	10						
	8	14						
	10	18						
	16	27						
nom. press.	PN	16	10	10	10	10	10	10

Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 1.85

Epoxy-coated Cast Valve for Waste Water

Materials	
Body	spheroidal cast iron epoxy coated
Body Seal	NBR
Internals	stainless steel / PP
Float	stainless steel
Valve Seal	NBR
Purging Valve	brass zinced, stainless steel (option)

Dimensions [mm] for sleeve connection		
size	EB 1.85	EB 1.85AS*
	inlet female G 2 outlet male G 1	inlet female G 2 outlet male G 1
A	1'	1'
B	380	389
C	2'	2'
D	137	137

Weights [kg] for sleeve connection	
EB 1.85	EB 1.85AS*
10.5	10.8

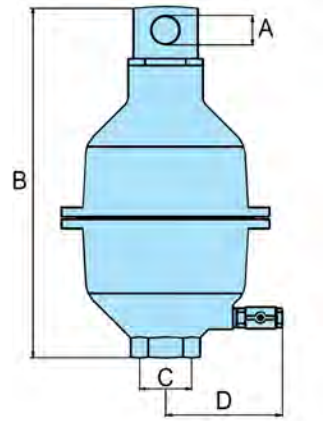
* with anti-hammer system

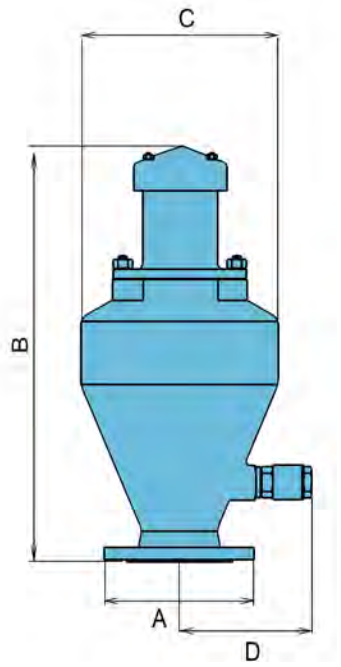
Dimensions [mm] for flange connection						
size	nominal diameter DN					
	50	65	80	100	150	200
A	185	185	220	220	285	340
B	550	550	600	600	850	850
C	300	300	300	350	488	488
D	202	202	208	190	243	243

Weights [kg] for flange connection					
nominal diameter DN					
50	65	80	100	150	200
29	29	31	40	78	82

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing





Bleeding and Venting Valves

Combined Bleeding and Venting Valves EB 6.54

Valve for highest Flow Rates

Technical Data

Connection DN	25 - 300
Nominal Pressure PN	6 - 40
Operating Pressure	0,3 - 40 bar
Flow Rate	18550 Nm³/h
Temperature	130 °C
Medium	liquids

Description

Bleeding and venting valves remove air or gases from systems or pipelines without requiring an external energy input. When a system is drained they act as venting valves; venting may be prevented by fitting a non-return valve.

EB 6.54 is a float-controlled combined start-up and continuous bleeding and venting valve consisting of a main valve for start-up bleed and a continuous bleeding and venting valve built-on laterally. The valve cone is provided with a soft seal, and the minimum pressure for the valve seal is to be 0.3 bar.

Owing to the large seat diametre, large air volumes are discharged at low pressures. The main valve closes as soon as having been filled with liquid. With additional small air quantities accrueing during continuous operation, the continuous bleeding and venting valve opens and discharges the accrueing air. The main valve only opens with falling level and simultaneous pressure relief. If a vacuum arises the valve will open immediately.

Depending on the version the start-up bleeding valves EB 3.50 (PN 6-40) or EB 3.52 (PN 16) can be employed as main valve and for continuous bleeding and venting the types EB 1.12 or EB 1.32 with a nominal width of G 3/4 x 1/2 can be used. Details concerning materials and dimensions can be found on the corresponding data sheets.

Standard

» EB 3.52 up to DN 100 completely made of stainless steel

Options

» various seal materials suitable for your medium
» plastic coating for corrosive fluids
» non-return valve to prevent venting
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Air Flow Rate for Start-up Venting [Nm³/h] with EB 3.52 basis

Δp bar	nominal diameter DN						
	25	32	40	50	65	80	100
0.05	52	90	125	217	378	543	790
0.1	73	126	177	307	534	767	1117
0.2	104	178	250	435	755	1085	1580
0.3	127	219	306	532	925	1330	1935

Air Flow Rate for Start-up Venting [Nm³/h] with EB 3.50 basis

Δp bar	nominal diameter DN					
	100	125	150	200	250	300
0.05	971	1604	2236	3948	5783	7572
0.1	1374	2268	3162	5583	8178	10708
0.2	1940	3210	4470	7900	11570	15150
0.3	2380	3930	5480	9670	14165	18550

Air Flow Rate for Continuous Venting [Nm³/h]

Δp bar	Pressure Range bar *		
	0 - 2	0 - 6	0 - 16
0.5	6.8	2.2	0.6
1	8.6	2.8	0.7
2	12	4.2	1
4		7	1.7
6		9.8	2.4
8			3.1
10			3.8
12			4.5
16			5.9
> 16	on request		

Air Flow Rate for Bleeding [Nm³/h] with EB 3.52 Basis

Δp bar	nominal diamer DN						
	25	32	40	50	65	80	100
0.1	69	120	167	291	507	728	1060
0.2	93	160	223	390	675	970	1410
0.3	106	183	255	445	775	1110	1620
0.4	114	195	275	475	825	1185	1730

Air Flow Rate for Bleeding [Nm³/h] with EB 3.50 basis

Δp bar	nominal diameter DN					
	100	125	150	200	250	300
0.1	1300	2150	3000	5300	7760	10160
0.2	1740	2870	4000	7060	10345	13545
0.3	1990	3290	4580	8090	11850	15520
0.4	2130	3515	4900	8650	12670	16590

Steam Traps

Float-controlled Steam Traps

Universal Valve for Small Flow Rates			KA 2
float-controlled, soft seal valve closure, fully developed lever mechanism, with manual bleeding for steam | usable for steam, compressed air, aerosols | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | very lightweight and compact, corrosion-resistant to aggressive media, especially gastight | easy installation, long operational lifespan			
G	3/4 x 1/2A	PN	16
p	0 - 12 bar	Q	350 l/h
T	190 °C		

Condensate Trap for Compressed Air and Gases			KA 2K
particularly gastight also without fluid content owing to the soft seal valve closure and the fully developed lever mechanism | certified in accordance with ATEX | operating pressures down to millibar range | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to clamp system | very lightweight and compact, corrosion-resistant to aggressive media, especially gastight | manageable installation, long operational lifespan			
G	1/2 x 1/2A 3/4 x 1/2A 1 x 3/4A	PN	16
p	0 - 12	Q	1570 l/h
T	80 °C		

Universal Valve for Larger Flow Rates			KA 2X
metallic seal, for steam with manual bleeding | usable for steam, compressed air, aerosols | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | very lightweight, corrosion-resistant to aggressive media | easy installation, long oper-ational lifespan			
DN	25 x 3/4A	G	1 x 3/4A
PN	16	p	0 - 13
Q	1200 l/h	T	190 °C

Universal Valve with Thermal Bleeding			KA 3
For steam with thermal bleeding, can be polished exernally for clean and ultraclean rooms | suitable for compressed air, aerosols without thermal bleeding | completely made of deep-drawn CrNiMo steel – surface finish of the body Ra ≤ 1.6 µm | very lightweight and compact, corrosion resistant, optimal surface characteristics | easy installation, easy and cost-effective maintenance owing to the clamp system, long operational lifespan			
DN	15 - 25	G	1/2 - 1
PN	16	p	0 - 12 bar
Q	2000 l/h	T	190 °C

High-performance and Sturdy Steam Trap			KA Niagara
With manual or thermal bleeding or fixed continuous bleeding | suitable for steam | body made of GGG-40, GS-C 25, inner parts of CrNiMo steel | solid, well-proven, sturdy, for very high temperatures | extended service intervals, extremely long operational lifespan, reliable, well-known as a high-performance valve			
DN	15 - 150	PN	16 - 40
p	0 - 40 bar	Q	193 m^3/h
T	200 °C		

Selection Steam Traps

T °C	max. p_1 bar	max.Q m^3/h	connection G	connection DN	*	SS	venting device	notes	type
100	12	1,57	1/2 - 1		*	•	option	for cold condensates, with ATEX certificate	2K
190	12	0.35	3/4		*	•	manual vent valve	small stainless steel trap	2
190	13	1.2	1		*	•	manual vent valve	economic stainless steel trap	2X
190	12	2	1/2 - 1	15 - 25	*	•	thermal vent valve	also for sterile applications	3
190	16	193		15 - 150			thermal vent valve	large flow rates	Niagara type 83
300	16	193		15 - 150			thermal start-up and continuous vent valve	large flow rates	Niagara type 80
400	40	193		15 - 150			continuous vent valve	large flow rates	Niagara type 81
400	40	193		15 - 150			manual vent valve	large flow rates	Niagara type 1

* other connections available, • stainless steel deep drawn

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Steam Traps

Float-controlled Steam Traps KA 2

Universal Valve for Small Flow Rates

Technical Data

Connection G	3/4 x 1/2A
Nominal Pressure PN	16
Operating Pressure	0 - 12 bar
Flow Rate	350 l/h
Temperature	190 °C
Medium	steam

Description

Steam traps automatically drain condensate without loss of steam of gas. They operate instantaneously and are not affected by backpressure or pressure fluctuations. They do not require an external energy input.

KA 2 is a float-controlled steam trap for all applications and especially suitable for corrosive condensate and applications in the food industry. It is entirely manufactured from stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Standard

» all stainless steel construction
» quick-release body clamp ring
» manual bleed valve

Options

» various seal materials suitable for your medium
» expansion pipe connection in the valve top section for draining condensate from compressed air or gases
» no manual bleed valve
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]		
0 - 2	0 - 6	0 - 12

Flow Rate [l/h]			
Δp bar	pressure range bar		
	0 - 2	0 - 6	0 - 12
0.1	70	19	6
0.2	100	28	9
0.5	160	40	12
1	230	70	18
2	350	110	27
4	-	160	46
6	-	200	50
8	-	-	60
10	-	-	70
12	-	-	75

Steam Traps

Float-controlled Steam Traps KA 2

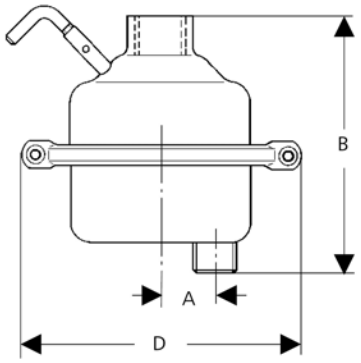
Universal Valve for Small Flow Rates

Materials	
Body	CrNiMo-steel
Body Seal	FEPM
Seat, Cone	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	FFKM

Dimensions [mm] and Weights [kg]		
size	inlet female G 3/4 outlet male G 1/2A	weight kg
A	27	0.85
B	135	
D	140	

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Steam Traps

Float-controlled Steam Traps KA 2K

Condensate Trap for Compressed Air and Gases

Technical Data

Connection G	1/2 x 1/2A 3/4 x 1/2A 1 x 3/4A
Nominal Pressure PN	16
Operating Pressure	0 - 12
Flow Rate	1570 l/h
Temperature	80 °C
Medium	compressed air, gases

Description

The cold condensate trap KA 2K has especially been designed for draining compressed air and gases (e.g. biogas).

Steam traps automatically drain condensate without loss of steam of gas. They operate instantaneously and are not affected by backpressure or pressure fluctuations. They do not require an external energy input.

KA 2K are float-controlled condensate traps for universal use and especially suitable for particularly aggressive condensate. They are completely made of stainless steel featuring maximum corrosion resistance. The valve is equipped with a soft seal and, therefore, absolutely gastight.

Three working pressure ranges can be selected, please refer to the table on the right. The optimised valve mechanism consisting of float, lever and valve seat ensures a reliable and gastight operation also in the millibar working pressure range.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Standard

» all stainless steel construction
» quick-release body clamp ring
» Connection sleeve for gas commuting line (compensation line)

Options

» various seal materials suitable for your medium
» ATEX protection class ⟨Ex⟩ II 2G c IIA
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]		
0 - 2	0 - 6	0 - 12

Flow Rate [l/h]						
Δp bar	G 1/2 - G 3/4 x 1/2A pressure range bar			G 1 x 3/4A pressure range bar		
	0 - 2	0 - 6	0 - 12	0 - 2	0 - 6	0 - 12
0,02	30	11	2	150	34	11
0,05	50	17	4	240	54	17
0,1	70	19	6	350	75	25
0,2	100	28	9	490	105	35
0,5	160	40	12	780	170	55
1	230	70	18	1100	240	75
2	350	110	27	1570	340	110
4	-	160	46	-	480	155
6	-	200	50	-	590	190
8	-	-	60	-	-	220
10	-	-	70	-	-	250
12	-	-	75	-	-	270

Steam Traps

Float-controlled Steam Traps KA 2K

Condensate Trap for Compressed Air and Gases

Materials	
Body	CrNiMo-steel
Body Seal	FPM
Seat, Cone	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	FPM

Dimensions [mm]

size	nominal diameter		
	G 1/2 x 1/2A	G 3/4 x 1/2A	G 1 x 3/4A
A	87	27	140
B	100	135	145
C	45	-	40
D	140	140	200
E	G 1/4	G 1/4	G 1/4

Weights[kg]

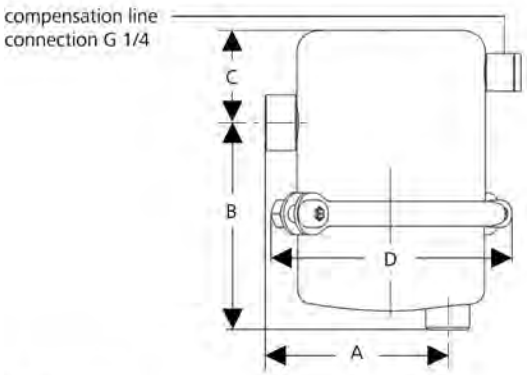
nominal diameter		
G 1/2 x 1/2A	G 3/4 x 1/2A	G 1 x 3/4A
1.1	0.85	2.6

Installation Example:
The condensate is to pass unobstructed towards the condensate trap with a slope.
In case a surge chamber is formed (especially in horizontal lines with shut-off valves), a compensation line must be provided. The line will be connected to the corresponding sleeve at the upper casing and to the receiver or the pipeline located behind it.

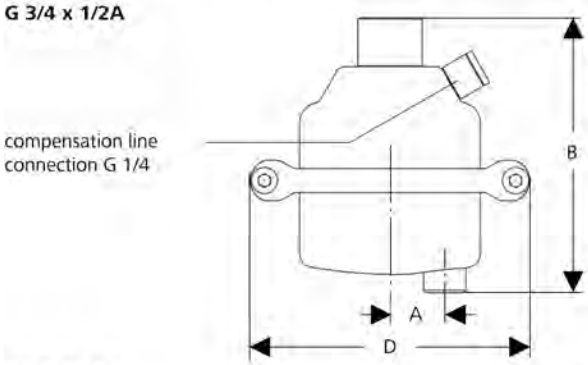
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

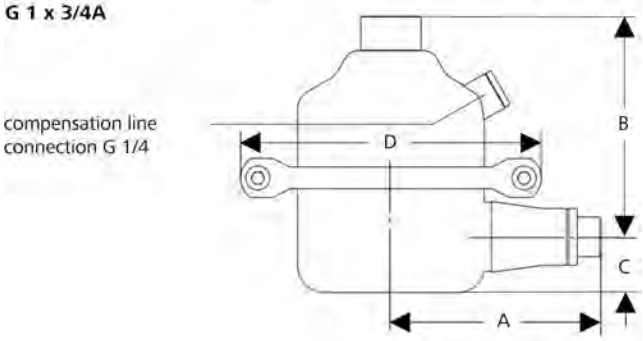
G 1/2 x 1/2A



G 3/4 x 1/2A

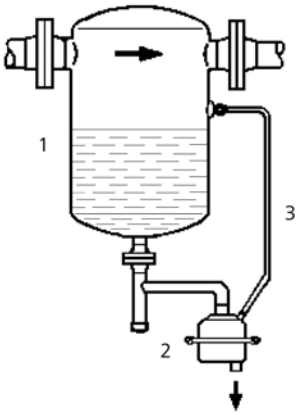


G 1 x 3/4A



Recommended Installation

right



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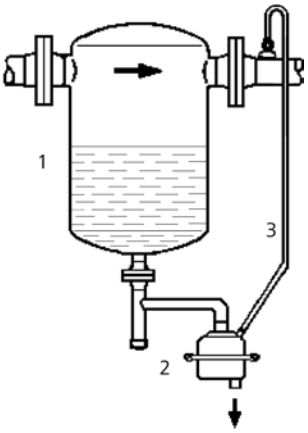
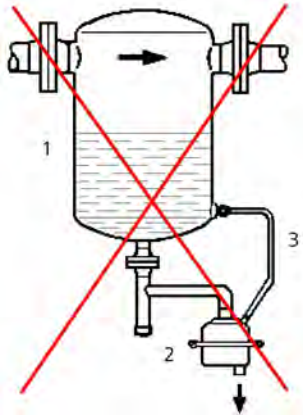


wrong



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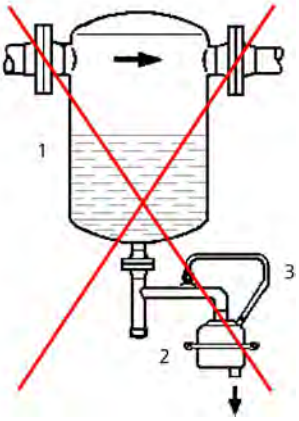


1 condensate collection tank 2 condensate trap 3 compensation line use MANKENBERG-products

Steam Traps

Float-controlled Steam Traps KA 2X

Universal Valve for Larger Flow Rates

Technical Data

Connection DN	25 x 3/4A
Connection G	1 x 3/4A
Nominal Pressure PN	16
Operating Pressure	0 - 13
Flow Rate	1200 l/h
Temperature	190 °C
Medium	steam

Description

Steam traps automatically drain condensate without loss of steam of gas. They operate instantaneously and are not affected by backpressure or pressure fluctuations. They do not require an external energy input.

KA 2X is a float-controlled steam trap for all applications and especially suitable for corrosive condensate and applications in the food industry. It is entirely manufactured from stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a metallic seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Standard

» all stainless steel construction
» quick-release body clamp ring
» manual bleed valve

Options

» various seal materials suitable for your medium
» expansion pipe connection in the valve top section for draining condensate from compressed air or gases
» no manual bleed valve
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Range [bar]
0 - 13

Flow Rate [l/h]										
differential pressure Δp [bar]										
0.1	0.2	0.5	1	2	4	6	8	10	12	13
220	320	710	980	1200	1200	1200	1200	1180	1030	950

Steam Traps

Float-controlled Steam Traps KA 2X

Universal Valve for Larger Flow Rates

Materials	
Body	CrNiMo-steel
Body Seal	FEPM
Seat, Cone	CrNiMo-steel
Float	CrNiMo-steel
Valve Seal	metallic

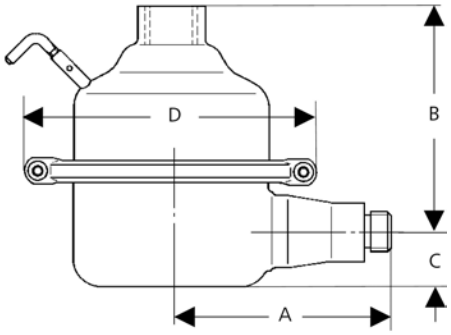
Dimensions [mm]		
size	inlet female G 1 outlet male G 3/4A	inlet flange DN 25 outlet male G 3/4A
A	140	140
B	145	160
C	40	40
D	200	200

Weights[kg]	
inlet female G 1	inlet flange DN 25
2.6	3.5

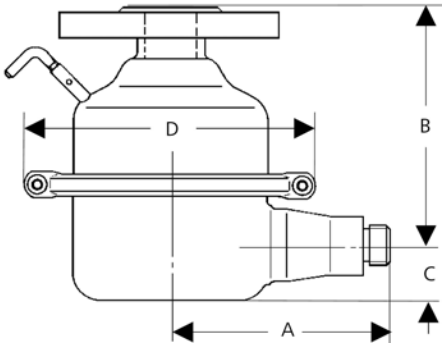
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

KA 2X, G 1



KA 2X, DN 25



Steam Traps

Float-controlled Steam Traps KA 3

Universal Valve with Thermal Bleeding

Technical Data

Connection DN	15 - 25
Connection G	1/2 - 1
Nominal Pressure PN	16
Operating Pressure	0 - 12 bar
Flow Rate	2000 l/h
Temperature	190 °C
Medium	steam

Description

Steam traps automatically drain condensate without loss of steam of gas. They operate instantaneously and are not affected by backpressure or pressure fluctuations. They do not require an external energy input.

KA 3 is a float-controlled steam trap for all applications and especially suitable for corrosive condensate and applications in the food industry. It is entirely manufactured from stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a metallic seal. The KA 3 steam trap is fitted with thermal internal bleeding as standard. For draining condensate from compressed air or gases a special version without thermal bleeding can be supplied featuring G ½ connection on the top section of the valve for connecting an expansion pipe.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

For clean room applications or for condensate subject to stringent purity requirements, KA 3 can be supplied with electropolished or bead-blasted surface finish.

The simple design makes it easy to specify, install, handle and service these valves in an industrial environment.

Standard

» all stainless steel construction
» quick-release body clamp ring
» thermal internal bleeding

Options

» various seal materials suitable for your medium
» expansion pipe connection in the valve top section for draining condensate from compressed air or gases
» bead-blasted or electropolished surface finish for clean or sterile rooms
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]			
bar	0 - 2	0 - 4	0 - 12

Flow Rate [l/h]			
Δp bar	pressure range		
	0 - 2	0 - 4	0 - 12
0.1	300	205	100
0.2	510	290	140
0.5	900	462	220
1	1300	655	315
2	2000	925	445
3		1130	545
4		1300	630
6			805
8			940
10			1080
12			1180

Steam Traps

Float-controlled Steam Traps KA 3

Universal Valve with Thermal Bleeding

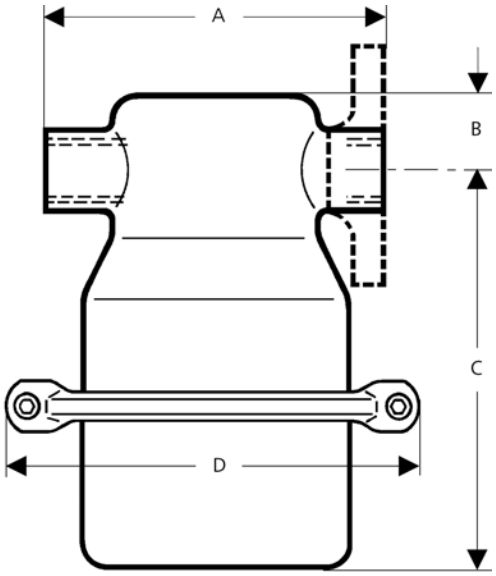
Materials	
Body	CrNiMo-steel
Body Seal	FEPM
Seat, Cone	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm]						
size	nominal diameter					
	G 1/2	G 3/4	G 1	DN 15	DN 20	DN 25
A	160	160	160	160	160	160
B	35	35	35	35	35	35
C	190	190	190	190	190	190
D	200	200	200	200	200	200

Weights [kg]					
nominal diameter					
G 1/2	G 3/4	G 1	DN 15	DN 20	DN 25
2.6	2.6	2.6	4	4.6	5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Steam Traps

Float-controlled Steam Traps KA Niagara

High-performance and Sturdy Steam Trap

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Operating Pressure	0 - 40 bar
Flow Rate	193 m^3/h
Temperature	200 °C
Medium	steam

Description

Steam traps automatically drain condensate without loss of steam of gas. They operate instantaneously and are not affected by backpressure or pressure fluctuations. They do not require an external energy input.

KN Niagara is a float-controlled steam trap for all applications where large volumes have to be handled. Body, cover and valve cap are manufactured from cast iron; the cone is fitted with a metallic seal. NIAGARA KN 1 is fitted as standard equipment with a manual bleed valve and, for the larger valve sizes, with a drain plug in the sludge collecting chamber.

The pipe diameter downstream of the steam trap should be dimensioned according to the volume of condensate and the length of the pipe.

Standard

- KN 1: manual bleed valve
- KN 80: thermal start-up bleeding and fixed continuous bleed orifice
- KN 81: fixed continuous bleed orifice
- KN 83: thermal start-up and continuous bleeding
- KN 88: adjustable continuous bleeding
- from size DN 65 up: drain plug in sludge collecting chamber

Options

- manual test gag
- up to size DN 65: drain plug in sludge collecting chamber (standard equipment for sizes DN 65 and larger)
- various seal materials suitable for your medium
- special versions up to 400 °C
- designs for special applications and extreme operating conditions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar]									
PN 16	0-2	0-4	0-8	0-13	0-16				
PN 25	0-2	0-4	0-8	0-13	0-16	0-22			
PN 40	0-2	0-4	0-8	0-13	0-16	0-22	0-25	0-32	0-40

Steam Traps

Float-controlled Steam Traps KA Niagara

High-performance and Sturdy Steam Trap

Materials		
Body	PN 16	spheroidal cast iron
	PN 25/40	cast steel
Forklever		CrNiMo-steel
Seat		Cr-steel
Cone		CrNiMo-steel
Float		CrNiMo-steel
Body Seal		graphite

Dimensions [mm]

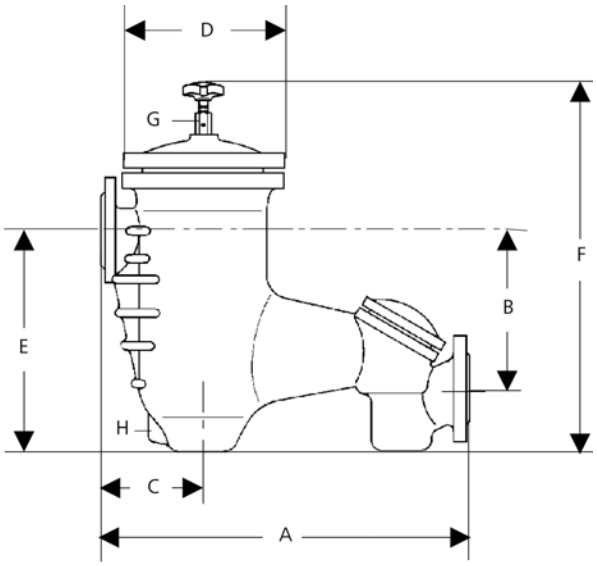
size	PN	nominal diameter DN									
		15	20	25	32	40	50	65	80	100	150
A	16	285	295	340	355	445	530	635	685	800	1055
	25		305	350	415		550	635	685	800	
	40		305	390	415		550	635	720		
B	16	100	135	120	135	170	215	280	270	315	490
	25		155	145	185		235	280	270	315	
	40		155	165	185		235	280	330		
C	16	100	110	140	140	155	175	175	235	300	345
	25		115	140	150		200	215	230	300	
	40		115	160	150		200	215	250		
D	16	130	135	200	210	230	270	285	365	380	520
	25		160	215	230		285	325	345	395	
	40		160	230	230		285	325	390		
E	16	150	185	185	205	245	300	385	370	430	635
	25		215	205	255		320	385	385	450	
	40		215	225	255		320	385	430		
F	16	270	310	310	365	390	470	610	575	655	920
	25		330	345	385		480	550	560	655	
	40		330	365	385		480	550	645		
G	16	1/4	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	1/2
	25		3/8	3/8	3/8		3/8	3/8	3/8	3/8	
	40		3/8	3/8	3/8		3/8	3/8	3/8		
H*	16	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	3/4	3/4
	25	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	
	40	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2		

Weights [kg]

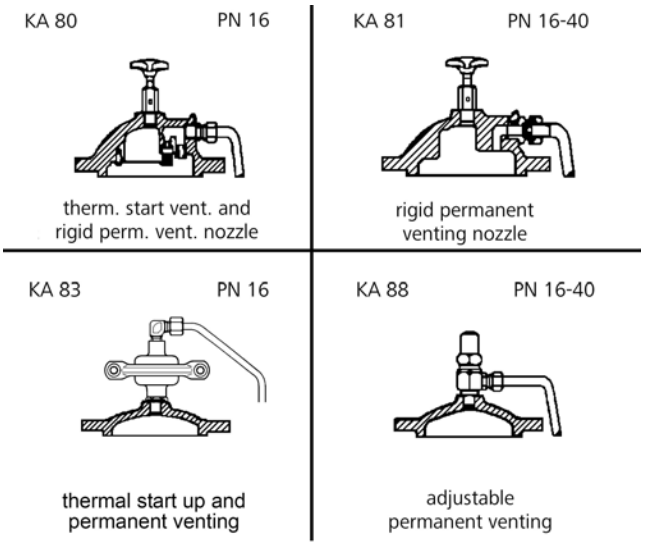
PN	nominal diameter DN									
	15	20	25	32	40	50	65	80	100	150
16	11	12	18	25	31	46	77	107	135	270
25		23	23	30		58	90	110	144	
40		23	23	30		58	90	119		

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Venting Devices



Steam Traps

Float-controlled Steam Traps KA Niagara

High-performance and Sturdy Steam Trap

max. Flow Rate in m^3/h											
pressure range bar	operating pressure bar	nominal diameter DN									
		15	20	25	32	40	50	65	80	100	150
0-2	0.1	0.46	0.57	0.69	1.1	1.94	3.15	5.38	9.5	14.8	35.8
	0.25	0.73	0.9	1.1	1.8	3.1	5	8.6	15.2	23.6	57
	0.5	1.13	1.4	1.7	2.8	4.8	7.8	13.5	23.6	35.8	89
	1	1.59	2	2.4	3.9	6.8	11	19	33.5	52	125
	1.5	2.2	2.7	3.1	5.3	9.5	15.6	26	46	64	172
	2	2.47	3.05	3.7	6	10.6	17.4	29	52	73	193
0-4	0.1	0.28	0.36	0.47	0.7	1.12	2.4	4	6.1	9.5	23
	0.5	0.69	0.9	1.15	1.7	2.8	6	10	15	23.6	60
	1	0.97	1.28	1.6	2.4	4	8.36	14	21.4	33.4	83
	2	1.5	1.95	2.5	3.7	6	13	21.7	32.8	51.4	114
	3	1.84	2.4	3.05	4.52	7.35	15.8	26.6	40.3	63	137
	4	2.12	2.76	3.5	5.3	8.6	18.4	30.7	46.5	72.7	156
0-8	2	0.73	1.06	1.5	1.7	3.7	6	10.2	19.5	29	64.5
	4	1.05	1.5	2.12	2.8	5.22	8.5	12.9	26.3	41	89
	6	1.32	1.9	2.75	3.54	6.66	10.8	15.3	33.5	52.4	106
	8	1.54	2.22	3.13	4.1	7.72	12.5	17	38	60.4	123
0-13	4	0.63	1.05	1.26	1.5	2.76	6.22	11.6	18.2	26.2	55.7
	8	0.94	1.54	1.86	2.22	4.08	9.19	17.2	26.88	37.8	82
	10	1.08	1.76	2.15	2.55	4.69	10.55	19.75	30.86	44.4	98
	12	1.18	1.93	2.33	2.78	5.13	11.55	21.6	33.75	48.6	110
	13	1.23	2.01	2.43	2.9	5.35	12.04	22.5	35.2	50.7	115
0-16	8	0.72	1.19	1.54	1.86	3.12	6.38	14.4	21.7	32.5	82
	12	0.9	1.49	1.93	2.33	3.93	8.02	18	27.4	40.9	110
	14	0.98	1.6	2	2.52	4.24	8.66	19.5	29.5	44.1	119
	16	1.04	1.73	2.23	2.7	4.54	9.26	20.8	31.6	47.2	127
0-22	12		1.22	1.49	1.93		6.49	11.55	15.7	21.6	
	16		1.42	1.73	2.23		7.5	13.34	18.15	24.9	
	18		1.52	1.85	2.4		8.05	14.33	19.5	26.8	
	20		1.61	1.96	2.54		8.49	15.1	20.5	28.2	
	22		1.66	2.04	2.6		8.89	15.82	21.5	29.6	
0-25	16		0.66	1.04	1.36		5.21	9.26	13.34	18.15	
	20		0.75	1.18	1.55		5.9	10.49	15.1	20.5	
	22		0.77	1.22	1.62		6.18	10.98	15.82	21.5	
	25		0.83	1.32	1.74		6.62	11.78	16.96	23.1	
0-32	20		0.52	0.75	1.18		3.05	5.1	8.5		
	22		0.55	0.78	1.22		3.15	5.4	8.9		
	25		0.58	0.84	1.32		3.4	5.8	9.5		
	28		0.62	0.9	1.42		3.65	6.2	10.2		
	32		0.66	0.95	1.5		3.9	6.6	10.85		
0-40	35		0.25	0.69	0.99		2.1	3.8	6.8		
	40		0.28	0.74	1.06		2.3	4.1	7.3		

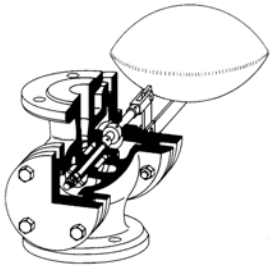
Special designs on request.
The pressure has always been indicated as overpressure.

Float Valves

Float Valves for installation in tanks

Standard Feed Valve of Cast Steel			NV 12, 12P
single-seat feed valve of angle design | body made of GG-25, GGG-40 | incl. lever and float made of CrNiMo-steel, proven technology that requires no external energy | parallel guidance available			
DN	20 - 150	PN	16
p	0 - 8 bar	K_{vs}	2.8 - 195 m^3/h
T	110 °C		

Valve for Flammable Liquids			NV 36SF
overfill protection, with PTB approval, sturdy, well-proven design that is safe to operate, easy installation, requires no external energy, installation independent from the supply network at any point | body made of GS-C 25			
DN	32 - 200	PN	16
p	0 - 16 bar	K_{vs}	11 - 230 m^3/h
T	80 °C		



Compact Stainless Steel Valve			NV 94
single-seat feed or drain valve | suitable for nearly all liquids, also aggressive ones | completely made of CrNiMo-steel (316L) | incl. lever and ball float made of CrNiMo-steel | sturdy technology, smooth surfaces			
G	3/8A - 1 1/2A	PN	16
p	0 - 8 bar	K_{vs}	0.5 - 21 m^3/h
T	300 °C		

Epoxy-coated Valve for Potable Water			NV 95e
angle-type single-seat feed valve, balanced cone | suitable for water, especially for potable water | body made of GGG-50 with epoxy coating in accordance with the KTW Plastics and Drinking Water Guidelines | stainless steel rod, float made of polyethylene			
G	1 - 1 1/4	PN	16
p	0 - 16 bar	K_{vs}	12.6 m^3/h
T	70 °C		

Universal Valve			NV 98
single-seat feed valve of angle design | usable for nearly all liquids, also aggressive ones / completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | incl. lever and ball float made of CrNiMo-steel | parallel guidance available			
DN	40 - 80	G	3/8A - 1 1/2A
PN	16	p	0 - 8 bar
K_{vs}	0.5 - 82 m^3/h	T	130 °C

Know How Float Valves

Level controllers and float valves control the liquid level in a vessel

Level controller or float valve
You should use a level controller with float chamber if the float cannot be mounted in the vessel. It is mounted in the pipeline and connected to the vessel by means of balancing lines.
Float valves have no float chamber. The float is always mounted in the vessel.

Feed and drain valves
Feed valves (code letter "Z") close as the float rises and prevent overflowing. Drain valves (code letter "A") close as the float sinks and ensure that the liquid level does not drop below the required level.

Mounting of float-controlled valves
- Float valves for installations in vessels are mounted inside the vessel complete with float.
- Float valves for installation on vessels are flange- mounted on the outer skin of the vessel.
- Float valves for installation in pipe lines are installed in the feed/drain pipe.
The float lever either projects into the vessel or the float movemen´s is transferred by means of a cable.

Flow direction of float valves
The flow direction determines the mounting arrangement and type of float lever used:
- horizontal, flow direction towards or away from the vessel code letter "w"
- vertical, flow direction upwards code letter "o")
- vertical, flow direction downwards (code letter "u")

Selecting valve type and nominal diameter
To select the valve type and determine the required nominal diameter you should calculate first the operating performance parameter K_v based on the maximum operating values and minimum pressure drop Dp. You should choose a valve having a K_{vs} value which is 30 % greater than the calculated K_v figure.

Selecting the operating pressure range
The maximum operating pressure of your system must be within the operating pressure range of the valve; if not, the float valve will not close or open.

Pressure inside the vessel
Check whether the vessel in which the float is to be mounted is not pressurised. If the vessel is pressurised a pressure-resistant ball float has to be fitted. Cylindrical floats may only be used in non-pressurised vessels.

Temperature
If the valve is to be used for temperatures above 80 °C or a liquid other than water, the compatibility of the elastomers must be checked. For hydrocarbons like gasoline, petrol etc., for example, the valves are fitted with FPM elastomers, whilst for higher temperatures they are fitted with EPDM or, if necessary, with a metallic cone seal.

Adapting the float
Float valves are normally designed for media with the specific gravity of water. By choosing a different float geometry, by filling the float or by altering the operating pressure range, we can adapt the floats to other media.

Balance and double seat
Single seat non-balanced float valves are used for low pressures. They are relatively insensitive to contamination and dirt deposits.
Single seat balanced valves can be used for larger pressure drops and feature smaller floats.
Double seat valves are specially suitable for large flow rates.

Overflow preventers
A special product are the PTB-approved overflow preventers Types 36S and 36SF. These are mechanical safety devices for flammable liquids.

Seat leakage
Level controllers and float valves are control valves which are not required to provide a leak-proof seal (VDI/VDE Guideline 2174). For leakproof shutoff, shut-off valves must be used. Normally our valves leave the factory with perfectly leakproof valve seats. During operation, however, solid particles (e.g. sand, welding nuggets etc.) often cause damage and seat leakage. Any low leakage requirement must be expressly specified when ordering. Valve leakage can be considerably reduced by special measures such as lapping the valve seat, using special cone seals and increasing the valve closing force by changing the lever geometry or increasing the size of the float.

Adjustable filling level
In the case of valves fitted with float rod and adjustable float, the level in the vessel can be adjusted by sliding the float along the rod.

Float rod guide
For float rods a guide must be provided in the vessel to prevent the float oscillating. Float valves with parallel guide or special designs featuring a top-mounted float do not require a rod guide.

Operation
Make sure that no pressure surges or water hammer occur in the system, which could destroy the float. In the case of foaming media and the resulting reduction of the specific gravity, a float valve cannot operate reliably. In this case a foam abatement circuit should be provided.

Maintenance
Float valves and level controllers should be cleaned and serviced at regular intervals. This rule applies especially to valves which are rarely operated e.g. valves fitted in sprinkler systems.
Thorough cleaning is important in the case of liquids containing substances which easily form deposits (such as iron, lime, suspended solids etc). Sand and abrasive particles carried along in the liquid can cause rapid wear. Please ask for specially adapted valves.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

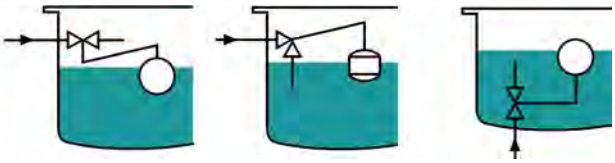
Notes on Safety, operarting instruction etc. MUST be followed.

Know How Float Valves

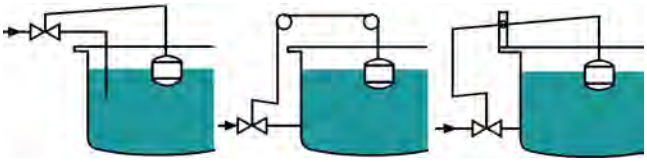
Level controllers and float valves control the liquid level in a vessel

Sample for installation for inflow valves

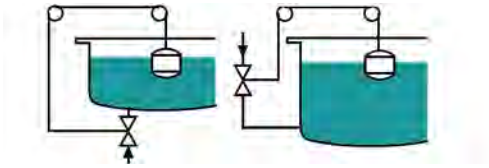
for installation in vessels



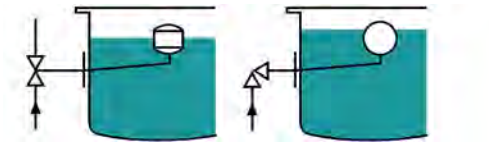
for installation in pipelines, horizontal installation



for installation in pipelines, vertical installation



for installation at tanks



overflow preventer for flammable liquids

Selection Float Valves

for installation in vessels

flow			operating press. bar	K_{VS}-value m^3/h	connection			SS	notes	type
W	S	E			G	DN	*			
		•	8	2.8 - 195		20 - 150			inflow valve made of GG-25	12
•	•		8	0.5 - 21	3/8 - 1 1/2		*	•	inflow or outflow valve, inflow only for closed vessels	94
		•	8	0.5 - 82	3/8 - 1	40 - 80	*	•	inflow or outflow valve, for open or closed vessels	98
		•	16	12.6	1 - 1 1/4				epoxy-coated cast valve for water	95e

overflow protection

flow			operating press. bar	K_{VS}-value m^3/h	connection			SS	notes	type
W	S	E			G	DN	*			
	•		16	11 - 230		32 - 200			with PTB approval for flammable liquids, body cast steel	36SF

* other connections available, • stainless steel deep drawn

W = horizontal flow
S = vertical flow
E = angled flow

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Float Valves

Float Valves for installation in tanks NV 12, 12P

Standard Feed Valve of Cast Steel

Technical Data

Connection DN	20 - 150
Nominal Pressure PN	16
Operating Pressure	0 - 8 bar
K_{vs}-Value	2.8 - 195 m^3/h
Temperature	110 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

The NV 12 and NV 12 P float valves are standard inlet (feed) valves for installation in tanks; they are made of cast iron. The valve cone is fitted with a soft seal.

NV 12P is fitted with a parallel guide which prevents float oscillation if a float bar guide is not fitted in the tank.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

Standard

» ball or cylindrical float (see overleaf)
» NV 12P with parallel guide

Options

» various seal materials suitable for your medium
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]								
nom. diam. DN	20-25	32-40	50	65	80	100	125	150
K_{vs}-value m^3/h	2.8	9.5	12	25	44	70	110	195

Pressure Ranges [bar]		
0 - 2	0 - 4	0 - 8

Float Valves

Float Valves for installation in tanks NV 12, 12P

Standard Feed Valve of Cast Steel

Materials	
Body	up to DN 25 grey cast iron, from DN 32 spherodial cast iron
Cone	CrNiMo-steel
Cone Guide	grey cast iron
Seat	grey cast iron
Valve Seal	EPDM
Float Rod	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm]

size	nominal diameter DN									
	20	25	32	40	50	65	80	100	125	150
A	350	350	455	455	470	610	710	875	1160	1350
B	68	68	88	88	95	104	113	135	165	180
C	100	100	125	125	140	170	180	225	310	350
E	30	30	40	40	50	50	60	60	100	100
F	55	55	80	80	80	80	100	100	100	100
G	5°	5°	5°	5°	10°	10°	10°	20°	20°	20°

Weights without float [kg]

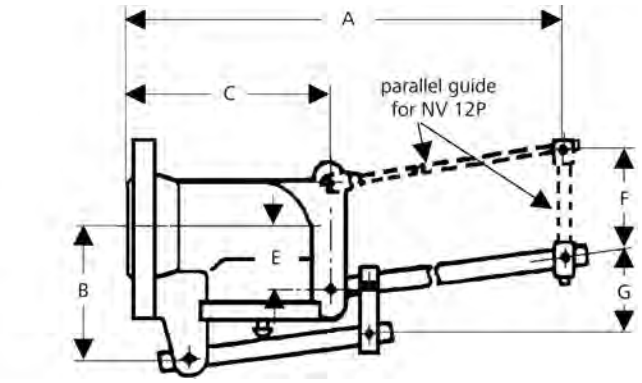
nominal diameter DN									
20	25	32	40	50	65	80	100	125	150
1.8	2	4.5	5	7	9	11	18	27	35

Float Dimensions

pressure range bar	nominal diameter DN									
	20	25	32	40	50	65	80	100	125	150
type	ball float SC 3 ø [mm]*									
0 - 2	160	160								
0 - 4	160	160								
type	cylindrical float SC 8 ø = height in mm									
0 - 2	-	-	200	200	200	200	240	240	280	305
0 - 4	-	-	200	200	200	240	240	280	305	340
0 - 8	200	200	200	200	240	280	280	340	380	420

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for installation in tanks NV 36SF

Valve for Flammable Liquids

Technical Data

Connection DN	32 - 200
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
K_{vs}-Value	11 - 230 m^3/h
Temperature	80 °C
Medium	flammable liquids

Description

This overfill preventer valve has been tested by Physikalisch-Technische Bundesanstalt, the Technischer Überwachungsverein (TÜV) and the Deutscher Ausschuß für brennbare Flüssigkeiten and approved for systems subject to the above regulations. Each overfill preventer valve is given its own factory ID number.

An overfill preventer valve operates under direct float control and requires no external energy. It is installed in the vertical filler pipe in the storage tank. At the end of the filling process the float is lifted by the fluid and closes the filler pipe. The valve closes softly and without pressure surges.

Features:
» robust, proven and reliable design
» easy installation
» requires no energy input
» can be installed at any site, independent of supply networks

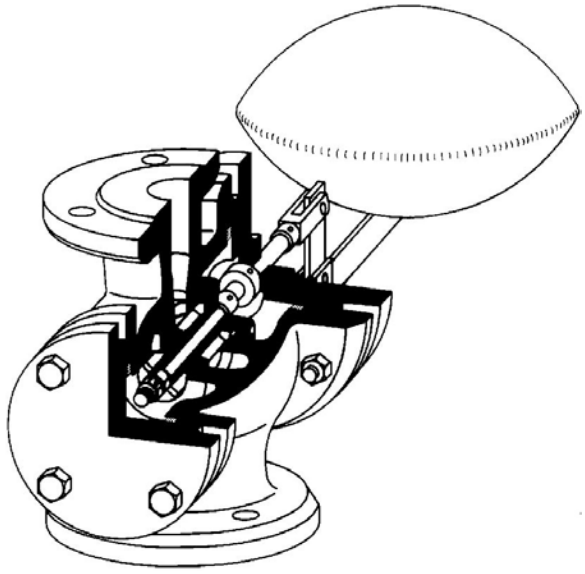
According to the revised version of the German "Verordnung über brennbare Flüssigkeiten" (VbF) (Directive governing flammable liquids) dated 5.6.1970 and the associated German "Technische Regeln über brennbare Flüssigkeiten" (TRbF) (Technical Rules for flammable liquids), systems or system components used in Hazard Areas Zone 0 (TRbF 510), must have design approval in accordance with § 11a of VbF.

Standard

» lenticular float SC 5 or SC 6 (see overleaf)

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



Test Symbol of the Physical Technical Federal Institute

nominal diameter DN	test symbol
32	III B/S 1610 F
40	III B/S 1611 F
50	III B/S 1612 F
65	III B/S 1613 F
80	III B/S 1614 F
100	III B/S 1615 F
125	III B/S 1616 F
150	III B/S 1617 F
200	III B/S 1618 F

K_{vs}-Values m^3/h

nominal diameter DN	pressure range bar	
	0 - 4	0 - 16
32	11	11
40	11	11
50	11	11
65	11	11
80	23	11
100	46	23
125	84	46
150	140	84
200	230	140

Float Valves

Float Valves for installation in tanks NV 36SF

Valve for Flammable Liquids

Materials	
Body	cast steel
Double Seat and Cone	CrNiMo-steel
Spindle	brass
Valve Seal	FPM
Float	CrNiMo-steel

Dimensions [mm]

size	pressure range	nominal diameter DN								
		32	40	50	65	80	100	125	150	200
A	0 - 4 0 - 16	180	200	230	290	310	350	400	480	600
B		180	180	180	235	255	275	300	360	395
C		60	60	60	65	75	90	95	110	140
D		420	420	420	455	525	630	700	784	980
E	0 - 4	185	175	160	125	110	80	85	65	15
	0 - 16	210	200	185	150	130	130	15	30	110

Weights [kg] including float

nominal diameter DN								
32	40	50	65	80	100	125	150	200
18	20	26	40	50	62	87	137	215

Float Type

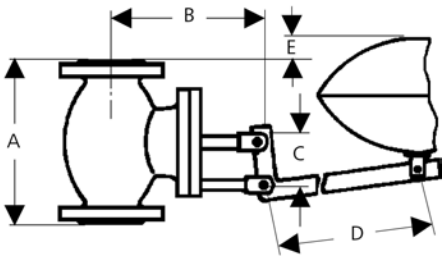
pressure range bar	nominal diameter DN								
	32	40	50	65	80	100	125	150	200
0 - 4	SC 5								
0 - 16	SC 5						SC 6		

Float Dimensions [mm]

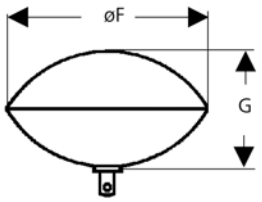
size	pressure range bar	nominal diameter DN								
		32	40	50	65	80	100	125	150	200
øF	0 - 4	350	350	350	350	450	450	500	570	570
	0 - 16	550	550	550	550	550	570	500	570	570
G	0 - 4	280	280	280	280	275	275	300	330	330
	0 - 16	300	300	300	300	300	330	300	330	330

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

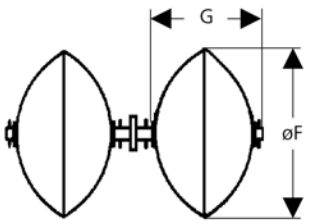
Dimensional Drawing



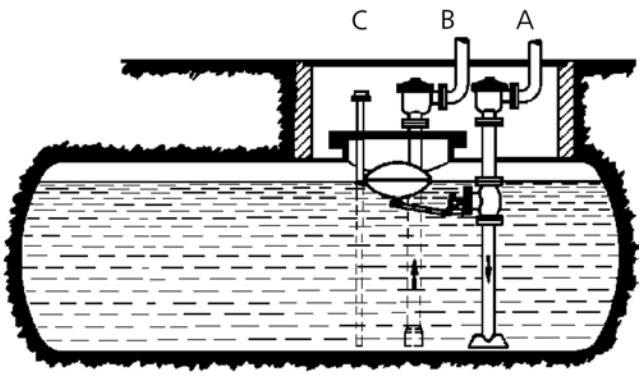
SC 5



SC 6



Recommended Installation



A = filling tube with flame protection and overflow protection
B = outlet pipe with flame protection
C = inspection tube

Float Valves

Float Valves for installation in tanks NV 94

Compact Stainless Steel Valve

Technical Data

Connection G	3/8A - 1 1/2A
Nominal Pressure PN	16
Operating Pressure	0 - 8 bar
K_{vs}-Value	0.5 - 21 m^3/h
Temperature	300 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 94 is a float valve for horizontal or vertical installation inside a tank as inlet or outlet valve. This valve is made entirely of stainless steel featuring excellent corrosion resistance. The valve cone can be fitted with a soft seal (up to 130 °C) or a metallic seal (up to 300 °C).

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
r = includes sealed spindle
example: float valve Z/w (inlet valve for horizontal flow).

Standard

» all stainless steel construction
» SC 3 ball float stainless steel

Options

» various seal materials suitable for your medium
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]

pressure range bar	nominal diameter G					
	3/8	1/2	3/4	1	1 1/4	1 1/2
0 - 2	2	4	6	14	15	21
0 - 4	1.2	3	4	8	8.7	12
0 - 8	0.5	1.6	3	4.5	4.4	6.4

Pressure Ranges [bar]

0 - 2	0 - 4	0 - 8

Float Valves

Float Valves for installation in tanks NV 94

Compact Stainless Steel Valve

Materials	
Body	CrNiMo-steel
Cone	CrNiMo-steel
Seat	CrNiMo-steel
Valve Seal	EPDM up to 130 °C, metallic up to 300 °C
Float	CrNiMo-steel

Dimensions [mm]						
size	nominal diameter G...A					
	3/8	1/2	3/4	1	1 1/4	1 1/2
B	9	13.5	15.5	19.5	24	26
C	56	75	75	97	110	120
D	12	16	16	20	22	25
E	34	42	42	55	63	63
F	110	165	190	225	285	320
G	43	57	57	72	80	90

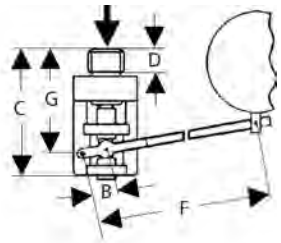
Weights [kg]					
nominal diameter G...A					
3/8	1/2	3/4	1	1 1/4	1 1/2
0.6	0.9	1.3	2	3.5	4.5

Dimensions Ball Float SC 3 [ø mm]					
nominal diameter G ... A					
3/8	1/2	3/4	1	1 1/4	1 1/2
110	130	150	180	200	220

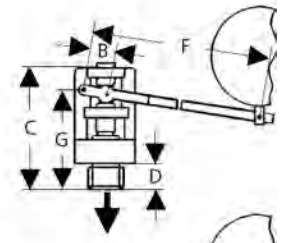
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

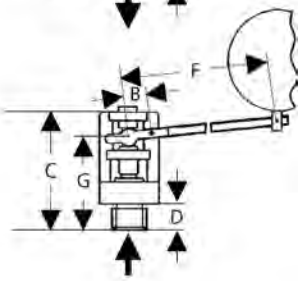
Z/u



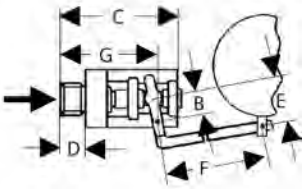
A/u



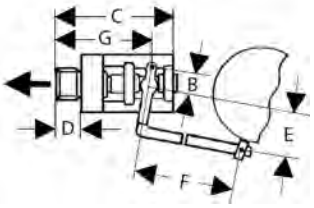
Z/o



Z/w



A/w



Float Valves

Float Valves for installation in tanks NV 95e

Epoxy-coated Valve for Potable Water

Technical Data

Connection G	1 - 1 1/4
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
K_{vs}-Value	12.6 m³/h
Temperature	70 °C
Medium	water, especially potable water

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 95e is a angle-type single-seat feed valve with relieved cone, the cone is fitted with a soft seal. The valves are approved for the use with potable water thanks to the coating of the body in accordance with the KTW guidelines.

The valve's compact design makes it suitable also for small vessels. The patented self-cleaning cone mechanism ensures reliable operation requiring low maintenance.

Standard

» body coated with epoxy in accordance with the KTW guidelines
» patented, self-cleaning cone mechanism
» ball float made of polyethylene

Options

» EPDM seals
» special versdions on request

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

K_{vs} values [m³/h], max. Flow Rate [l/h]
12.6

Float Valves

Float Valves for installation in tanks NV 95e

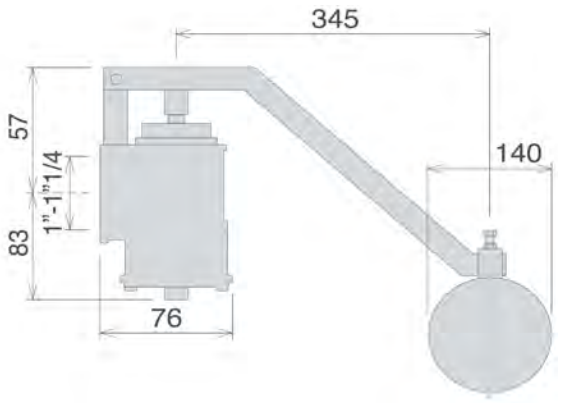
Epoxy-coated Valve for Potable Water

Werkstoffe	
Body	spherodial cast iron Epoxy-coated*
Cap	brass / Edelstahl
Cone and seat	stainless steel
Guide Ring	PTFE
Seals and O-Rings	NBR optional EPDM
Linkage	stainless steel
Floart	polyethylene

Weights [kg]
2,8

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for installation in tanks NV 98

Universal Valve

Technical Data

Connection DN	40 - 80
Connection G	3/8A - 1 1/2A
Nominal Pressure PN	16
Operating Pressure	0 - 8 bar
K_{vs}-Value	0.5 - 82 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 98 is a float valve for horizontal installation inside a tank as inlet valve with outlet at the bottom. This valve is made entirely of stainless steel featuring excellent corrosion resistance. NV 98 R (spigot connection) is fitted with a ball float, NV 98 F (flange connection) is fitted with a cylindrical float that is adjustable on its float bar. NV 98 FP is fitted with a parallel float guide which prevents oscillation of the float. The valve cone is fitted with a soft seal.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

Standard

» all stainless steel construction
» NV 98 R with ball float SC 3
» NV 98 F with cylindrical float SC 8
» NV 98FP with cylindrical float SC 8 and float bar parallel guide

Options

» various seal materials suitable for your medium
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]

pressure range bar	nominal diameter G...A					
	3/8	1/2	3/4	1	1 1/4	1 1/2
0 - 2	1.2	2.5	6	8	13.3	17.8
0 - 4	1.2	2.5	3.5	6	7.9	13.3
0 - 8	0.5	1.2	2.5	4	5	6.4

K_{vs}-Values [m^3/h]

pressure range bar	nominal diameter G...A			
	40	50	65	80
0 - 8	20	32	50	82

Pressure Ranges

nom. diam.	pressure range[bar]		
G 3/8 - 1	0 - 2	0 - 4	0 - 8
DN 40 - 80	0 - 8		

Float Valves

Float Valves for installation in tanks NV 98

Universal Valve

Materials	
Body	CrNiMo-steel
Cone	CrNiMo-steel
Seat	CrNiMo-steel
Valve Seal	G 3/8 FPM, G 1/2 - 1 1/2 EPDM
Float	CrNiMo-steel

Dimensions [mm] NV 98 R						
size	nominal diameter G..A					
	3/8	1/2	3/4	1	1 1/4	1 1/2
A	40	40	40	45	47	47
B	60	60	60	65	72	77
C	85	85	85	90	96	101
D	ø 60	ø 60	ø 60	ø 60	ø 60	ø 60
E	110	110	110	115	123	128
F	16	16	20	20	23	25
G	3/8	3/8	1/2	3/4	1	1 1/4
H	200	200	200	200	200	200
I	125	135	155	175	205	225
K	ø 100	ø 110	ø 130	ø 150	ø 180	ø 200

Weights [kg] NV 98 R					
nominal diameter G ... A					
3/8	1/2	3/4	1	1 1/4	1 1/2
0.9	0.9	1.4	1.5	2.7	3

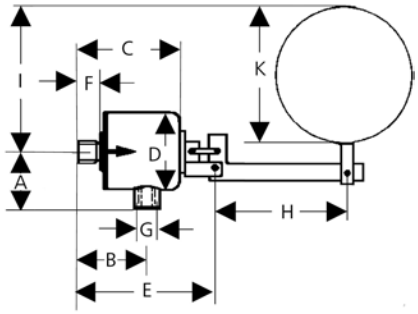
Dimensions [mm] NV 98 F + NV 98 FP				
size	nominal diameter DN			
	40	50	65	80
A	85	95	95	110
B	60	75	75	80
C	105	125	125	140
D	ø 70	ø 90	ø 90	ø 125
E	145	165	165	180
F	ø 43	ø 53	ø 64	ø 80
H	330	330	440	530
I	975	970	965	965
K	ø 280	ø 305	ø 340	ø 380
L	280	305	340	380
M	55	55	80	80

Weights [kg] NV 98 F + NV 98 FP			
nominal diameter DN			
40	50	65	80
6.5	9.5	12.5	13.5

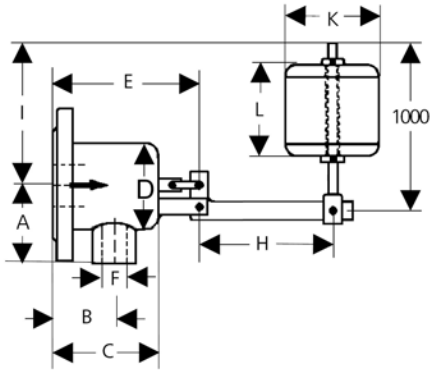
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

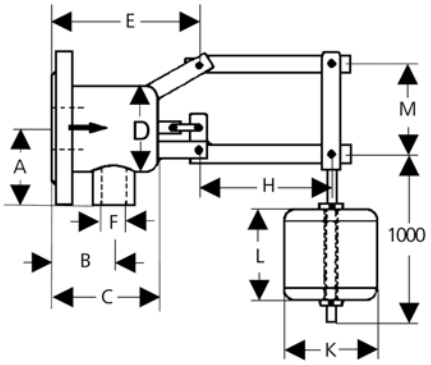
NV 98 RZ/u



NV 98 FZ/u



NV 98 FPZ/u



Float Valves

Float Valves for external installation on tanks

Level Regulating Valve			NV 55
single seat, balanced straight-way valve for feeding or draining | body made of GS-C25 or CrNiMosteel | incl. float rod made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media			
DN	15 - 100	PN	16 - 40
p	0 - 4 bar	K_{vs}	2.6 - 80 m^3/h
T	130 °C		

Level Regulating Valve with Release			NV 55e
single seat, balanced straight-way valve for feeding or draining, for large flow rates | body made of GS-C25 or CrNiMo-steel | incl. float rod and shell-type float made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media			
DN	15 - 150	PN	16 - 40
p	0 - 16 bar	K_{vs}	4 - 160 m^3/h
T	130 °C		

Double Seat Level Regulating Valve			NV 56
double seat, straight-way valve for feeding or draining, for large flow rates and nominal diameters | body made of GGG-40, GS-C25, CrNiMosteel | incl. float rod made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media			
DN	125 - 400	PN	10 - 40
p	0 - 16 bar	K_{vs}	46 - 1800 m^3/h
T	130 °C		

Level Regulating Valve			NV 67e
single-seat, balanced straight-way valve for feeding or draining, large flow rates | usable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | incl. float rod and shell-type float made of CrNiMo-steel			
DN	15 - 100	PN	16
p	0 - 16 bar	K_{vs}	4 - 100 m^3/h
T	130 °C		

Direct Feed or Drain Valve			NV 71
single-seat angle valve for feeding or draining, the tank is filled and drained via the mounting flange on the tank | usable for nearly all liquids | body made of steel, optionally CrNiMo-steel | incl. level and ball float made of CrNiMo steel | rubber coating or synthetic material coating for aggressive media			
DN	25 - 150	PN	10
p	0 - 8 bar	K_{vs}	1.6 - 81 m^3/h
T	300 °C		

Know How Float Valves

Level controllers and float valves control the liquid level in a vessel

Level controller or float valve
You should use a level controller with float chamber if the float cannot be mounted in the vessel. It is mounted in the pipeline and connected to the vessel by means of balancing lines.
Float valves have no float chamber. The float is always mounted in the vessel.

Feed and drain valves
Feed valves (code letter "Z") close as the float rises and prevent overflowing. Drain valves (code letter "A") close as the float sinks and ensure that the liquid level does not drop below the required level.

Mounting of float-controlled valves
- Float valves for installations in vessels are mounted inside the vessel complete with float.
- Float valves for installation on vessels are flange- mounted on the outer skin of the vessel.
- Float valves for installation in pipe lines are installed in the feed/drain pipe.
The float lever either projects into the vessel or the float movemen´s is transferred by means of a cable.

Flow direction of float valves
The flow direction determines the mounting arrangement and type of float lever used:
- horizontal, flow direction towards or away from the vessel code letter "w"
- vertical, flow direction upwards code letter "o")
- vertical, flow direction downwards (code letter "u")

Selecting valve type and nominal diameter
To select the valve type and determine the required nominal diameter you should calculate first the operating performance parameter K_v based on the maximum operating values and minimum pressure drop Dp. You should choose a valve having a K_{vs} value which is 30 % greater than the calculated K_v figure.

Selecting the operating pressure range
The maximum operating pressure of your system must be within the operating pressure range of the valve; if not, the float valve will not close or open.

Pressure inside the vessel
Check whether the vessel in which the float is to be mounted is not pressurised. If the vessel is pressurised a pressure-resistant ball float has to be fitted. Cylindrical floats may only be used in non-pressurised vessels.

Temperature
If the valve is to be used for temperatures above 80 °C or a liquid other than water, the compatibility of the elastomers must be checked. For hydrocarbons like gasoline, petrol etc., for example, the valves are fitted with FPM elastomers, whilst for higher temperatures they are fitted with EPDM or, if necessary, with a metallic cone seal.

Adapting the float
Float valves are normally designed for media with the specific gravity of water. By choosing a different float geometry, by filling the float or by altering the operating pressure range, we can adapt the floats to other media.

Balance and double seat
Single seat non-balanced float valves are used for low pressures. They are relatively insensitive to contamination and dirt deposits.
Single seat balanced valves can be used for larger pressure drops and feature smaller floats.
Double seat valves are specially suitable for large flow rates.

Overflow preventers
A special product are the PTB-approved overflow preventers Types 36S and 36SF. These are mechanical safety devices for flammable liquids.

Seat leakage
Level controllers and float valves are control valves which are not required to provide a leak-proof seal (VDI/VDE Guideline 2174). For leakproof shutoff, shut-off valves must be used. Normally our valves leave the factory with perfectly leakproof valve seats. During operation, however, solid particles (e.g. sand, welding nuggets etc.) often cause damage and seat leakage. Any low leakage requirement must be expressly specified when ordering. Valve leakage can be considerably reduced by special measures such as lapping the valve seat, using special cone seals and increasing the valve closing force by changing the lever geometry or increasing the size of the float.

Adjustable filling level
In the case of valves fitted with float rod and adjustable float, the level in the vessel can be adjusted by sliding the float along the rod.

Float rod guide
For float rods a guide must be provided in the vessel to prevent the float oscillating. Float valves with parallel guide or special designs featuring a top-mounted float do not require a rod guide.

Operation
Make sure that no pressure surges or water hammer occur in the system, which could destroy the float. In the case of foaming media and the resulting reduction of the specific gravity, a float valve cannot operate reliably. In this case a foam abatement circuit should be provided.

Maintenance
Float valves and level controllers should be cleaned and serviced at regular intervals. This rule applies especially to valves which are rarely operated e.g. valves fitted in sprinkler systems.
Thorough cleaning is important in the case of liquids containing substances which easily form deposits (such as iron, lime, suspended solids etc). Sand and abrasive particles carried along in the liquid can cause rapid wear. Please ask for specially adapted valves.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

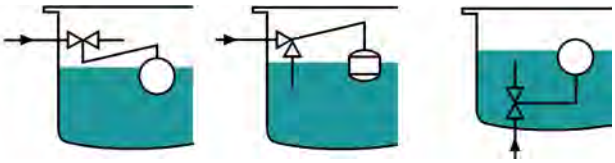
Notes on Safety, operarting instruction etc. MUST be followed

Know How Float Valves

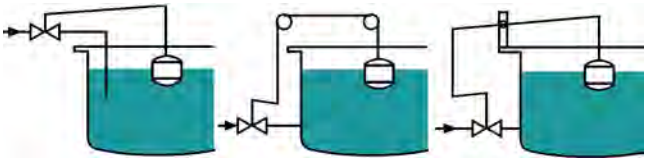
Level controllers and float valves control the liquid level in a vessel

Sample for installation for inflow valves

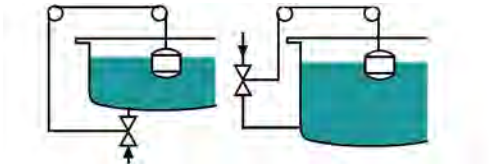
for installation in vessels



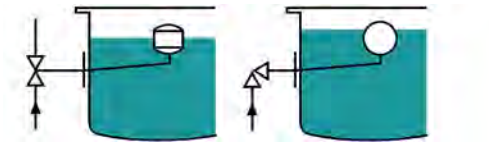
for installation in pipelines, horizontal installation



for installation in pipelines, vertical installation



for installation at tanks



overflow preventer for flammable liquids

Selection Float Valves

for installation on vessels

flow			operating press. bar	K_{vs}-value m^3/h	connection			SS	notes	type
W	S	E			G	DN	*			
	•		4	3 - 80		15 - 100			economical valve up to 4 bar	55
		•	8	2 - 81		25 - 100	*		direct feed or drain through the mounting flange at the vessel	71
	•		16	4 - 100		15 - 100	*	•	economical stainless steel valve, single seat, balanced	67e
•	•		40	4 - 160		15 - 150			standard valve, single seat, balanced	55e
	•		40	46 - 1800		125 - 400			double seat	56

* other connections available, • stainless steel deep drawn

W = horizontal flow
S = vertical flow
E = angled flow

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Float Valves

Float Valves for external installation on tanks NV 55

Level Regulating Valve

Technical Data

Connection DN	15 - 100
Nominal Pressure PN	16 - 40
Operating Pressure	0 - 4 bar
K_{vs}-Value	2.6 - 80 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 55 is a single seated pipeline valve with tank connecting flange for vertical flow. The standard soft seal ensures perfect sealing of the valve.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
example: float valve Z/o (inlet valve for vertical flow upwards)

Standard

» tank connecting flange
» float bar stainless steel

Options

» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» spindle sealed against the tank (for example with Rießler plants)
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar] und K_{vs}-Values [m^3/h]

pressure range bar	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
0 - 1	2.6	3.5	3.5	5.7	7.6	15	27	47	80
0 - 4	2.6	3.5	3.5	5.7	7.6	7.6	15	27	47

Float Valves

Float Valves for external installation on tanks NV 55

Level Regulating Valve

Materials	
Body	cast steel optional CrNiMo-steel*
Cone and Seat	chromium steel optional CrNiMo-steel
Cone Guide	Rg optional CrNiMo-steel
Valve Seal	EPDM
Linkage	steel zinced or steel, optional CrNiMo-steel

* up to DN 100 made of CrNiMo-steel use NV 67e

Dimensions [mm] and Weights [kg] PN 10/16*									
size	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
A	130	150	160	180	200	230	290	310	350
B	180	180	180	200	200	200	300	300	300
C	55	55	55	125	125	125	105	105	105
D	95	95	95	115	115	115	175	175	175
E	210	210	210	280	280	280	420	420	420
F	30	30	30	40	40	40	60	60	60
H	100	100	100	125	125	125	200	200	200
kg	10	11	12	19	21	24	45	53	65

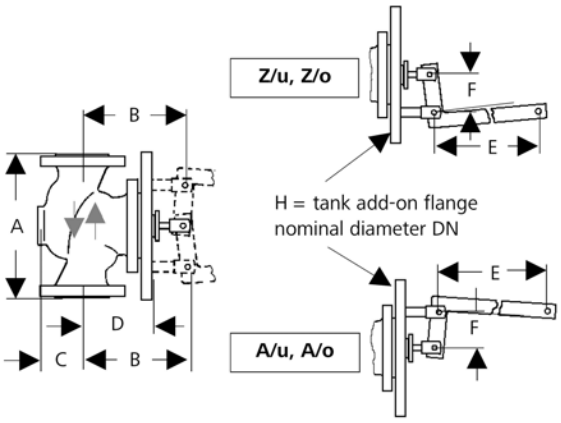
* PN 25/40 on request

Necessary Cylindrical Float ø SC 8 [mm] (ø = height)*									
pressure range	nominal diameter DN								
bar	15	20	25	32	40	50	65	80	100
0 - 1	200	200	200	200	200	240	280	280	305
0 - 4	240	240	240	240	280	280	305	340	420

*dimensions and weights see sheet no. SC 2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for external installation on tanks NV 55e

Level Regulating Valve with Release

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Operating Pressure	0 - 16 bar
K_{vs}-Value	4 - 160 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 55e is a pipeline valve complete with tank connecting flange for vertical flow. The valve cone is fitted with a soft seal.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
example: float valve Z/o (inlet valve for vertical flow upwards)

Standard

» float bar stainless steel
» cylindrical float SR 8 stainless steel

Options

» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]					
nom. diam. DN	15	20	25	40	50
K_{vs}-value m^3/h	4	5	6	20	32

K_{vs}-Values [m^3/h]					
nom. diam. DN	65	80	100	125	150
K_{vs}-value m^3/h	50	80	100	140	160

Float Valves

Float Valves for external installation on tanks NV 55e

Level Regulating Valve with Release

Materials	
Body	cast steel optional CrNiMo-steel
Cone and Seat	grey cast iron, chromium steel
Piston and Spindle	chromium steel optional CrNiMo-steel
Valve Seal	EPDM
Linkage	steel zinced or steel
Float Rod	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm] and Weights [kg] PN 16*										
size	nominal diameter DN									
	15	20	25	40	50	65	80	100	125	150
A	130	150	160	200	230	290	310	350	400	480
B	180	180	180	200	200	300	300	300	340	410
C	55	55	55	125	125	105	105	105	185	200
D	95	95	95	115	115	175	175	175	235	255
E	210	210	210	280	280	420	420	420	420	490
F	30	30	30	40	40	60	60	60	60	70
H	100	100	100	125	125	200	200	200	250	250
Weights without float										
kg	10	11	12	21	24	45	53	65	103	133

* PN 25/40 on request

Cylindrical Float ø SR 8 [mm] (ø = Höhe) *										
nom. diam. DN	15	20	25	40	50	65	80	100	125	150
float ø mm	200	200	200	280	280	305	305	305	340	340

*dimensions and weights see sheet SR 2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
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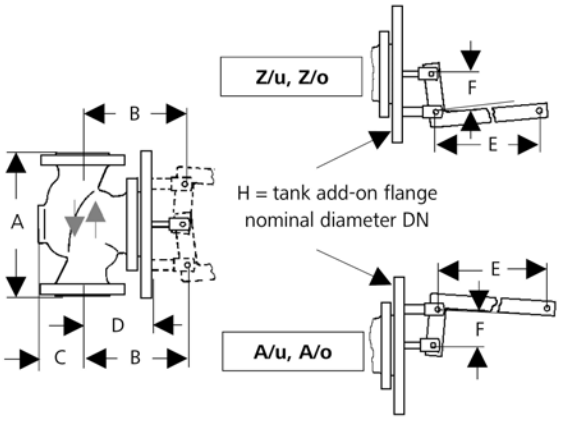
Dimensional Drawing



Float Valves

Float Valves for external installation on tanks NV 56

Double Seat Level Regulating Valve

Technical Data

Connection DN	125 - 400
Nominal Pressure PN	10 - 40
Operating Pressure	0 - 16 bar
K_{vs}-Value	46 - 1800 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 56 is a pipeline valves with tank connecting flange for vertical flow. The standard soft seal ensures perfect sealing of the valve.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
example: float valve Z/o (inlet valve for vertical flow upwards)

Standard

» tank connecting flange
» float bar stainless steel

Options

» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» spindle sealed against the tank (for example with Rießler plants)
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar] und K_{vs}-Values [m^3/h]

pressure range	nominal diameter DN						
bar	125	150	200	250	300	350	400
0 - 1	140	230	380	570	1000	1000	1800
0 - 4	84	140	230	380	570	570	1000
0 - 16	46	84	140	230	380	380	570

Float Valves

Float Valves for external installation on tanks NV 56

Double Seat Level Regulating Valve

Materials		
Body	PN 16	spherodial cast iron or cast steel
	PN 25 - 40	cast steel
	PN 16 - 40	optional CrNiMo-steel
Cone and Seat		CR-steel optional CrNiMo-steel
Cone Guide		Rg optional CrNiMo-steel
Valve Seal		EPDM
Linkage		steel zinced or steel, optional CrNiMo-steel

Dimensions [mm] and Weights [kg] PN 10/16*							
size	nominal diameter DN						
	125	150	200	250	300	350	400
A	400	480	600	730	850	980	1100
B	340	410	460	500	550	550	550
C	185	200	210	250	290	290	385
D	235	255	295	350	380	380	380
E	420	490	630	700	770	770	770
F	60	70	90	100	110	110	110
H	250	250	300	350	400	400	500
kg	98	133	222	302	510	570	725

* PN 25/40 on request

Necessary Cylindrical Float ø SC 8 [mm] (ø = height)*							
pressure range bar	nominal diameter DN						
	125	150	200	250	300	350	400
0 - 1	240	305	305	340	380	380	380
0 - 4	280	340	340	380	420	420	460
0 - 16	380	420	460	500	600	600	600

*dimensions and weights see sheet no. SC/2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
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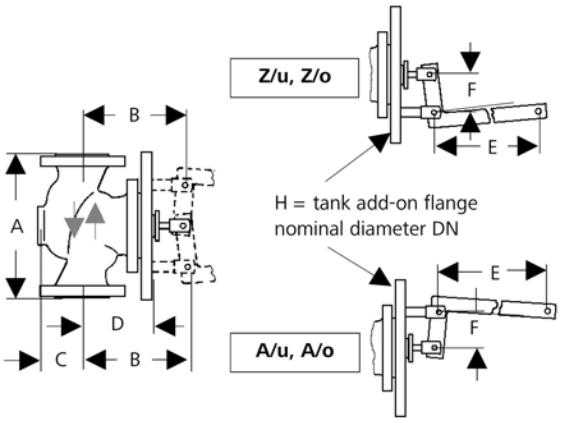
Dimensional Drawing



Float Valves

Float Valves for external installation on tanks NV 67e

Level Regulating Valve

Technical Data

Connection DN	15 - 100
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
K_{vs}-Value	4 - 100 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 67e is a pipeline valve for tank mounting capable of handling large volumes. NV 67e is a pipeline valve with tank connecting flange for vertical flow. The valves are made from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
example: float valve Z/o (inlet valve for vertical flow upwards)

Standard

» float bar stainless steel
» cylindrical float SC 8 stainless steel
» quick-release body clamp ring

Options

» various seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]							
nominal diameter DN							
15	20	25	40	50	65	80	100
4	5	6	20	32	50	80	100

Float Valves

Float Valves for external installation on tanks NV 67e

Level Regulating Valve

Materials	
Body	CrNiMo-steel
Cone, Seat	CrNiMo-steel
Piston, Spindle	CrNiMo-steel
Valve Seal	EPDM
Linkage	CrNiMo-steel
Float Rod	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm]								
size	nominal diameter DN							
	15	20	25	40	50	65	80	100
A	160	160	160	200	230	290	310	350
B	185	185	185	220	220	317	317	317
C	125	125	125	145	145	211	211	211
F	210	210	210	280	280	420	420	420
G	30	30	30	40	40	60	60	60
H	DN100	DN100	DN100	DN125	DN125	DN200	DN200	DN200

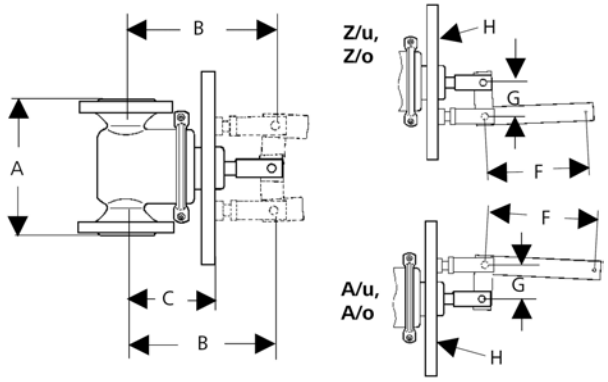
Weights [kg]							
nominal diameter DN							
15	20	25	40	50	65	80	100
5.8	6.2	6.5	14	14.5	28.5	30.5	31.5

Cylindrical Float ø SC 8 [mm] (ø = height) *								
nom. diam. DN	15	20	25	40	50	65	80	100
float ø mm	200	200	200	280	280	305	305	305

*dimensions and weights see sheet no. SC/2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



H = tank add-on flange

Float Valves

Float Valves for external installation on tanks NV 71

Direct Feed or Drain Valve

Technical Data

Connection DN	25 - 150
Nominal Pressure PN	10
Operating Pressure	0 - 8 bar
K_{vs}-Value	1.6 - 81 m^3/h
Temperature	300 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 71 is a pipeline valve for tank mounting complete with tank connecting flange for direct inlet/outlet. The valve cone can be fitted with a soft seal (up to 110 °C) or a metallic seal (up to 300 °C). The valve is supplied with a ball float type SC 3 fixed to the float bar.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
o = upward flow
u = downward flow
r = includes sealed spindle
example: float valve Z/o (inlet valve for vertical flow upwards)

Standard

» SC 3 ball float stainless steel

Options

» stainless steel construction – all components stainless steel
» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» special connections: ANSI or JIS flanges, other connections on request
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar], K_{vs}-Values [m^3/h]

pressure range	nominal diameter DN								
bar	25	32	40	50	65	80	100	125	150
0 - 2	5.1	10	15	21	31	57		81	
0 - 4	3.3	5.1	8.7	12	20	35		49	
0 - 8	1.6	2.9	4.5	6.4	10	17		28	

Float Valves

Float Valves for external installation on tanks NV 71

Direct Feed or Drain Valve

Materials	
Body	steel optional CrNiMo-steel
Cone and Seat	chromium steel, Rg optional CrNiMo-steel
Cone Guide	grey cast iron optional CrNiMo-steel
Balve Seal	EPDM up to 110°C optional metallic up to 300°C
Linkage	steel optional CrNiMo-steel
Float	CrNiMo-steel

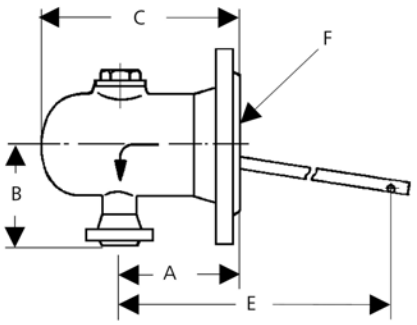
Dimensions [mm] and Weights [kg]									
size	nominal diameter DN								
	25	32	40	50	65	80	100	125	150
A	120	140	140	140	160	175	200	200	200
B	125	150	150	150	170	175	200	200	200
C	200	240	240	240	300	310	365	365	385
E	310	350	380	415	495	630	775	775	775
F	DN125	DN150	DN150	DN150	DN200	DN200	DN250	DN250	DN250
ball float SC 3									
ø	110	130	160	200	220	250	280	280	280
Weights									
kg	10	15	17	19	41	44	58	60	62

from DN 40 float fitted through manhole

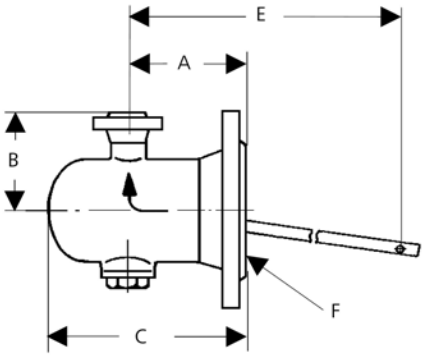
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

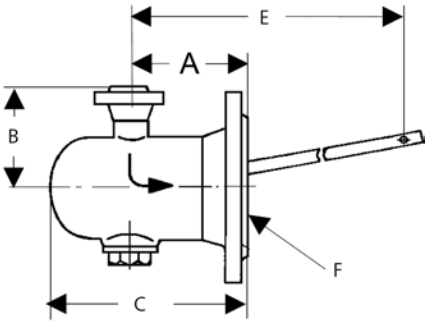
NV 71 A/u



NV 71 A/o



NV 71 Z/u



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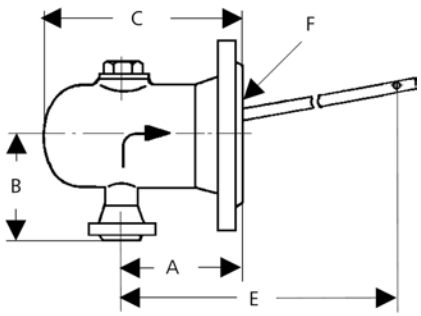


Float Valves

Float Valves for pipelines

Epoxy-coated Cast Valve			NV 15e
straightway or angle-type single-seat feed valve, balanced cone | suitable for water, especially for potable water | body made of GGG-50 with epoxy coating in accordance with the KTW Plastics and Drinking Water Guidelines | including stainless steel float and rod			
DN	40 - 300	PN	16
p	0 - 16 bar	K_{vs}	18 - 900 m^3/h
T	70 °C		

Cast Steel Valve for High Flow Rates			NV 16
single-seat, straight-way valve for feeding or draining | body made of GGG-40, GS-C25, CrNiMosteel | incl. float rod made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media			
DN	15 - 100	PN	16 - 40
p	0 - 4 bar	K_{vs}	2.6 - 80 m^3/h
T	130 °C		

Level Regulating Valve with Release			NV 16e
single-seat, straight-way valve with release for feeding or draining | body made of GS-C25 or CrNiMo-steel | incl. float rod and shell-type float made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media			
DN	15 - 150	PN	16 - 40
p	0 - 16 bar	K_{vs}	4 - 160 m^3/h
T	130 °C		

Double Seat Level Control Valve			NV 26
double-seat, straight-way valve for feeding or draining, large flow rates and nominal diameters | body made of GGG-40, GS-C25, CrNiMo-steel | incl. float rod and shell-type float made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media			
DN	125 - 400	PN	10 - 40
p	0 - 16 bar	K_{vs}	46 - 1800 m^3/h
T	130 °C		

Level Regulating Valve			NV 66e
single-seat, balanced straight-way valve for feeding or draining, large flow rates | usable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | incl. float rod and shell-type float made of CrNiMo-steel			
DN	15 - 100	PN	16
p	0 - 16 bar	K_{vs}	4 - 100 m^3/h
T	130 °C		

Float Valves

Float Valves for pipelines

Valves for Systems Fitted with Accumulator			NV 80, 82
Compressed air shutoff valve for water supply systems fitted with accumulator, NV 80 of angled design | suitable for liquids | body made of steel, CrNiMo steel			
DN	15 - 200	PN	16
p	up to 8 bar	Q	1 - 115 m^3/h
T	110 °C		

Know How Float Valves

Level controllers and float valves control the liquid level in a vessel

Level controller or float valve
You should use a level controller with float chamber if the float cannot be mounted in the vessel. It is mounted in the pipeline and connected to the vessel by means of balancing lines.
Float valves have no float chamber. The float is always mounted in the vessel.

Feed and drain valves
Feed valves (code letter "Z") close as the float rises and prevent overflowing. Drain valves (code letter "A") close as the float sinks and ensure that the liquid level does not drop below the required level.

Mounting of float-controlled valves
- Float valves for installations in vessels are mounted inside the vessel complete with float.
- Float valves for installation on vessels are flange- mounted on the outer skin of the vessel.
- Float valves for installation in pipe lines are installed in the feed/drain pipe.
The float lever either projects into the vessel or the float movemen´s is transferred by means of a cable.

Flow direction of float valves
The flow direction determines the mounting arrangement and type of float lever used:
- horizontal, flow direction towards or away from the vessel code letter "w"
- vertical, flow direction upwards code letter "o")
- vertical, flow direction downwards (code letter "u")

Selecting valve type and nominal diameter
To select the valve type and determine the required nominal diameter you should calculate first the operating performance parameter K_v based on the maximum operating values and minimum pressure drop Dp. You should choose a valve having a K_{vs} value which is 30 % greater than the calculated K_v figure.

Selecting the operating pressure range
The maximum operating pressure of your system must be within the operating pressure range of the valve; if not, the float valve will not close or open.

Pressure inside the vessel
Check whether the vessel in which the float is to be mounted is not pressurised. If the vessel is pressurised a pressure-resistant ball float has to be fitted. Cylindrical floats may only be used in non-pressurised vessels.

Temperature
If the valve is to be used for temperatures above 80 °C or a liquid other than water, the compatibility of the elastomers must be checked. For hydrocarbons like gasoline, petrol etc., for example, the valves are fitted with FPM elastomers, whilst for higher temperatures they are fitted with EPDM or, if necessary, with a metallic cone seal.

Adapting the float
Float valves are normally designed for media with the specific gravity of water. By choosing a different float geometry, by filling the float or by altering the operating pressure range, we can adapt the floats to other media.

Balance and double seat
Single seat non-balanced float valves are used for low pressures. They are relatively insensitive to contamination and dirt deposits.
Single seat balanced valves can be used for larger pressure drops and feature smaller floats.
Double seat valves are specially suitable for large flow rates.

Overflow preventers
A special product are the PTB-approved overflow preventers Types 36S and 36SF. These are mechanical safety devices for flammable liquids.

Seat leakage
Level controllers and float valves are control valves which are not required to provide a leak-proof seal (VDI/VDE Guideline 2174). For leakproof shutoff, shut-off valves must be used. Normally our valves leave the factory with perfectly leakproof valve seats. During operation, however, solid particles (e.g. sand, welding nuggets etc.) often cause damage and seat leakage. Any low leakage requirement must be expressly specified when ordering. Valve leakage can be considerably reduced by special measures such as lapping the valve seat, using special cone seals and increasing the valve closing force by changing the lever geometry or increasing the size of the float.

Adjustable filling level
In the case of valves fitted with float rod and adjustable float, the level in the vessel can be adjusted by sliding the float along the rod.

Float rod guide
For float rods a guide must be provided in the vessel to prevent the float oscillating. Float valves with parallel guide or special designs featuring a top-mounted float do not require a rod guide.

Operation
Make sure that no pressure surges or water hammer occur in the system, which could destroy the float. In the case of foaming media and the resulting reduction of the specific gravity, a float valve cannot operate reliably. In this case a foam abatement circuit should be provided.

Maintenance
Float valves and level controllers should be cleaned and serviced at regular intervals. This rule applies especially to valves which are rarely operated e.g. valves fitted in sprinkler systems.
Thorough cleaning is important in the case of liquids containing substances which easily form deposits (such as iron, lime, suspended solids etc). Sand and abrasive particles carried along in the liquid can cause rapid wear. Please ask for specially adapted valves.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

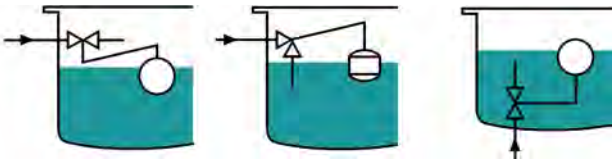
Notes on Safety, operarting instruction etc. MUST be followed

Know How Float Valves

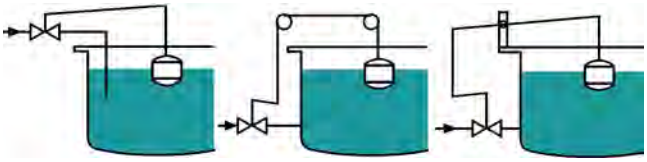
Level controllers and float valves control the liquid level in a vessel

Sample for installation for inflow valves

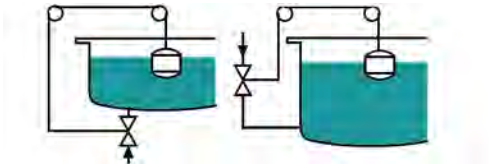
for installation in vessels



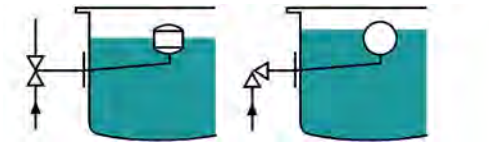
for installation in pipelines, horizontal installation



for installation in pipelines, vertical installation



for installation at tanks



overflow preventer for flammable liquids

Selection Float Valves

for installation in pipelines

flow			operating press. bar	K_{VS}-value m^3/h	connection			SS	notes	type
W	S	E			G	DN	*			
•	•		4	3 - 80		15 - 100			economical valve up to 4 bar	16
•	•		16	4 - 100		15 - 100	*	•	economical stainless steel valve, single seat, balanced	66e
•		•	16	18 - 900		40 - 300			epoxy-coated cast valve for water	15e
•	•		40	4 - 160		15 - 150			standard valve, single seat, balanced	16e
•	•		40	46 - 1800		125 - 400			double seat	26

compressed air shutoff valves

flow			operating press. bar	K_{VS}-value m^3/h	connection			SS	notes	type
W	S	E			G	DN	*			
		•	8	2 - 510		15 - 200			safety device for waterworks with pressure vessel (compressed air)	80
	•		8	2 - 510		15 - 200			safety device for waterworks with pressure vessel (compressed air)	82

* other connections available, • stainless steel deep drawn

W = horizontal flow
S = vertical flow
E = angled flow

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Float Valves

Float Valves for pipelines NV 15e

Epoxy-coated Cast Valve

Technical Data

Connection DN	40 - 300
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
K_{vs}-Value	18 - 900 m³/h
Temperature	70 °C
Medium	water, especially potable water

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 15e is a straightway or angle-type single-seat feed valve with relieved cone, the cone is fitted with a soft seal. The valves are approved for the use with potable water thanks to the coating of the body in accordance with the KTW guidelines.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The valves are equipped with a float rod that is height-adjustable through the lever. Thus the fluid level can be steplessly adjusted.

Standard

» body coated with epoxy in accordance with the KTW guidelines
» float rod made of CrNiMo steel
» up to DN 65 ball float made of CrNiMo steel
from DN 80 shell-type float with internal pipe made of CrNiMo steel

Options

» float lever made of CrNiMo steel
» EPDM seals
» connection for frost protection G 3/8
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs} Values [m³/h]					
nominal diameter DN	40	50	65	80	100
m³/h	18	18	40	60	90

K_{vs} Values [m³/h]					
nominal diameter DN	125	150	200	250	300
m³/h	140	200	320	600	900

Float Valves

Float Valves for pipelines NV 15e

Epoxy-coated Cast Valve

Werkstoffe	
Body and Cover	spherodial cast iron Epoxy-coated*
Guide Bush	brass /steel/stainless steel
Cone and Seat	stainless steel
Cone Guide	stainless steel / PTFE
Valve Seal	NBR
Linkage	stainless steel
Float	stainless steel

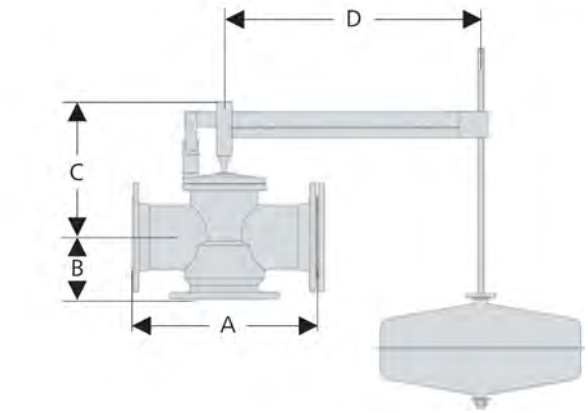
Dimensions [mm] and Weights [kg] PN 10/16*										
size	nominal diameter DN									
	40	50	65	80	100	125	150	200	250	300
A	230	230	290	310	350	400	480	600	730	850
B	82,5	82,5	92,5	100	125	125	162	183	270	300
C	173	173	193	212	225	230	351	380	540	610
D	600	600	600	800	800	800	1000	1000	1220	1400
kg	21	21	25.6	32.6	41	49	78.5	118	162	250

Float Dimensions [mm]										
size	nominal diameter DN									
	40	50	65	80	100	125	150	200	250	300
ø	220	220	220	300	400	400	400	400	500	500
height				200	180	180	250	250	300	400

up to DN 65 with ball float
from DN 80 with cylindrical float

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for pipelines NV 16

Cast Steel Valve for High Flow Rates

Technical Data

Connection DN	15 - 100
Nominal Pressure PN	16 - 40
Operating Pressure	0 - 4 bar
K_{vs}-Value	2.6 - 80 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 16 is a pipeline valve for horizontal or vertical flow. The standard soft seal ensures perfect sealing of the valve.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
r = includes sealed spindle
example: float valve Z/w (inlet valve for horizontal flow).

Standard

» float bar 1m length of stainless steel

Options

» float bar in special length
» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Ranges [bar] and K_{vs}-Values [m^3/h]

press. range bar	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
0 - 1	2.6	3.5	3.5	5.7	7.6	15	27	47	80
0 - 4	2.6	3.5	3.5	5.7	7.6	7.6	15	27	47

Float Valves

Float Valves for pipelines NV 16

Cast Steel Valve for High Flow Rates

Materials	
Body	cast steel optional CrNiMo-Steel
Cone and Seat	Cr-steel optional CrNiMo-steel
Cone Guide	Rg optional CrNiMo-steel
Valve Seal	EPDM
Linkage	steel zinced or steel, optional CrNiMo-steel
Float Rod	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm] and Weights [kg] PN 10/16*

size	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
A	130	150	160	180	200	230	290	310	350
B	175	175	175	195	195	195	290	290	290
C	55	55	55	125	125	125	105	105	105
D	360	360	360	480	480	480	640	640	640
E	270	270	270	360	360	360	480	480	480
F	315	315	315	420	420	420	560	560	560
G	45	45	45	60	60	60	80	80	80
kg	6	7	8	11	14	19	40	48	60

*PN 25/40 on request

necessary Cylindrical Float ø SC 8 [mm] (ø = height)*

press. range bar	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
0 - 1	200	200	200	200	200	240	280	280	305
0 - 4	240	240	240	240	280	280	305	340	420

*dimension and weights see sheet no. SC/2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
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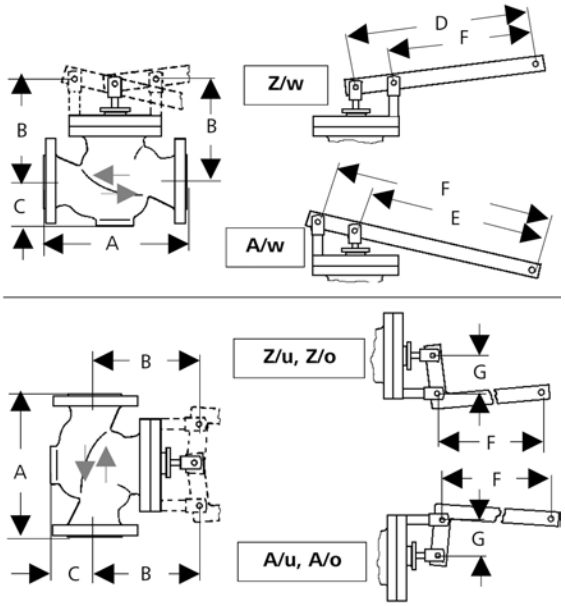
Dimensional Drawing



Float Valves

Float Valves for pipelines NV 16e

Level Regulating Valve with Release

Technical Data

Connection DN	15 - 150
Nominal Pressure PN	16 - 40
Operating Pressure	0 - 16 bar
K_{vs}-Value	4 - 160 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 16e is a pipeline valve for horizontal or vertical flow. The valve cone is fitted with a soft seal.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
r = includes sealed spindle
example: float valve Z/w (inlet valve for horizontal flow).

Standard

» float bar 1m length of stainless steel
» cylindrical float SC 8 stainless steel

Options

» float bar in special length
» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

K_{vs}-Values [m^3/h]					
nom. diam. DN	15	20	25	40	50
K_{vs}-value m^3/h	4	5	6	20	32

K_{vs}-Values [m^3/h]					
nom. diam. DN	65	80	100	125	150
K_{vs}-value m^3/h	50	80	100	140	160

Float Valves

Float Valves for pipelines NV 16e

Level Regulating Valve with Release

Materials	
Body	cast steel optional CrNiMo-steel
Cone and Seat	grey cast iron, CR-steel
Piston and Spindle	chromium steel optional CrNiMo-steel
Valve Seal	EPDM
Linkage	steel zinced or steel
Flot Rod	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm] and Weights [kg] PN 16*										
size	nominal diameter DN									
	15	20	25	40	50	65	80	100	125	150
A	130	150	160	200	230	290	310	350	400	480
B	175	175	175	195	195	290	290	290	325	400
C	55	55	55	125	125	105	105	105	185	200
D	360	360	360	480	480	640	640	640	760	895
E	270	270	270	360	360	480	480	480	570	675
F	315	315	315	420	420	560	560	560	665	785
G	45	45	45	60	60	80	80	80	95	110
weights without float										
kg	8	9	10	17.5	22.5	44.5	52.5	64.5	93	123

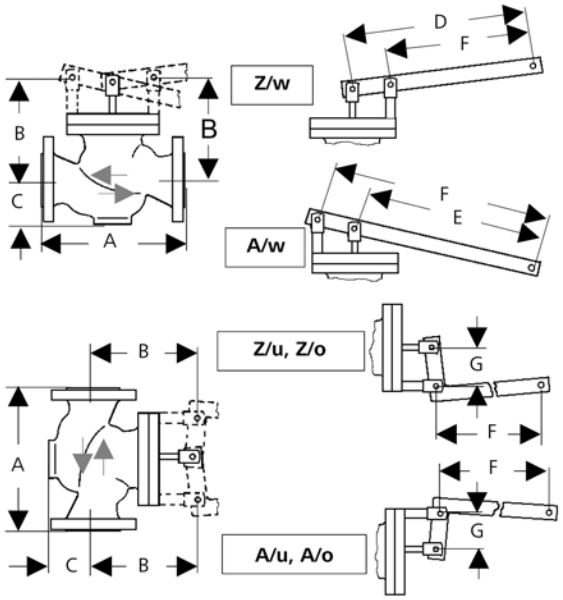
* PN 25/40 on request

Cyllindrical Float ø SC 8 [mm] (ø = height) *										
nom. diam. DN	15	20	25	40	50	65	80	100	125	150
float ø mm	200	200	200	280	280	305	305	305	340	340

*dimensions and weights see sheet SC 2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for pipelines NV 26

Double Seat Level Control Valve

Technical Data

Connection DN	125 - 400
Nominal Pressure PN	10 - 40
Operating Pressure	0 - 16 bar
K_{vs}-Value	46 - 1800 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 26 is a pipeline valve for horizontal or vertical flow. The standard soft seal ensures perfect sealing of the valve.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
r = includes sealed spindle
example: float valve Z/w (inlet valve for horizontal flow).

Standard

» float bar stainless steel

Options

» rubber or plastic coating for corrosive media
» various seal materials suitable for your medium
» special versions on request

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Pressure Range [bar] and K_{vs}-Values [m^3/h]

press. range bar	nominal diameter DN						
	125	150	200	250	300	350	400
0 - 1	140	230	380	570	1000	1000	1800
0 - 4	84	140	230	380	570	570	1000
0 - 16	46	84	140	230	380	380	570

Float Valves

Float Valves for pipelines NV 26

Double Seat Level Control Valve

Materials		
Body	PN 10 - 16	spherodial cast iron or cast steel
	PN 25 - 40	cast steel
	PN 16 - 40	optional CrNiMo-steel *
Cone and Seat		Cr-steel optional CrNiMo-steel
Cone Guide		Rg optional CrNiMo-steel
Valve Seal		EPDM
Linkage		steel zinced or steel optional CrNiMo-steel

Dimensions [mm] and Weights [kg] PN 10/16*							
size	nominal diameter DN						
	125	150	200	250	300	350	400
A	400	480	600	730	850	980	1100
B	325	400	440	490	540	540	555
C	185	200	210	250	290	290	385
D	760	895	1120	1280	1440	1440	1600
E	570	675	840	960	1080	1080	1200
F	665	785	980	1120	1260	1260	1400
G	95	110	140	160	180	180	200
kg	93	128	198	276	480	535	690

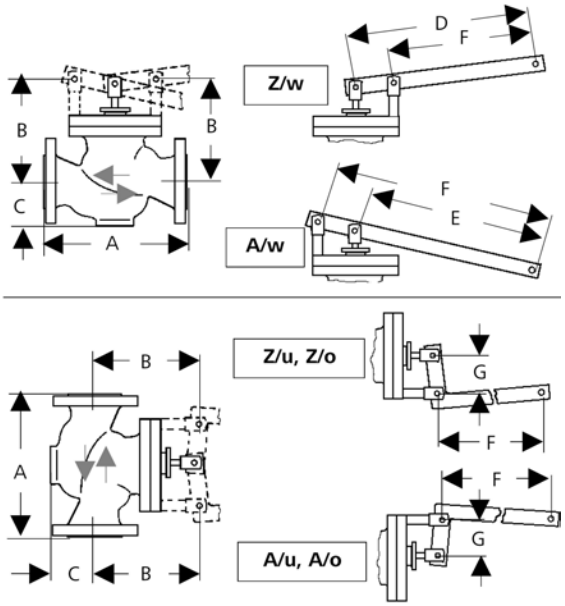
*PN 25/40 on request

Necessary Cylindrical Float ø SC 8 [mm] (ø = height)*							
press. range bar	nominal diameter DN						
	125	150	200	250	300	350	400
0 - 1	240	305	305	340	380	380	380
0 - 4	280	340	340	380	420	420	460
0 - 16	380	420	460	500	600	600	600

*dimension and weights see sheet no. SC/2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for pipelines NV 66e

Level Regulating Valve

Technical Data

Connection DN	15 - 100
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
K_{vs}-Value	4 - 100 m^3/h
Temperature	130 °C
Medium	liquids

Description

Float valves automatically control liquid levels in sealed or open (non-pressurised) tanks and vessels without requiring external energy. The float registers the liquid level and directly controls the valve via a lever. A change in the liquid level immediately results in a changed flow volume.

NV 66 is a pipeline valve for tank mounting capable of handling large volumes. NV 66e is a pipeline valve for horizontal or vertical flow. The valves are made from deep-drawn stainless steel featuring excellent corrosion resistance. The valve cone is fitted with a soft seal.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The valves are fitted with a float bar on which a float featuring an inner tube is mounted. By changing the position of the float on the bar the required liquid level is infinitely variable.

The following note applies to float valves fitted with float bars: If the liquid level is below the float bar i.e. if the float points downwards, a guide for the float bar should be installed.

When enquiring or ordering please quote the suffix letters given below:
Z = inlet. Valve closes when float rises
A = outlet. Valve closes when float drops
w = horizontal flow
o = upward flow
u = downward flow
r = includes sealed spindle
example: float valve Z/w (inlet valve for horizontal flow).

K_{vs}-Values [m^3/h]							
nominal diameter DN							
15	20	25	40	50	65	80	100
4	5	6	20	32	50	80	100

Standard

- all stainless steel construction
- float bar stainless steel
- cylindrical float SC 8 stainless steel
- quick-release body clamp ring

Options

- various seal materials suitable for your medium
- special connections: ANSI or JIS flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Float Valves

Float Valves for pipelines NV 66e

Level Regulating Valve

Materials	
Body	CrNiMo-steel
Cone, Seat	CrNiMo-steel
Piston, Spindle	CrNiMo-steel
Valve Seal	EPDM
Linkage	CrNiMo-steel
Float Rod	CrNiMo-steel
Float	CrNiMo-steel

Dimensions [mm]								
size	nominal diameter DN							
	15	20	25	40	50	65	80	100
A	160	160	160	200	230	290	310	350
B	185	185	185	220	220	325	325	325
D	360	360	360	480	480	640	640	640
E	270	270	270	360	360	480	480	480
F	315	315	315	420	420	560	560	560
G	45	45	45	60	60	80	80	80

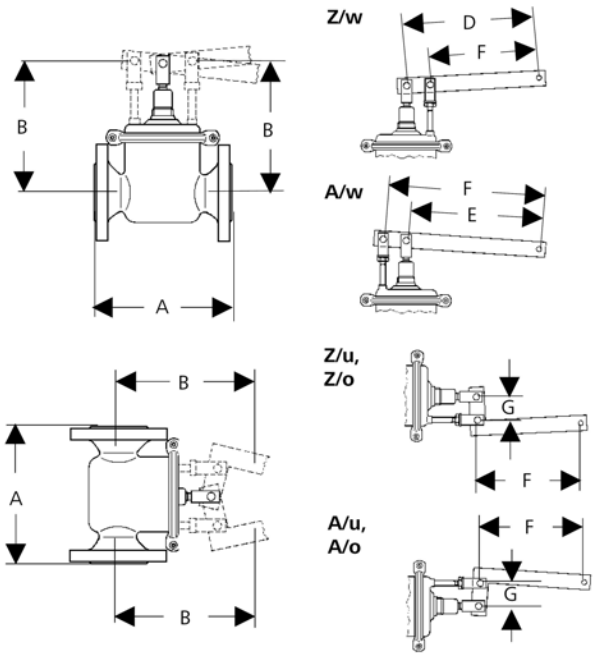
Weights [kg]							
nominal diameter DN							
15	20	25	40	50	65	80	100
5.8	6.2	6.5	14	14.5	28.5	30.5	31.5

Cylindrical Float ø SC8 [mm] (ø = height) *								
nom. diam. DN	15	20	25	40	50	65	80	100
float ø mm	200	200	200	280	280	305	305	305

*dimensions and weights see sheet no. SC/2.1....

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Float Valves

Float Valves for pipelines NV 80, 82

Valves for Systems Fitted with Accumulator

Technical Data

Connection DN	15 - 200
Nominal Pressure PN	16
Operating Pressure	up to 8 bar
Flow Rate	1 - 115 m^3/h
Temperature	110 °C
Medium	water

Description

Pneumatic shutoff valves are independent stop valves for water installations fitted with accumulators. These valves prevent air escaping from accumulators into the pipe network once a pump has failed owing to lack of water, power cut, pipe blockage etc. In this way dangerous water hammer in the pipe network and loss of compressed air is prevented.

The accumulator must be installed in a pipe spur. As long as the accumulator is filled with water up to the level of the lower connecting spigot, the float of the pneumatic shutoff valve keeps the valve open in both directions if there is a flow of water. As soon as air passes from the accumulator into the pneumatic shutoff valve the latter closes tightly preventing air entering the pipe network. When the pump starts delivering the pneumatic shutoff valve automatically opens again and allows water to flow into the accumulator. When the water level is rising the pneumatic shutoff valve will open only if the pressure inside and downstream of the valve is approximately zero. The water flow velocity in the valve must not exceed 1.5 m/s (1 m/s for valve size DN 200).

NV 80 is a pneumatic shutoff valve of angled design, whereas NV 82 is a straight valve. The valve body is of welded steel construction; the float is precisely guided in two bushes; the valve cone is fitted with a soft seal.

Options

- stainless steel construction – all components stainless steel
- rubber or plastic coating for corrosive media
- various seal materials suitable for your medium
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Flow Rate [m^3/h]					
nominal diameter DN					
15	20	25	32	40	50
1	3	3	7	7	11

Flow Rate [m^3/h]					
nominal diameter DN					
65	80	100	125	150	200
18	27	42	68	100	115

Float Valves

Float Valves for pipelines NV 80, 82

Valves for Systems Fitted with Accumulator

Materials	
Temperature	80 °C
Body	steel optional CrNiMo-steel
Body Seal	Nova Universal
Internals	Cr-steel optional CrNi-steel or CrNiMo-steel
Float	CrNi-steel optional CrNiMo-steel
Valve Seal	EPDM

Dimensions [mm] NV 80, NV 82 PN 10						
size	nominal diameter DN					
	15	20	25	32	40	50
A_1	300	300	300	360	370	390
A_2	320	320	320	355	360	360
B	60	65	75	85	100	120
D	285	285	285	285	285	285

Dimensions [mm] NV 80, NV 82 PN 10						
size	nominal diameter DN					
	65	80	100	125	150	200
A_1	500	540	680	720	875	900
A_2	460	475	580	580	700	800
B	130	165	205	245	285	310
D	340	340	395	395	445	505

Dimensions [mm] NV 80, NV 82 PN 16						
size	nominal diameter DN					
	15	20	25	32	40	50
A_1	300	300	300	360	370	390
A_2	320	320	320	355	360	360
B	60	65	75	85	100	120
D	285	285	285	285	285	285

Dimensions [mm] NV 80, NV 82 PN 16						
size	nominal diameter DN					
	65	80	100	125	150	200
A_1	500	540	680	720	875	900
A_2	460	475	580	580	700	800
B	130	165	205	245	285	310
D	340	340	405	405	460	520

Weights [kg] NV 80, NV 82						
nominal pressure	nominal diameter DN					
	15	20	25	32	40	50
PN 10	26	26.5	27	29.5	30	31
PN 16	26	26.5	27	29.5	30	31

Weights [kg] NV 80, NV 82						
nominal pressure	nominal diameter DN					
	65	80	100	125	150	200
PN 10	57	59	103	108	137	153
PN 16	57	59	106	112	148	164

Special designs on request.
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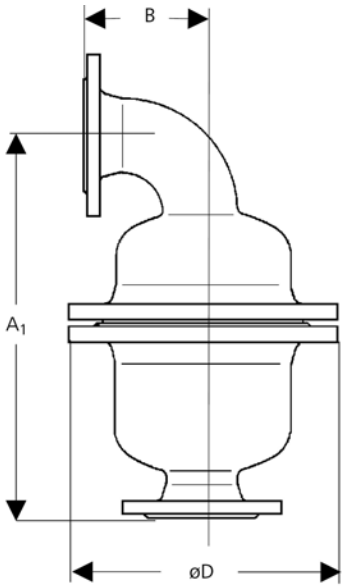
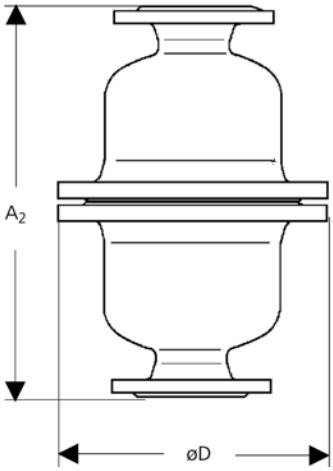
Dimensional Drawing

NV 80



NV 82



Pipeline Ancillaries

Strainers and Filters

Gasfilter for High Pressures			FI 1.01
Gas filter with low pressure drop for high pressures | polyester foam mat, pore size 0.15–0.58 mm | body made of GG-25, GGG-40, GS-C 25 | different filter finenesses | optionally with manometer			
DN	15 - 250	G	3/8 - 2
PN	16 - 160	T	80 °C

Stainless Steel Gas Filter			FI 6.01
low pressure drop, filter medium made of polyester foam, pore size 0.15–0.58 mm | usable for gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design			
DN	15 - 100	G	1/2 - 2
PN	16	T	80 °C

Stainless Steel Filter			FI 6.06
especially suitable for sterile steam, filter insert of sintered steel or pleated stainless steel mesh, filter fineness 5, 20 or 25 µm | usable for gases, steam, compressed air | completely made of deep-drawn CrNiMo steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design			
DN	15 - 50	G	1/2 - 2
PN	16	T	190 °C

Pot Strainers for High Pressures			SF 1.00
pot strainer with low pressure drop for high pressure | mesh width 0.25–2.5 mm | body made of GG-25, GGG-40, GS-C 25 | different sieve finenesses | optionally with manometer			
DN	15 - 150	G	3/8 - 2
PN	16 - 160	T	PN 16 up to 110 °C PN 25 - 160 up to 200 °C

Pot Strainers for Large Nominal Diameters			SF 2.00
low pressure drop, different sieve finenesses, clear mesh width 0.25–2.5 mm | usable for liquids, gases and steam | body made of steel, CrNiMo-steel | very sturdy welded construction of steel or CrNiMo-steel, specific customised versions available			
DN	25 - 1000	PN	6 - 100
T	200 °C		

Pipeline Ancillaries

Strainers and Filters

Strainer for Very High Pressures			SF 3.00
strainer made of forged steel in block design, low pressure drop, different sieve finenesses, clear mesh width 0.25–2.5 mm | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special material such as Duplex, Superduplex, Hastelloy® or titanium available | optionally with manometer connection			
DN	15 - 100	PN	160 - 500
T	550 °C		

Stainless Steel Pot Strainer			SF 6.00
flat sieve with low pressure drop, different sieve finenesses, clear mesh width 0.25–2.5 mm | usable for liquids, gases and steam | completely made of CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design			
DN	15 - 100	G	1/2 - 2
PN	16	T	130 °C

Know How Strainers and Filters

Strainers and filters protect plant, plant components and equipment against damage and malfunctioning caused by contamination

In what cases should a strainer be installed
After a pipeline system or plant has been commissioned, equipment or valves have been installed or repaired or pipes have been installed or welded, it may well be that dirt, welding nuggets, bits of sealing materials etc. have entered the system. Even during operation particles lodged in the pipes or fittings can become detached. These can cause malfunctioning by blocking small orifices or by forming deposits in control valves etc. For this reason we recommend that you should install strainers, gas filters or filters upstream of any equipment, control valves or fittings which may be at risk.
Even clean media such as sterile steam require suitable filter.
To protect our own pressure and flow control valves we always recommend fitting an upstream strainer or filter. This applies especially to regulating valves with small seat diameters i.e. small Kvs values.
Mankenberg fit such protection devices to the pilot valves of pilot-controlled valves as standard equipment.

Selection
The type of strainer to be selected depends on the medium and temperature.
- Liquids
Strainers featuring one or more layers of mesh are particularly well suited for liquids. The mesh size depends on the downstream equipment. The smaller the control or measuring orifices, the finer must be the mesh size.
- Gases
For gases we use gas filters featuring non-woven filter fabric or, if a high degree of purity is required, a cartridge-type filter. As with strainers, the retained particle size of the filter is governed by the requirements of the downstream equipment.
- Steam
Our filter FI 6.06 is especially suitable for sterile and clean steam. Filter cartridges offering various retained particle sizes may be fitted.

Limits of application
Owing to the use of a synthetic fibre filter medium, the maximum temperature for gas filters is limited to 80 °C. Filter 6.06 is designed for temperatures up to 190 °C. Strainers must be used for all media exceeding this temperature.

Selecting valve type and nominal size
You must first ask which pressure drop is acceptable. If this is not all that important you should select the simplest equipment. In the case of strainers this is type 1.22 in Y-form. If the pressure drop is important you should select the pot-type. With this type the mesh area which is relatively large compared with the nominal diameter, produces a considerably smaller pressure drop than a Y-type strainer with its small circular strainer mesh.
By using the Design Data sheet you can calculate the flow resistance. The flow resistance is a function of the retained particle size of the mesh or filter cartridge and of the mesh area. With strainers the larger nominal diameters feature larger mesh areas i.e. smaller pressure drops. If the calculated pressure loss should prove to be excessive you should check whether a larger mesh size can be used; if not, select a larger nominal diameter.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, operating instructions etc. MUST be followed

Selection Filters and Strainers

MANKENBERG

Strainer

T °C	PN	connection			SS	notes	type
		G	DN	*			
400	16 - 160	3/8 - 2	15 - 150			pot design with minimised pressure drop, body cast iron or cast steel	1.00
400	16 - 40		15 - 400			Y-design, economical valve	1.22
300	6 - 40		25 - 600	*		pot design with minimised pressure drop, body steel welded	2.00
550	160 - 400	3/8 - 2	15 - 100	*		high pressure design with welding ends or socket weld ends	3.00
130	16	1/2 - 2	15 - 100	*	•	economical stainless steel valve	6.00

Screen netting for SF 1.00, SF 2.00, SF 3.00, SF 6.00

light screen aperture [mm]	open screan area [%]
0.25	41
0.5	51
1	67
2.5	69

Screen netting for SF 1.22

nominal diameter DN	light screen aperture standard screen [mm]	light screen aperture fine screen [mm]
15 + 20	0.5	0.25
25 - 65	0.75	0.25
80 - 200	1.2	0.25
250 - 400	2.2	0.25

Filter

T °C	PN	connection			SS	notes	type
		G	DN	*			
80	16 - 160	3/8 - 2	15 - 150			pot design with minimised pressure drop, body cast iron or cast steel	1.01
80	16	1/2 - 2	15 - 100	*	•	economical stainless steel valve	6.01
190	16	1/2 - 2	15 - 50	*	•	filter also for clean steam and for sterile applications	6.06

* other connections available, •stainless steel deep drawn

Filter mats for FI 1.01 andFI 6.06

nominal diameter	size of pores[mm]		
	mat 1	mat 2	mat 3
G 3/8 - 2	0.265	-	-
DN 15 - 50	0.265	-	-
DN 65 - 125	0.37	0.265	-
DN 150	0.58	0.37	0.265

Filter insert for FI 6.06

design	kind of filter	filter [µm]
sintered	standard	20
sintered	fine	5
3 layers	standard	25
3 layers	fine	5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pipeline Ancillaries

Strainers and Filters FI 1.01

Gasfilter for High Pressures

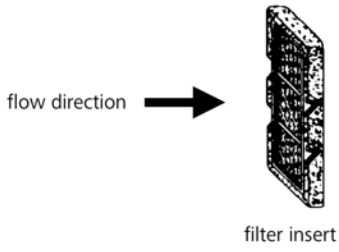
Technical Data

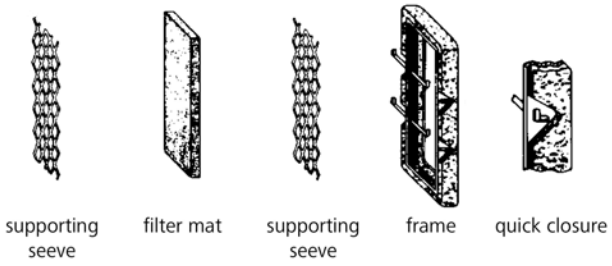
Connection DN	15 - 250
Connection G	3/8 - 2
Nominal Pressure PN	16 - 160
Temperature	80 °C
Medium	gases

Description

Gas filters protect plants and equipments such as regulators, valves, measuring equipment, safety valves and burners against damage or operational failure caused by contamination. They are essential for start-up as well as continuous operation. In systems equipped with multiple tube filters they may be used as a bypass filter instead of costly additional standby filters.

Cleaning is extremely simple and quick thanks to the quick-release locking of the filter element.





Installation can be carried out in any position; installation with the cover at the bottom is recommended.

Standard

- » filter medium made of skeletal polyester foam (for pore size and number of sheets see tables on right)
- » stainless steel support frame fitted with quick-release locking

Options

- » filter medium in various pore sizes (see table on right)
- » pressure gauges upstream and downstream of the filter element
- » various seal materials suitable for your medium
- » special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Filter Mat			
mat no.	size of pores mm	dust restraint capacity with testdust, limit grain 0.005 mm	
80 (special)	0.150	clean	71%
		medium	85%
		dirty	91%
60	0.265	clean	63%
		medium	78%
		dirty	86%
45	0,370	clean	56%
		medium	72%
		dirty	82%
30	0.580	clean	55%
		medium	65%
		dirty	70%

Number if Filter Mats			
nominal diameter			
G 3/8 - 2	DN 15 - 50	DN 65 - 125	DN 150 - 250
1 x Nr. 60	1 x Nr. 60	1 x Nr. 60 1 x Nr. 45	1 x Nr. 60 1 x NR. 45 1 x Nr. 30

Pipeline Ancillaries

Strainers and Filters FI 1.01

Gasfilter for High Pressures

Materials		
Body	PN 16	up to G 1, DN 25 grey cast iron from G 1 1/4, DN 32 spherodial cast iron
	PN 25 - 160	cast steel
Seal		Nova Universal
Filter Mat		polyesterfoam with skeleton construction
Supporting Frame		CrNiMo-steel

Dimensions [mm] flange connection

size	PN	nominal diameter DN										
		15	20	25	32	40	50	65	80	100	125	150
A	16	-	150	160	180	200	230	290	310	350	400	400
	40	196	200	-	244	-	-	-	-	-	-	-
	63/160	210	230	-	-	-	-	-	-	-	-	-
B	16	-	110	125	130	135	150	170	160	190	250	275
	40	120	120	-	130	-	-	-	-	-	-	-
	63/160	120	145	-	-	-	-	-	-	-	-	-
C	16	-	160	185	215	220	255	285	275	345	410	490
	40	170	170	-	215	-	-	-	-	-	-	-
	63/160	170	200	-	-	-	-	-	-	-	-	-
øD	16	-	110	140	140	170	170	210	220	255	320	350
	40	110	110	-	140	-	-	-	-	-	-	-
	63/160	110	150	-	-	-	-	-	-	-	-	-
E	16 - 160	-						G 1/2			G 1	
F	16 - 160	G 1/4									G 1/2	

Weights [kg] flange connection

nominal pressure PN	nominal diameter DN										
	15	20	25	32	40	50	65	80	100	125	150
16	-	4.5	6	8.5	12.5	16.5	25	30	46	67	90
40	5.5	6.5	-	11	-	-	-	-	-	-	-
63/160	8	16	-	-	-	-	-	-	-	-	-

Dimensions [mm] BSP female connection

size	PN	nominal diameter G						
		3/8	1/2	3/4	1	1 1/4	1 1/2	2
A	16	90	90	120	140	140	170	170
	40	120	120	120	-	160	-	-
	63/160	120	120	120	-	-	-	-
B	16	65	65	110	125	130	135	150
	40	120	120	120	-	130	-	-
	63/160	120	120	120	-	-	-	-
C	16	120	120	165	185	215	220	255
	40	170	170	170	-	215	-	-
	63/160	170	170	170	-	-	-	-
øD	16	65	110	110	140	140	170	170
	40	110	110	110	-	140	-	-
	63/160	110	110	110	-	-	-	-
E	16 - 160	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4

Weights (kg) BSP female connection

PN	nominal diameter G						
	3/8	1/2	3/4	1	1 1/4	1 1/2	2
16	1.5	1.5	3	4	5	7.5	10.5
40	5	5	5	-	7	-	-
63	6	6	6	-	-	-	-
160	8	8	8	-	-	-	-

Special designs on request.
The pressure has always been indicated as overpressure.
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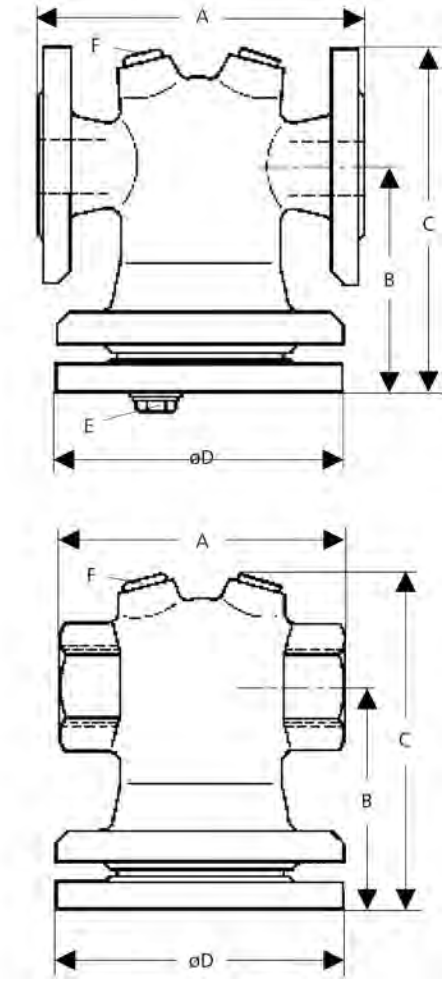
Dimensional Drawing



Pipeline Ancillaries

Strainers and Filters FI 6.01

Stainless Steel Gas Filter

Technical Data

Connection DN	15 - 100
Connection G	1/2 - 2
Nominal Pressure PN	16
Temperature	80 °C
Medium	gases

Description

Gas filters protect plants and equipments such as regulators, valves, measuring equipment, safety valves and burners against damage or operational failure caused by contamination. They are essential for start-up as well as continuous operation. In systems equipped with multiple tube filters they may be used as a bypass filter instead of costly additional standby filters.

FI 6.01 is entirely manufactured from deep-drawn stainless steel featuring excellent corrosion resistance.

Servicing/maintenance is easy and does not call for special tooling.

The filter may be installed in any position; installation with the cover at the bottom is recommended.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Installation can be carried out in any position; installation with the cover at the bottom is recommended.

Standard

- » filter medium made of skeletal polyester foam (for pore size and number of sheets see overleaf)
- » stainless steel support frame fitted with quick-release locking
- » quick-release body clamp ring

Options

- » filter medium in various pore sizes (see table on right)
- » various seal materials suitable for your medium
- » special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
- » special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Filter Mats

mat no.	size of pores mm	dust restraint capacity % with testdust, limit grain 0,005 mm	
80	0.150	clean	71%
		medium	85%
		dirty	91%
60	0.265	clean	63%
		medium	78%
		dirty	86%
45	0.370	clean	56%
		medium	72%
		dirty	82%

Number of Filter Mats

nominal diameter		
G 1/2 - 2	DN 15 - 50	DN 65 - 100
1 x no. 60	1 x no. 60	1 x no. 60 1 x no. 45

Pipeline Ancillaries

Strainers and Filters FI 6.01

Stainless Steel Gas Filter

Materials	
Body	CrNiMo-steel
Seal	EPDM
Filter Mat	polyesterfoam with skeleton construction
Supporting Frame	CrNiMo-steel
Profile Clamp	CrNiMo-steel

Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A_1*	110	110	110	110	110	160
B	105	105	105	105	105	105
C	155	155	155	155	155	155
D	140	140	140	140	140	140

* tolerance ± 2 mm

Weights [kg]					
nominal diameter G					
1/2	3/4	1	1 1/4	1 1/2	2
1.2	1.4	1.4	1.6	1.6	2.3

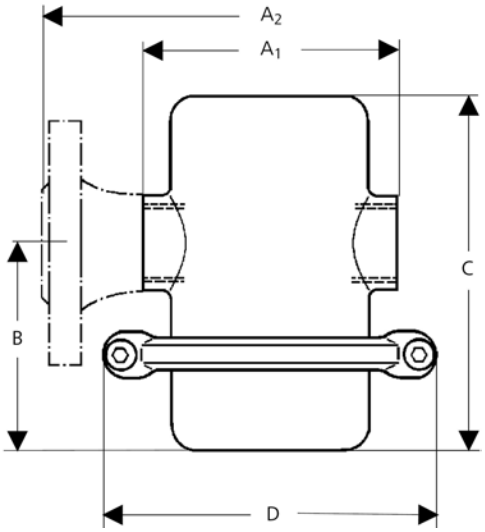
Dimensions [mm]									
size	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
A_2*	150	150	160	180	200	230	290	310	350
B	108	108	108	108	108	108	148	148	207
C	157	157	157	157	157	157	212	212	270
D	140	140	140	140	140	140	200	200	200

* tolerance ± 2 mm

Weights [kg]								
nominal diameter DN								
15	20	25	32	40	50	65	80	100
2.6	3.2	3.6	5	5.4	6.3	9.4	10.7	13.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pipeline Ancillaries

Strainers and Filters FI 6.06

Stainless Steel Filter

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16
Temperature	190 °C
Medium	gases and steam

Description

Filters are used to retain contaminants present in fluids.

FI 6.06 is entirely manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. For this reason it is used for the filtration of corrosive gases and liquids.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Two different types of tube filters can be fitted in the filter body.
Type P: High quality pleated 3-ply filter element (fabric/metallic fibre fleece/ fabric)
Type S: Filter element made of sintered stainless steel

Low pressure loss and large dirt retention capacity ensure long life and minimise servicing and maintenance.

The filter may be cleaned by blowing through with compressed air or steam or flushing using a suitable cleaning agent. The best results are obtained by ultrasonic cleaning in an aqueous solution.

Standard

» all stainless steel construction
» quick-release body clamp ring
» retained particle size: type P - 25 µm; type S - 20 µm
» drain plug in body bottom section
» bleed plug in body top section

Options

» retained particle size 5 µm for types P and S
» various seal materials suitable for your medium
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Resistance Coefficient ζ

filter element type	filter mesh µm	nominal diameter	
		G 1/2 - 1 1/4	G 1 1/2 + 2
		DN 15 - 32	DN 40 + 50
P	25	15	13
	5 (Sonder)	17	16
S	20	16	15
	5 (Sonder)	28	25

Permitted Pressure Drop [bar]

filter element type		nominal diameter	
		G 1/2 - 1 1/4	G 1 1/2 + 2
		DN 15 - 32	DN 40 + 50
P	5/25 µm	16	5
S	5 µm	12	11
	20 µm	8	7

Calculating the pressure drop

$\Delta p = \zeta \cdot \omega^2/2 \cdot \rho \cdot 10^{-5}$ [bar]
ζ resistance coefficient (see table)
ω [m/s] flow velocity within the connection cross section (nominal diameter)
ρ [kg/m^3] density of fluid

Pipeline Ancillaries

Strainers and Filters FI 6.06

Stainless Steel Filter

Materials		
Filter Element Type	P	S
max. Temperature	water 100 °C steam and gasses 140 °C	steam and gasses 190 °C
Body	CrNiMo-steel	CrNiMo-steel
Seal	FEPM	FEPM
Filter Element	CrNiMo-steel, EP	CrNiMo-steel
Profile Clamp	CrNiMo-steel	

Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A_1*	160	158	156	204	192	220
B	235	235	235	235	350	350
C	275	275	275	275	420	420
D	140	140	140	140	200	200
E	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4

* tolerance ± 2 mm

Weights [kg]					
nominal diameter G					
1/2	3/4	1	1 1/4	1 1/2	2
3.1	3.2	3.3	3.7	6.8	7

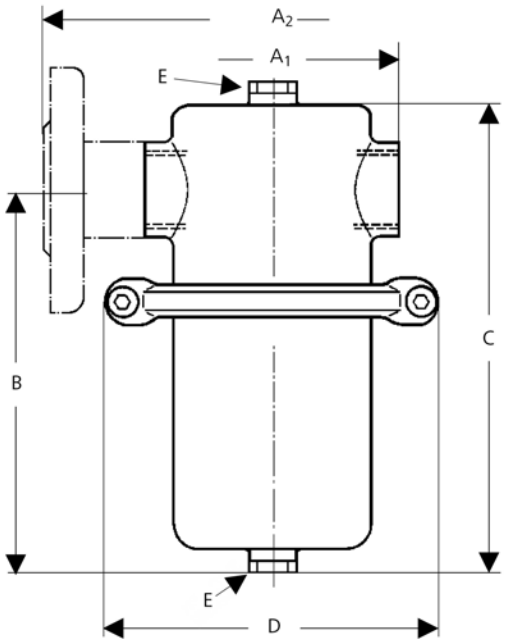
Dimensions [mm]						
size	nominal diameter DN					
	15	20	25	32	40	50
A_2*	160	160	160	180	200	230
B	235	235	235	235	350	350
C	275	275	275	275	420	420
D	140	140	140	140	200	200
E	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4

* tolerance ± 2 mm

Weights [kg]					
nominal diameter DN					
15	20	25	32	40	50
4.2	4.7	5	6	7.4	10.3

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pipeline Ancillaries

Strainers and Filters SF 1.00

Pot Strainers for High Pressures

Technical Data

Connection DN	15 - 150
Connection G	3/8 - 2
Nominal Pressure PN	16 - 160
Temperature	PN 16 up to 110 °C PN 25 - 160 up to 200 °C
Medium	liquids, gases and steam

Description

Strainers protect plant and equipment such as regulators, valves, measuring equipment against damage or operational failure caused by contamination. They are essential for start-up as well as continuous operation.

SF 1.00 is manufactured from cast iron and has a drain plug in its cover. The flat strainer mesh which is positioned perpendicular to the flow, and the straight-through flow result in a minimum pressure drop and a large sludge collecting chamber.

Cleaning is extremely simple and quick. Only the cover has to be removed for dismantelling.

Installation can be carried out in any position; installation with the cover at the bottom is recommended.

Standard

» stainless steel mesh, mesh size 0.5 mm
» from DN 65 cover with drain plug

Options

» special versions for up to 400 °C
» strainer mesh sizes 0.25 mm, 1 mm or 2.5 mm
» pressure gauges upstream and downstream of the strainer
» various seal materials suitable for your medium
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Screen Netting		
screen	light screen aperture mm	open screen area %
no. 3	0.25	41
no. 4	0.50	51
no. 5	1.0	67
no. 7	2.5	69

screen no. 4 = standard screen

Pipeline Ancillaries

Strainers and Filters SF 1.00

Pot Strainers for High Pressures

Materials			
Nominal Pressure	PN 16	PN 25/40	PN 63/160
Temperature	200 °C	200 °C	200 °C
Body	≤ DN25 grey cast iron > DN32 spherodial cast iron	cast steel	cast steel
Seal	Graphite	Graphite	Graphite
Screen	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Screen Frame	up to DN 80 CrNiMo-steel from DN 100 grey cast iron, optional CrNiMo-steel		

Dimensions [mm] Flange Connection

size	nominal pressure PN	nominal diameter DN										
		15	20	25	32	40	50	65	80	100	125	150
A	16	-	150	160	180	200	230	290	310	350	400	400
	40	196	200	-	244	-	-	-	-	-	-	-
	63/160	210	230	-	-	-	-	-	-	-	-	-
B	16	-	110	125	130	135	150	170	160	190	250	275
	40	120	120	-	130	-	-	-	-	-	-	-
	63/160	120	145	-	-	-	-	-	-	-	-	-
C	16	-	160	185	215	220	255	285	275	345	410	490
	40	170	170	-	215	-	-	-	-	-	-	-
	63/160	170	200	-	-	-	-	-	-	-	-	-
ø D	16	-	110	140	140	170	170	210	220	255	320	350
	40	110	110	-	140	-	-	-	-	-	-	-
	63/160	110	150	-	-	-	-	-	-	-	-	-
E	16 - 160	-	-	-	-	-	-	G 1/2		G 1		
F	16 - 160	G 1/4									G 1/2	

Weigths [kg] Flange Connection

nominal pressure PN	nominal diameter DN										
	15	20	25	32	40	50	65	80	100	125	150
16	-	4.5	6	8.5	12.5	16.5	25	30	46	67	90
40	5.5	6.5	-	11	-	-	-	-	-	-	-
63/160	8	16	-	-	-	-	-	-	-	-	-

Dimensions [mm] BSP Female Connection

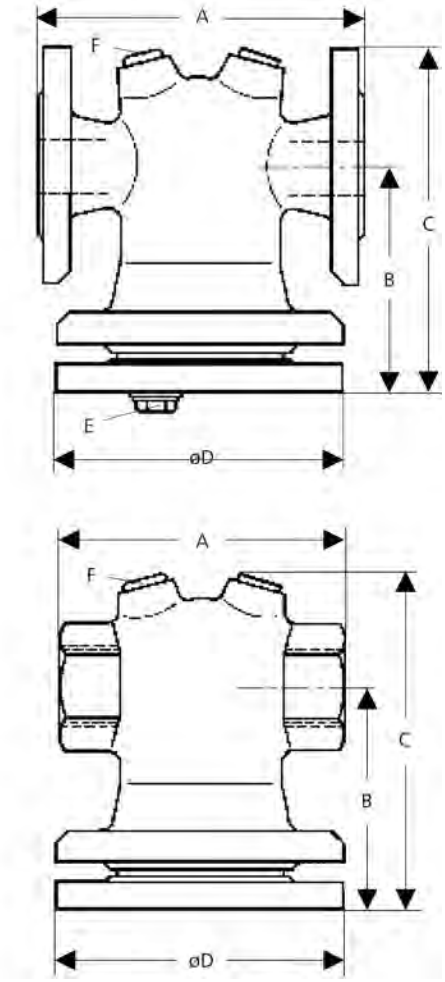
size	nominal pressure	nominal diameter G						
		3/8	1/2	3/4	1	1 1/4	1 1/2	2
A	PN 16	90	90	120	140	140	170	170
	PN 40	120	120	120	-	160	-	-
	PN 63/160	120	120	120	-	-	-	-
B	PN 16	65	65	110	125	130	135	150
	PN 40	120	120	120	-	130	-	-
	PN 63/160	120	120	120	-	-	-	-
C	PN 16	120	120	165	185	215	220	255
	PN 40	170	170	170	-	215	-	-
	PN 63/160	170	170	170	-	-	-	-
ø D	PN 16	65	110	110	140	140	170	170
	PN 40	110	110	110	-	140	-	-
	PN 63/160	110	110	110	-	-	-	-
F	PN 16 - 160	G 1/4						

Weights [kg] BSP Female Connection

nominal pressure	nominal diameter G						
	3/8	1/2	3/4	1	1 1/4	1 1/2	2
PN 16	1.5	1.5	3	4	5	7.5	10.5
PN 40	5	5	5	-	7	-	-
PN 63	6	6	6	-	-	-	-
PN 160	8	8	8	-	-	-	-

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pipeline Ancillaries

Strainers and Filters SF 1.00

Pot Strainers for High Pressures

Flow resistance Δp [bar] for water, screen no. 4, clean

Mesh Size [mm]				
screen no.	3	4	5	7
mesh size	0.25	0.5	1	2.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Calculation of flow resistance

$\Delta p = \zeta \cdot w^2/2 \cdot \rho \cdot 10^{-5}$ [bar]

ζ: Coeffizient of flow resistance (see table below). The values are based on a cleane screen no. 4.

w [m/s]: Flow velocity in cross-section of connection (nominal diameter). Please refer to our flow data charts.

ρ = [kg/m^3]: Density of medium.

Coefficient of flow resistance for clean screen no. 4									
flange connection DN	15	20	25	32	40	50	65	80	100
mesh size cm^2	16	26	30	40	52	68	86	106	160
coefficient ζ	1.2	1.9	2.0	1.6	1.8	1.4	1.5	1.7	2.4

Coefficient of flow resistance for clean screen no. 4							
flange connection DN	125	150	200	250	300	350	400
mesh size cm^2	220	330	650	1050	1500	2100	2500
coefficient ζ	2.7	2.9	3.3	3.5	3.6	3.6	3.5

Coefficient of flow resistance for clean screen no. 4							
screwed connection G	3/8	1/2	3/4	1	1 1/4	1 1/2	2
mesh size cm^2	16	16	26	30	40	52	68
coefficient ζ	1.2	1.2	1.9	2.0	1.6	1.8	1.4

For screens other than no. 4 the resistance value is given in the tables above should be multiplied by a correction factor.

Correction factor for other mesh sizes			
sreen no.	3	5	7
correction factor	1.15	0.9	0.85

Pipeline Ancillaries

Strainers and Filters SF 2.00

Pot Strainers for Large Nominal Diameters

Technical Data

Connection DN	25 - 1000
Nominal Pressure PN	6 - 100
Temperature	200 °C
Medium	liquids, gases and steam

Description

Strainers protect plant and equipment such as regulators, valves, measuring equipment against damage or operational failure caused by contamination. They are essential for start-up as well as continuous operation.

SF 2.00 is a welded steel construction and has a drain plug in its cover and in the bottom of the body. The flat strainer mesh which is positioned perpendicular to the flow, and the straight-through flow result in a minimum pressure drop and a large sludge collecting chamber.

It is recommended that the larger strainer sizes (from DN 200) should be installed with the cover at the top.

The SF 2.00 strainer may be fitted with pressure gauges upstream and downstream of the strainer.

Cleaning is extremely simple and quick. Only the cover has to be removed for dismantelling.

Standard

- body made of welded steel
- stainless steel mesh
- drain plug in cover and body bottom

Options

- strainer mesh sizes 0.25 mm, 0.5 mm, 1 mm or 2.5 mm
- pressure gauges upstream and downstream of the strainer
- various seal materials suitable for your medium
- special connections: ANSI or JIS flanges, welding spigots; other connections on request
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Screen Netting

screen	light screen aperture mm	open screan area %	standard
no. 3	0.25	41	
no. 4	0.5	51	DN 25 - 150
no. 5	1.0	67	DN 200 - 400
no. 7	2.5	69	DN 500 - 1000

Pipeline Ancillaries

Strainers and Filters SF 2.00

Pot Strainers for Large Nominal Diameters

Materials			
Nominal Diameter	DN 25 - 80	DN 100 - 150	DN 200 - 400
Temperature	200 °C	200 °C	200 °C
Body	St 37-2	St 37-2	St 37-2
Seal	Nova Universal	Nova Universal	Nova Universal
Screen	CrNiMo-steel	CrNiMo-steel	CrNiMo-steel
Screen Frame	CrNiMo-steel	grey cast iron opt. CrNiMo-steel	steel zinced opt. CrNiMo-steel

Dimensions [mm]										
size	PN	nominal diameter DN								
		25	32	40	50	65	80	100	125	150
A	up to PN 40	160	180	200	230	290	310	350	400	480
B		140	140	160	190	200	200	230	260	300
B*		250	250	310	350	360	360	430	490	600
C		200	200	240	320	340	340	400	470	560
ø D		185	185	200	235	270	270	300	375	450
E		G 1/4	G 1/4	G 1/4	G 1/4	G 1/2	G 1/2	G 3/4	G 3/4	G 1

*size B with screen pulled out

Dimensions [mm]						
size	PN	nominal diameter DN				
		200	250	300	350	400
A	6 - 16	500	600	700	800	900
A	25	550	650	750	900	950
B	up to PN 25	310	360	420	480	550
*		750	900	1050	1150	1350
C		600	700	820	930	1050
ø D		450	530	580	710	750
E		G 1	G 1 1/4	G 1 1/4	G 1 1/2	G 1 1/2

*size B with screen pulled out

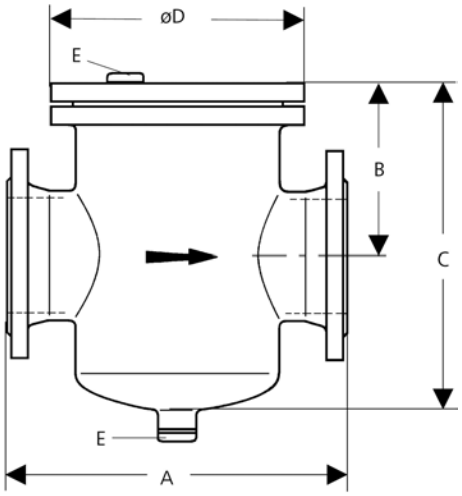
Weights [kg]									
nominal pressure	nominal diameter								
	25	32	40	50	65	80	100	125	150
PN 16	-	-	-	-	25	35	45	55	75
PN 40	12	15	19	28	35	45	70	90	125

Weights [kg]					
nominal pressure	nominal diameter DN				
	200	250	300	350	400
PN 6, 10	85	145	205	310	430
PN 16	120	160	215	340	510
PN 25	170	250	320	460	650

Dimensions and weights for nominal diameter DN 500 - 1000 on request.

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pipeline Ancillaries

Strainers and Filters SF 2.00

Pot Strainers for Large Nominal Diameters

Flow resistance Δp [bar] for water, screen no. 4, clean

Mesh size [mm] [mm]				
screen no.	3	4	5	7
mesh size	0.25	0.5	1	2.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Calculation of flow resistance

$\Delta p = \zeta \cdot w^2/2 \cdot \rho \cdot 10^{-5}$ [bar]

ζ: Coeffizient of flow resistance (see table below). The values are based on a cleane screen no. 4.

w [m/s]: Flow velocity in cross-section of connection (nominal diameter). Please refer to our flow data charts.

ρ = [kg/m^3]: Density of medium.

Coefficient of flow resistance for clean screen no. 4									
nominal diameter DN	15	20	25	32	40	50	65	80	100
mesh size cm^2	16	26	30	40	52	68	86	106	160
coefficient ζ	1.2	1.9	2.0	1.6	1.8	1.4	1.5	1.7	2.4

Coefficient of flow resistance for clean screen no. 4							
nominal diameter DN	125	150	200	250	300	350	400
mesh size cm^2	220	330	650	1050	1500	2100	2500
coefficient ζ	2.7	2.9	3.3	3.5	3.6	3.6	3.5

Nominal diameter DN 500 - 1000 on request.

For screens other than no. 4 the resistance value is given in the tables above should be multiplied by a correction factor.

Correction factor for other mesh sizes			
screen no.	3	5	7
correction factor	1.15	0.9	0.85

Pipeline Ancillaries

Strainers and Filters SF 3.00

Strainer for Very High Pressures

Technical Data

Connection DN	15 - 100
Nominal Pressure PN	160 - 500
Temperature	550 °C
Medium	liquids gases and steam

Description

Strainers protect plant and equipment such as regulators, valves, measuring equipment against damage or operational failure caused by contamination. They are essential for start-up as well as continuous operation.

SF 3.00 is manufactured from forged steel and features a lenticular-section metallic body seal. The standard model has welding spigot connections. The flat stainless steel strainer mesh which is positioned perpendicular to the flow, and the straight-through flow result in a minimum pressure drop and a large sludge collecting chamber.

Cleaning is extremely simple and quick. Only the cover has to be removed for dismantelling.

Installation can be carried out in any position; installation with the cover at the bottom is recommended.

Standard

» welding spigots
» stainless steel mesh, mesh size 0.5 mm

Options

» strainer mesh sizes 0.25 mm, 1 mm or 2.5 mm
» special materials such as Duplex, Superduplex, Hastelloy® or titanium, others on request
» special connections: DIN-, ANSI or JIS flanges, other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Screen Netting

screen	light screen aperture mm	open screen area %
Nr. 3	0.25	41
Nr. 4	0.50	51
Nr. 5	1.0	67
Nr. 7	2.5	69

Pipeline Ancillaries

Strainers and Filters SF 3.00

Strainer for Very High Pressures

Materials				
Nominal Pressure	PN 160 - 500			
Temperature	400 °C	450 °C	520 °C	550 °C
Body	C22.8	15Mo3	13CrMo44	
Seal	St 35.8	15Mo3	13CrMo44	10CrMo910
Screen	CrNiMo-steel			
Screen Frame	CrNiMo-steel			

Dimensions [mm]

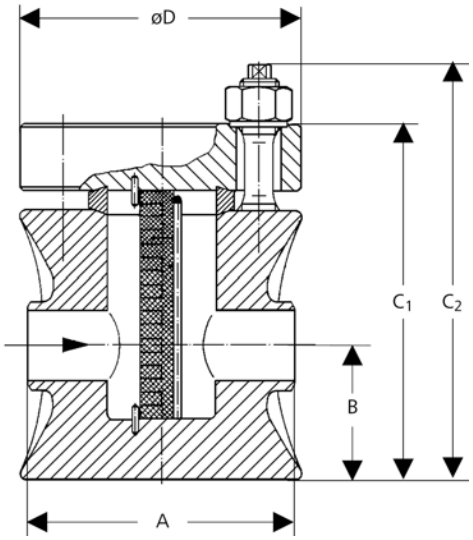
PN	size	nominal diameter DN								
		15	20	25	32	40	50	65	80	100
160	A	125		165	165	180	180	205	250	280
	B	45		65	80	75	100	105	105	130
	C_1	125		175	205	200	250	265	270	335
	C_2	150		205	240	240	285	305	310	375
	ø E	130		170	170	190	190	220	270	300
250	A	125		175	175	190	190	225	250	280
	B	45		70	80	80	100	115	110	135
	C_1	130		195	215	220	260	290	300	355
	C_2	165		230	255	265	300	330	350	400
	ø E	130		180	180	200	200	240	270	305
315	A		140	175		200	200	225	260	285
	B		62,5	70		82,5	100	112,5	110	140
	C_1		170	195		220	265	300	300	365
	C_2		205	235		270	310	350	350	415
	ø E		145	180		210	210	245	280	315
400	A	130	145	185		205	195	230	270	295
	B	45	65	70		82,5	95	115	110	140
	C_1	125	180	195		225	250	310	310	375
	C_2	160	220	230		275	295	355	365	430
	ø E	135	150	190		215	205	250	290	320
500	A			195	185		200			
	B			70	75		100			
	C_1			200	215		270			
	C_2			245	255		310			
	ø E			200	190		210			

Weights [kg]

nominal pressure PN	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
160	9	16	25	31	35	42	65	90	130
250	13	18	30	35	41	50	76	105	160
315	15	22	33	38	48	58	85	110	175
400	16	24	35	42	53	60	105	140	190
500	18	28	37	45	55	63	115	150	250

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pipeline Ancillaries

Strainers and Filters SF 3.00

Strainer for Very High Pressures

Flow resistance Δp [bar] for water, screen no. 4, clean

Mesh Size [mm]				
screen no.	3	4	5	7
mesh size	0.25	0.5	1	2.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Calculation of flow resistance

$\Delta p = \zeta \cdot w^2/2 \cdot \rho \cdot 10^{-5}$ [bar]

ζ: Coeffizient of flow resistance (see table below). The values are based on a cleane screen no. 4.

w [m/s]: Flow velocity in cross-section of connection (nominal diameter). Please refer to our flow data charts.

ρ = [kg/m^3]: Density of medium.

Coefficient of flow resistance ζ for clean screen no. 4									
nominal diameter DN	15	20	25	32	40	50	65	80	100
mesh size cm^2	16	26	30	40	52	68	86	106	160
coefficient	1.2	1.9	2.0	1.6	1.8	1.4	1.5	1.7	2.4

For screens other than no. 4 the resistance value is given in the tables above should be multiplied by a correction factor.

Correction factor for other mesh sizes			
screen no.	3	5	7
correction factor	1.15	0.9	0.85

Pipeline Ancillaries

Strainers and Filters SF 6.00

Stainless Steel Pot Strainer

Technical Data

Connection DN	15 - 100
Connection G	1/2 - 2
Nominal Pressure PN	16
Temperature	130 °C
Medium	liquids, gases and steam

Description

Strainers protect plant and equipment such as regulators, valves, measuring equipment against damage or operational failure caused by contamination. They are essential for start-up as well as continuous operation.

SF 6.00 is entirely manufactured from deep-drawn stainless steel featuring excellent corrosion resistance. The flat stainless steel strainer mesh which is positioned perpendicular to the flow, and the straight-through flow result in a minimum pressure drop and a large sludge collecting chamber.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Cleaning is extremely simple and quick. Only the cover has to be removed for dismantelling.

Installation can be carried out in any position; installation with the cover at the bottom is recommended.

Standard

» all stainless steel construction
» strainer mesh size 0.5 mm
» quick-release body clamp ring

Options

» strainer mesh sizes 0.25 mm, 1 mm or 2.5 mm
» various seal materials suitable for your medium
» special connections:
Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Screen Netting		
screen	light screen aperture mm	open screan area %
Nr. 3	0.5	41
Nr. 4	0.50	51
Nr. 5	1.0	67
Nr. 7	2.5	69

Screen Plane cm^2		
nominal diameter		
DN 15 - 50	DN 65 - 80	DN 100
G 1/2 - 2	-	-
60	114	152

Pipeline Ancillaries

Strainers and Filters SF 6.00

Stainless Steel Pot Strainer

Materials	
Body	CrNiMo-steel
Seal	EPDM
Screen	CrNiMo-steel
Screen Frame	CrNiMo-steel
Profile Clamp	CrNiMo-steel

Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A_1*	110	110	110	110	110	160
B	105	105	105	105	105	105
C	155	155	155	155	155	155
D	140	140	140	140	140	140

* tolerance ± 2 mm

Weights [kg]					
nominal diameter G					
1/2	3/4	1	1 1/4	1 1/2	2
1.2	1.4	1.4	1.6	1.6	2.3

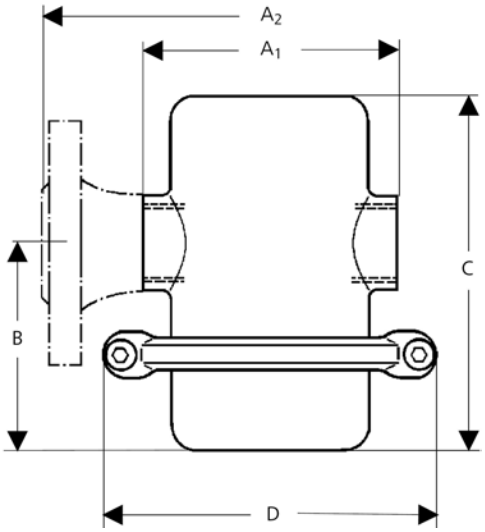
Dimensions [mm]									
size	nominal diameter DN								
	15	20	25	32	40	50	65	80	100
A_2*	150	150	160	180	200	230	290	310	350
B	108	108	108	108	108	108	148	148	207
C	157	157	157	157	157	157	212	212	270
D	140	140	140	140	140	140	200	200	200

* tolerance ± 2 mm

Weights [kg]								
nominal diameter DN								
15	20	25	32	40	50	65	80	100
2.6	3.2	3.6	5	5.1	6.3	9.4	10.7	13.5

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Pipeline Ancillaries

Separators

Combined Valve with Integrated Liquid Separator			AS 2
spin separator of straight design | usable for liquids, gases, steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design			
DN	25 + 40	G	1 + 1 1/2
PN	16	p	0 - 13 bar
Q	1900 Nm^3/h	Collection Efficiency	1200 l/h
T	190 °C		

Gas Separator with integrated Bleeding and Venting Valve			AS 5
of straight design, with specially shaped packed bed for effective gas separation | suitable for nearly all liquids | completely made of deep-drawn CrNiMo steel (316L) – body surface finish Ra			
DN	50	PN	16
p	0 - 16 bar	T	190 °C

Pipeline Ancillaries

Separators AS 2

Combined Valve with Integrated Liquid Separator

Technical Data

Connection DN	25 + 40
Connection G	1 + 1 1/2
Nominal Pressure PN	16
Operating Pressure	0 - 13 bar
Flow Rate	1900 Nm^3/h
Collection Efficiency	1200 l/h
Temperature	190 °C
Medium	gases and steam

Description

Centrifugal separators use the cyclone principle to separate automatically liquids, solids and steam from gas flows while the gas is under operating pressure. The liquid trap built into the separator body operates instantaneously and its operation is not impaired by backpressure or pressure fluctuations. The collected liquid is safely drained by the float control. No additional energy input is required.

Separators type AS2 are of inline design and have their drain outlets at the bottom. Being entirely constructed of corrosion-resistant stainless steel, they can be used universally, i.e. especially for corrosive media.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Standard

» all stainless steel construction (CrNiMo steel)
» quick-release body clamp ring
» built-in liquid trap

Options

» various seal materials to suit your medium
» expansion pipe connection in body top section for separating liquids from compressed air or gases
» other connections on request
» special designs on request

Product features in brief

» inline design with drain outlet at the bottom
» built in steam trap
» compact and lightweight thanks to deep-drawn components
» corrosion-resistant CrNiMo steel
» various connection options

Please state working pressure range when enquiring or ordering.

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Collection Efficiency [l/h] and Pressure Ranges [bar]

Δp bar	G 1, DN 25 pressure range bar			G 1 1/2, DN 40 pressure range bar
	0 - 2	0 - 6	0 - 12	0 - 13
0,1	70	19	6	220
0,2	100	28	9	320
0,5	160	40	12	710
1	230	70	18	980
2	350	110	27	1200
4	-	160	46	1200
6	-	200	50	1200
8	-	-	60	1200
10	-	-	70	1180
12	-	-	75	1030
13	-	-	-	950

Pipeline Ancillaries

Separators AS 2

Combined Valve with Integrated Liquid Separator

Materials		
Nominal Diameter	G 1, DN 25	G 1 1/2, DN 40
Body	CrNiMo-steel	CrNiMo-steel
Body Seal	EPDM optional FEPM	EPDM optional FEPM
Seat, Cone	CrNiMo-steel	CrNiMo-steel
Float	CrNiMo-steel	CrNiMo-steel
Valve Seal	FFKM	CrNiMo-steel

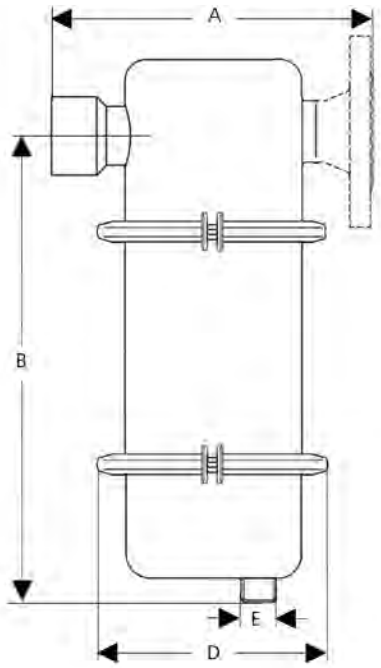
Dimensions [mm]				
size	nominal diameter			
	G 1	G 1 1/2	DN 25	DN 40
A	155	195	195	240
AE	-	238	-	260
B	225	330	225	330
D	140	200	140	200
E	G 1/2A	G 3/4A	G 1/2A	G 3/4A

Weights [kg]			
nominal diameter			
G 1	G 1 1/2	DN 25	DN 40
2,6	3,5	4,5	6

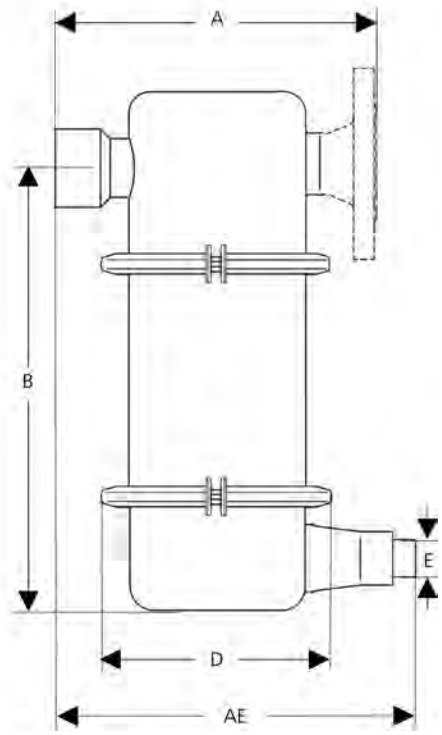
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

G 1, DN 25



G 1 1/2, DN 40



Pipeline Ancillaries

Separators AS 5

Gas Separator with integrated Bleeding and Venting Valve

Technical Data

Connection DN	50
Nominal Pressure PN	16
Operating Pressure	0 - 16 bar
Temperature	190 °C
Medium	liquids

Description

By means of a special packed bed, the Mankenberg gas separators ensure that the gases bound with the fluid are separated and automatically discharged. This works without additional auxiliary energy and without pressure loss.

AS 5 gas separators are of straight design. The body and the packing bed are made of stainless steel with excellent corrosion resistance. The valve cone of the integrated bleeding and venting valve is soft sealed.

The special shape of the packing bed components combines high throughput and low fluid resistance with utmost separating effectiveness.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

The fluid flushes the special fillers and, during this process, the gases remain stuck to the fillers in the form of micro bubbles. These bubbles then accumulate and rise. The integrated bleeding valve automatically discharges the gases without any pressure loss.

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» ozone-resistant design
» various seal materials suitable for your medium
» special connections: ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Flow Rate [Nm³/h] Outlet 1/2A

Δp bar	pressure range bar *		
	0 - 2	0 - 6	0 - 16
0.1	3.1	1	0.3
0.2	4.4	1.4	0.4
0.5	6.8	2.2	0.6
1	8.6	2.8	0.7
2	12	4.2	1
4		7	1.7
6		9.8	2.4
8			3.1
10			3.8
12			4.5
16			5.9

Flow Rate [Nm³/h] Outlet 3/4A

Δp bar	pressure range bar *			
	0 - 2	0 - 6	0 - 10	0 - 16
0.1	14	6.4	4.1	3.1
0.2	20	9	5.7	4.4
0.5	31	13	8.9	6.8
1	39	17	11	8.6
2	59	26	16	12
4		44	28	21
6		61	39	30
8			50	38
10			62	47
12				53
16				73

The quoted flow volumes apply to a fully open valve i.e. in start-up condition at 0 °C and 1013 mbar. With continuous bleeding e.g. of filter vessels, the maximum flow volume is 30 % less on average.

* Please note:
Smaller seat diameter for higher pressure range. If the selected working pressure range is too high, the flow volume may be inadequate.

Pipeline Ancillaries

Separators AS 5

Gas Separator with integrated Bleeding and Venting Valve

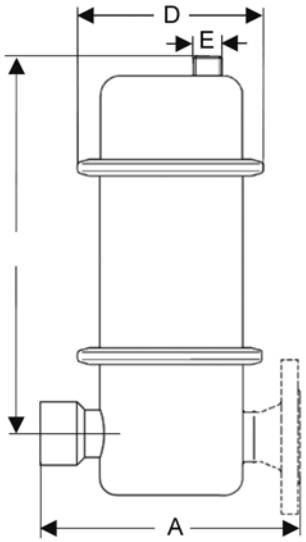
Materials	
Body	CrNiMo-steel
Body Seal	EPDM
Internals	CrNiMo-steel
Filling Basket	CrNiMo-steel
Packing Bed	CrNi-steel
Float	CrNiMo-steel
Valve Seal	EPDM
Profile Clamp	CrNiMo-steel

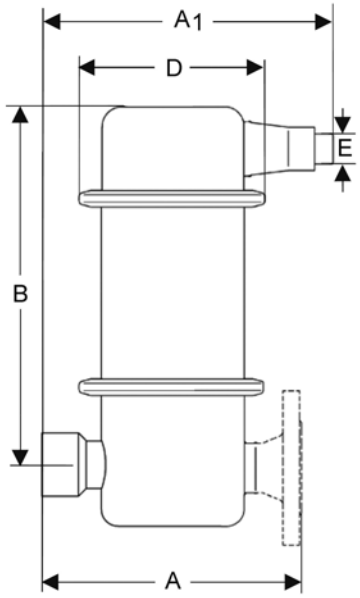
Dimensions [mm]		
size	nominal diameter outlet (size E)	
	G 1/2	G 3/4
A	220	220
A_1	36	140
B	262	243
D	150 / 200	150 / 200

Weights [kg]	
outlet G 1/2	outlet G 3/4
10.5	11.0

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

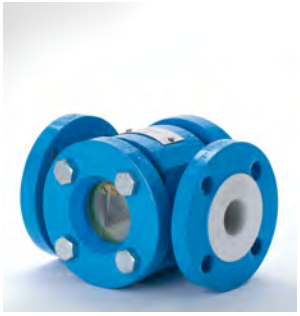




Pipeline Ancillaries

Sight Glasses / Flow Indicators

Two Glass Sight Glasses / Flow Indicator			DA 4.00 - 4.40
with Flag, Vane, Ball or without Indicator Device | suitable for liquids, gases, steam | body made of steel, C-steel, CrNiMo steel | available in various variants, also in special materials (e.g. Hastelloy®) | individually customised to your requirements			
DN	DA 4.00 - 4.20 DN 15 - 250 DA 4.30 - 4.40 DN 15 - 50	G	DA 4.00 - DA 4.40 G 3/8 - 2
PN	16 - 40	T	280 °C



Single Glass Sight Glasses / Flow Indicators			DA 6.00 - 6.30
DA 6.00 without internal parts, DA 6.10 with flag, DA 6.12 with external display for opaque liquids, DA 6.30 with vane | usable for liquids, gases, steam | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | long operational lifespan, manageable installation – well-priced stainless steel sight glasses			
DN	15 - 50	G	1/2 - 2
PN	16	T	130 °C

Two Glass Sight Glasses / Flow Indicator			DA 7.00 - 7.10
DA 7.00 without internal parts, DA 7.10 with flag | usable for liquids, gases, steam | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | easy-to-maintain owing to the clamp system | long operational lifespan, manageable installation – well-priced stainless steel sight glasses			
DN	15 - 50	G	1/2 - 2
PN	16	T	130 °C

Know How Flow indicators

Sight glasses, flow indicators and flow meters indicate media and flow conditions in pipeline systems and plant

Selection
Sight glasses are monitoring equipment without indicating mechanisms. Flow indicators have internal components that are set in motion by the flow.
Flow meters are fitted with a calibrated measuring scale and indicating flag.

Glasses
Sight glasses and flow indicators are supplied with one or two glasses. Two glasses enable the user to see through the medium. If the installation site is dark or if it is difficult to see the glass, a light may be fixed at the back which allows a better view of the flowing medium.

Glass qualities
Soda lime glass is used for temperatures up to 150 °C (see DIN 8902); in the case of alkaline media (boiler water) only up to 100 °C.
Maxos glass is used for temperatures up to 280 °C (see DIN 7080).

Flow direction
Our standard flow indicators are supplied for left-to-right flow; we also supply indicators for right-to-left flow at the customer's request. Please state the required flow direction when ordering.

Operating limit
Flow indicators and flow meters have an operating limit. Below this limit the flow is insufficient to set the internal components in motion (see Data Sheet).

Indicator flag for one direction
Flow indicators with flag and reset spring for one flow direction are the most popular type and can be installed in any position. Soda lime glasses feature a graduated scale of lines from 1 to 10. This scale allows the flow volume to be gauged easily and quickly. In many simple applications this type of indicator may be used as an alternative to an expensive flow meter. For the smaller DN (up to G 1 / 25 mm) the indicating flag is supplied without a spring to allow it to indicate even small volumes. Vertical installation with flow from top to bottom, however, requires a spring.

Indicator flag for both directions
The centrally mounted flag is deflected towards the flow direction, thus indicating the direction of the flow. The position of the flag changes as the flow increases or decreases.

External indicator
For turbid or opaque liquids without magnetic contamination you should select a flow indicator with external pointer (Type 6.12). What has been said above under item "Indicator flag for one direction" applies to this type of indicator as well.

Ball-type indicator
The flow moves a ball from its rest position (at the bottom of the housing) to the top. This type of flow indicator must be installed vertically for flow from bottom to top.

Indicator with impeller
The flow causes the impeller to rotate. The speed of the impeller allows the flow volume to be gauged. Suitable for all installation positions as well as all pipeline flow speeds below 1 m/sec.

Wiper
Some media tend to deposit dirt on the internal surface of the glass. For such cases we supply a type fitted with an elastomer wiper. The wiper can be supplied only for single-glass flow indicators.

Flow meters
An internal weighted flag indicates the flow volume in m3/h water at 20 °C on a calibrated scale. Flow meters can be supplied in two measuring ranges for each nominal diameter.

Resistance to media
The standard cover seal is not resistant to all media.

Installation
Please note the flow direction if you want to install a flow indicator with fixed direction of flow.

Operation
Flow indicators and sight glasses are quite simple units which do not require any special maintenance during operation. Dirty glasses should be cleaned and the cover seals renewed at the same time.

Maintenance
Remove the glass for cleaning. For reassembling the screws should be tightened evenly and diagonally using the specified torque, or the clamp ring seal tightened gently to avoid damaging the glass. We recommend that you keep a supply of replacement glasses.

Valves free of oil and grease or silicone
Please pay attention to order an fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, Operating Instruction etc. MUST be followed.

Selection Flow Indicators and Sight Glasses

sight glasses

glasses		T	PN	connection			SS	notes	type
1	2	°C		G	DN	*			
•		130	16	1/2 - 2	15 - 50	*	•	economical stainless steel design	6.00
	•	280	16 - 40	3/8 - 1	15 - 250			simple sight glass	4.00
	•	130	16	1/2 - 2	15 - 50	*	•	peconomical stainless steel design	7.00

flow indicators with flag

glasses		T	PN	connection			SS	notes	type
1	2	°C		G	DN	*			
•		130	16	1/2 - 2	15 - 50	*	•	economical stainless steel design with scale	6.10
•		80	16	1/2 - 2	15 - 50	*	•	for opaque and turbid liquids, with external indicator and scale	6.12
	•	280	16 - 40	3/8 - 1	15 - 250			made of cast iron or steel, one glass with scale	4.10
	•	130	16 - 40	1/2 - 2	15 - 50	*	•	economical stainless steel design, one glass with scale	7.10
	•	280	16	3/8 - 1	15 - 250			for alternating flow directions	4.20

flow indicators with impeller

glasses		T	PN	connection			SS	notes	type
1	2	°C		G	DN	*			
•		80	16	1/2 - 2	15 - 50	*	•	economical stainless steel design, flow velocity < 1 m/s	6.30
	•	80	16 - 40	3/8 - 1	15 - 50			flow velocity < 1 m/s	4.30

flow indicator with ball

glasses		T	PN	connection			SS	notes	type
1	2	°C		G	DN	*			
	•	100	16 - 40	3/8 - 1	15 - 50			flow direction only upwards	4.40

* other connections available, • stainless steel deep drawn

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pipeline Ancillaries

Sight Glasses / Flow Indicators DA 4.00 - 4.40

Two Glass Sight Glasses / Flow Indicator

Technical Data

Connection DN	DA 4.00 - 4.20 DN 15 - 250 DA 4.30 - 4.40 DN 15 - 50
Connection G	DA 4.00 - DA 4.40 G 3/8 - 2
Nominal Pressure PN	16 - 40
Temperature	280 °C
Medium	liquids, gases and steam

Description

Sight glasses without flow indicator may be used for easy checking of fill levels, consistency, bi- or multiphase flows or condensate. They may also be used for mixtures of liquids, gases and vapours. Flow indicators fitted with a vane can be used for monitoring the flow of liquids, gases and biphase fluids. Flow indicators fitted with an impeller are used for liquids and small flow volumes. Flow indicators fitted with a ball can be used for liquids and gases.

DA 4.00 - 4.40 with two borosilicate glasses, a good view of the fluid is provided by the two opposite glasses.

DA 4.00 without indicator device, for basically visual control.
Installation position:
» any position

DA 4.10 with internal indicator flag, for constant flow direction.
Nominal diameters G 3/8 - G 1 and DN 15 - 25 are without resetting spring as standard, subsequent installation is possible. All others are with resetting spring.
Installation position:
» with resetting spring any position
» without resetting spring horizontal with flag downwards, vertical only with flow from below upwards

DA 4.20 with internal indicator flag, for alternating flow directions:
Nominal diameters G 3/8 - G 1 and DN 15 - 25 are without resetting spring as standard, subsequent installation is possible. All others are with resetting spring.
Installation position:
» with resetting spring any position
» without resetting spring horizontal with flag downwards

DA 4.30 with impeller, for constant flow direction:
Installation position:
» horizontal or vertical, for small flow rates (v < 1 m/s)

DA 4.40 with ball, for constant flow direction:
Installation position:
» vertical, only with flow from below upwards

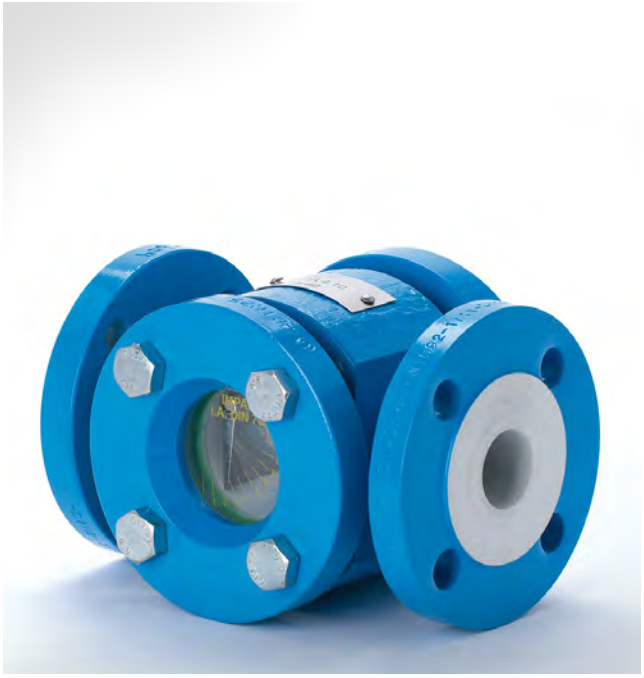
Standard

» 2 borosilicate glasses
» internals made of CrNiMo-steel, impeller PBTP, ball PA

Options

» various seal materials suitable for your medium
» PTFE impeller or ball
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.



Sensitivy [m³/h]

DN	DA 4.10	DA 4.20	DA 4.30	DA 4.40
15	0,18	0,20	0,12	0,15
20	0,18	0,20	0,15	0,20
25	0,18	0,20	0,20	0,35
32	1,20	0,80	0,25	0,50
40	1,20	0,80	0,30	0,60
50	1,50	0,90	1,20	1,00
65	1,50	1,20	-	-
80	2,50	1,60	-	-
100	5,00	2,00	-	-
125	8,00	2,50	-	-
150	8,00	2,50	-	-
200	on request		-	-
250	on request		-	-

sensitivy for water, 20 °C, horizontal istallation (DA 4.40 vertical), app. rate in m³/h

Pipeline Ancillaries

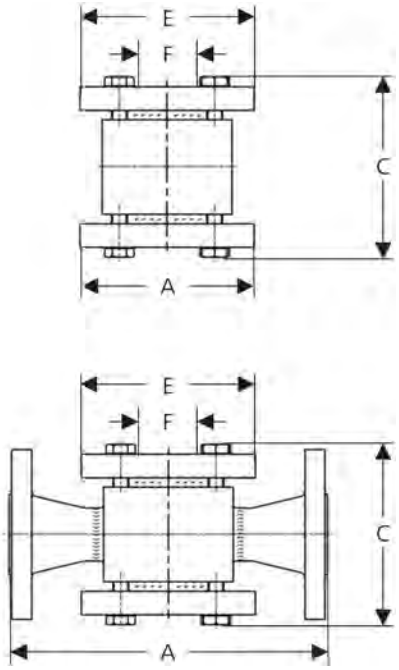
Sight Glasses / Flow Indicators DA 4.00 - 4.40

Two Glass Sight Glasses / Flow Indicator

Materials DA 4.00 - 4.20		
Temperature		150 / 280 °C
Body	PN 16	steel
	PN 25 - 40	C-steel
	PN 16 - 40	CrNiMo-steel
Seal		Nova Universal / Grafit
Glasses		borosilicate glass
Internals		CrNiMo-steel / Ms
Screws		5.6 zinced

Materials					
Type		3.30	4.30	3.40	4.40
Temperature		80 °C		100 °C	
Body	PN 16	steel			
	PN 25 - 40	C-steel			
	PN 16 - 40	CrNiMo-steel			
Seal		Nova Universal			
Glasses		borosilicate glass			
Internals		CrNiMo-steel / PBTP		CrNiMo-steel / Ms / PA	
Screws		5.6 zinced			

Dimensional Drawing



Dimensions Sleeve Connection [mm]

size	nominal diameter G						
	3/8	1/2	3/4	1	1 1/4	1 1/2	2
A	90	90	90	90	90	90	110
B	70	70	70	70	70	70	90
C	140	140	140	140	140	140	180
E	115	115	115	115	115	115	150
F	50	50	50	50	50	50	66

Dimensions Flange Connection [mm]

size	nominal pressure PN	nominal diameter DN												
		15	20	25	32	40	50	65	80	100	125	150	200*	250*
A	PN 16 (steel)	-	-	-	-	-	-	-	260	300	350	400	600	650
	PN 16 (CrNiMo-steel)	164	168	168	172	178	202	290	on request					
	PN 25/40	166	170	170	174	180	206	290						
B	PN 16 - 40	70	70	70	70	70	90	90	110	125	135	135	230	250
C		140	140	140	140	140	180	180	220	250	270	270	460	500
E	PN 16 (steel)	-	-	-	-	-	-	-	130	190	210	210	285	285
	PN 16 (CrNiMo-steel)	115	115	115	115	115	150	150	on request					
	PN 25/40	115	115	115	115	115	150	150						
F	PN 16 - 40	50	50	50	50	50	66	66	80	100	110	110	175	175

Weights [kg]

nominal pressure	nominal diameter G							nominal diameter DN												
	3/8	1/2	3/4	1	1 1/4	1 1/2	2	15	20	25	32	40	50	65	80	100	125	150	200	250
PN 16	2,6	2,6	2,8	3	3	4	7	4	4	5	6	7	10	13	17	26	36	43	80	126
PN 25/40	4,5	4,5	4,5	5	5	5	10	6	7	8	9	9	15	15	on request					

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Pipeline Ancillaries

Sight Glasses / Flow Indicators DA 6.00 - 6.30

Single Glass Sight Glasses / Flow Indicators

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16
Temperature	130 °C
Medium	liquids, gases and steam

Description

Sight glasses without flow indicator may be used for easy checking of fill levels, consistency, bi- or multiphase flows or condensate. They may also be used for mixtures of liquids, gases and vapours. Flow indicators fitted with a vane can be used for monitoring the flow of liquids, gases and biphase fluids. Flow indicators fitted with an impeller are used for liquids and small flow volumes. Flow indicators fitted with a ball can be used for liquids and gases.

DA 6.00 sight glass without internal components:
Installation:
» in any position

DA 6.10 flow indicator with internal vane for uniform flow direction:
With graduated scale 1 – 10 for horizontal or vertical installation.
Sizes ½ - 1 or DN 15 - 25 are supplied without return spring; they can be supplied with return spring as an option; return springs can be fitted retrospectively. All other sizes are fitted with return springs as standard equipment.
Installation:
» with spring: in any position
» without spring: horizontal only if vane points downward; vertical only if flow is upward.

DA 6.12 with external indicator for uniform flow direction, for turbid or opaque fluids:
With graduated scale 1 – 10 for horizontal or vertical installation.
Sizes G ½ - G 1 or DN 15 - 25 are supplied without return spring; they can be supplied with return spring as an option; return springs can be fitted retrospectively. All other sizes are fitted with return springs as standard equipment.
Installation:
» with spring: in any position
» without spring: horizontal only if pointer points downward; vertical only if flow is upward.

DA 6.30 with impeller wheel uniform flow direction, for small flow volumes (v < 1 m/s):
Installation:
» in any position

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» various seal materials suitable for your medium
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Sensitivy [m³/h]

type	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
6.10	0.2	0.25	0.3	1.8	1.8	2.3
6.12	0.4	0.6	0.8	2	2	2.3
6.30	0.15	0.4	0.5	0.5	0.6	1

Sensitivy [m³/h]

type	nominal diameter DN					
	15	20	25	32	40	50
6.10	0.2	0.25	0.3	1.8	1.8	2.3
6.12	0.4	0.6	0.8	2	2	2.3
6.30	0.15	0.4	0.5	0.5	0.6	1

Sensitivy for water 20 °C, horizontal installation

Pipeline Ancillaries

Sight Glasses / Flow Indicators DA 6.00 - 6.30

Single Glass Sight Glasses / Flow Indicators

Materials		
Type	DA 6.00	DA 6.10
Temperature	130 °C	130 °C
Body	CrNiMo-steel	
Seal	EPDM optional Nova Universal	
Glass	borosilicate glass	
Internals	without	CrNiMo-steel
Cover Fastening	profile clamp made of CrNiMo-steel G 2 andDN 50 with screws	

Materials		
Type	DA 6.12	DA 6.30
Temperature	80 °C	80°C
Body	CrNiMo-steel	
Seal	EPDM	EPDM optional Nova Universal
Glass	without	borosilicate glass
Internals	CrNiMo-steel	CrNiMo-steel, PBTP
Cover Fastening	profile clamp and CrNiMo-steel G 2 and DN 50 with screws	

Dimensions [mm]							
size		nominal diameter G					
		1/2	3/4	1	1 1/4	1 1/2	2
A	(tolerance ± 2)	100	105	140	192	190	225
B		25	25	25	25	25	50
C		75	75	75	75	75	150
D		140	140	140	140	140	135
øE	DA 6.00/6.10/6.30	65	65	65	65	65	90
	DA 6.12	80	80	80	80	80	90

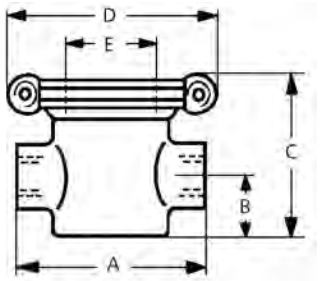
Dimensions [mm]							
size		nominal diameter					
		15	20	25	32	40	50
A	(tolerance ± 2)	170	180	215	220	226	230
B		25	25	25	25	50	50
C		75	75	75	75	150	150
D		140	140	140	140	135	135
øE	DA 6.00/6.10/6.30	65	65	65	65	90	90
	DA 6.12	80	80	80	80	90	90

Weights [kg]											
nominal diameter G						nominal diameter DN					
1/2	3/4	1	1 1/4	1 1/2	2	15	20	25	32	40	50
0.85			1.1		1.8	2.3	3	3.3	4.5	4.9	5.8

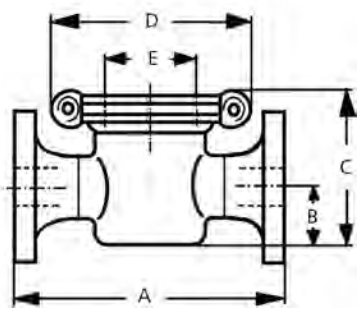
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

sleeve



flange



Pipeline Ancillaries

Sight Glasses / Flow Indicators DA 7.00 - 7.10

Two Glass Sight Glasses / Flow Indicator

Technical Data

Connection DN	15 - 50
Connection G	1/2 - 2
Nominal Pressure PN	16
Temperature	130 °C
Medium	liquids, gases and steam

Description

Sight glasses without flow indicator may be used for easy checking of fill levels, consistency, bi- or multiphase flows or condensate. They may also be used for mixtures of liquids, gases and vapours.

Flow indicators fitted with a vane can be used for monitoring the flow of liquids, gases and biphase fluids.

DA 7.00 and DA 7.10 are sight glasses with two glasses. A good view of the fluid is provided by the two opposite glasses. They are manufactured from stainless steel featuring excellent corrosion resistance.

Body and cover are connected by a clamp ring and 2 bolts. Servicing/maintenance is easy and does not call for special tooling.

DA 7.00 sight glass without internal components:
Installation:
» in any position

DA 7.10 Flow indicator with internal vane for uniform flow direction: With graduated scale 1 – 10 for horizontal or vertical installation. Sizes G ½ - G 1 or DN 15 - 25 are supplied without return spring; they can be supplied with return spring as an option; return springs can be fitted retrospectively. All other sizes are fitted with return springs as standard equipment.
Installation:
» with spring: in any position
» without spring: horizontal only if vane points downward; vertical only if flow is upward.

Standard

» all stainless steel construction
» quick-release body clamp ring

Options

» various seal materials suitable for your medium
» special connections: Aseptic, ANSI or DIN flanges, welding spigots; other connections on request
» special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Sensitivy DA 7.10 with water 20 °C, horizontal installation [m^3/h]					
nominal diameter G					
1/2	3/4	1	1 1/4	1 1/2	2
0.2	0.25	0.3	1.8	1.8	2.3

Sensitivy DA 7.10 with water 20 °C, horizontal installation [m^3/h]					
Nennweite DN					
15	20	25	32	40	50
0,2	0,25	0,3	1,8	1,8	2,3

Pipeline Ancillaries

Sight Glasses / Flow Indicators DA 7.00 - 7.10

Two Glass Sight Glasses / Flow Indicator

Materials DA 7.00	
Temperature	130 °C
Body	CrNiMo-steel
Seals	EPDM, Nova Universal
Glasses	borosilicate glass
Cover Fastening	profile clamp made of CrNiMo-steel G 2 and DN 50 with screws

Materials DA 7.10	
Temperature	130 °C
Body	CrNiMo-steel
Seals	EPDM, Nova Universal
Internals	CrNiMo-steel
Glasses	borosilicate glasses
Cover Fastening	profile clamp made of CrNiMo-steel G 2 and DN 50 with screws

Dimensions [mm]						
size	nominal diameter G					
	1/2	3/4	1	1 1/4	1 1/2	2
A*	100	105	140	182	190	225
B	100	100	100	110	110	200
øD	140	140	140	140	140	135
øE	65	65	65	65	65	90

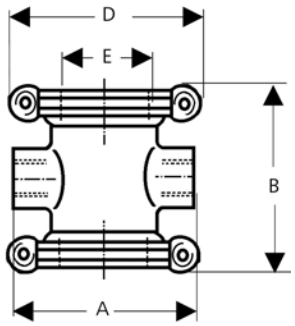
Dimensions [mm]						
size	nominal diameter DN					
	15	20	25	32	40	50
A*	170	180	215	220	226	230
B	100	100	100	110	110	200
øD	140	140	140	140	140	135
øE	65	65	65	65	65	90

Weights [kg]											
nominal diameter G						nominal diameter DN					
1/2	3/4	1	1 1/4	1 1/2	2	15	20	25	32	40	50
1.4			1.6		2.5	2.7	3.3	3.7	5	5.3	6.8

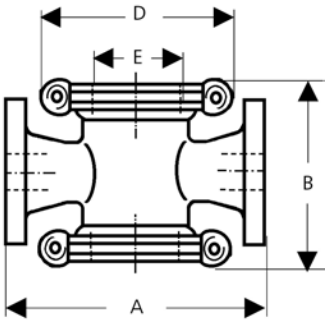
Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing

sleeve



flange



Spares and Accessories

Accessories

Diaphragm Expansion Tank			AKM 200
completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | diaphragm optionally made of EPDM or FPM | easy-to-maintain owing to the clamp system			
G	1/2	PN	10
p	0 - 10 bar	T	130 °C

Float made of CrNiMo-steel (316L)	SC 3, 4, 7, 8
float designed in various forms, sizes and wall thicknesses | attached to the lever by means of a fork or rod passing through it | SC 3 and SC 4 for pressure vessels, SC 7 and SC 8 for pressureless vessels	

Spares and Accessories

Accessories AKM 200

Diaphragm Expansion Tank

Technical Data

Connection G	1/2
Nominal Pressure PN	10
Operating Pressure	0 - 10 bar
Temperature	130 °C
Medium	liquids

Description

The expansion tank AKM 200 is used to relieve pressure in small fluid systems. The valve prevents inadmissible pressure rises for example as a consequence of thermic expansion.

The AKM 200 is a well-priced alternative to other pressure relief equipments such as overflow valves. Pressure relief is done by compressing the gas cushion which is separated from the fluid by a diaphragm.

Once filled with gas, the standard valve functions autonomously without any auxiliary energy. For flammable liquids, inert gases such as for example nitrogen are recommended.

Another advantage of this construction is that no fluid is lost by flowing off and the regulating action is very smooth.

Top and bottom sections of the valve body are connected by a clamp ring and two bolts. Servicing/maintenance is easy and does not call for special tooling.

Attention:
The AKM 200 does not substitute a safety valve for system protection !

Standard

- body from stainless steel SST 316
- body seal and diaphragms of FPM
- body quick-closing device
- manometer connection

Options

- cogset instead of quick closing device
- various diaphragm and seal materials suitable for your medium
- manual air valve on the medium side for venting
- connection for adjustable inert gas supply
- special versions on request

Operating instructions, know how and safety instructions must be observed. All the pressure has always been indicated as overpressure. We reserve the right to alter technical specifications without notice.

Spares and Accessories

Accessories AKM 200

Diaphragm Expansion Tank

Materials	
Body	stainless steel SST 316
Body Seal	FPM
Diaphragm	FPM
Fill-up Valve	nickel-plated brass

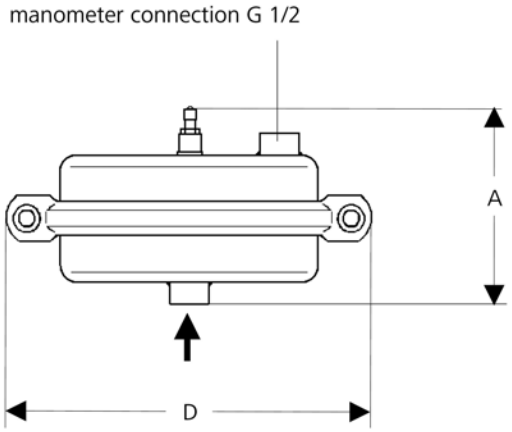
Dimensions [mm]		
size	nominal diameter	
	G 1/2	
A	130	
D	264 / 210	

size A tolerance ± 4 mm

Weights[kg]
nominal diameter
G 1/2
4

Special designs on request.
The pressure has always been indicated as overpressure.
Mankenberg reserves the right to alter or improve the designs or specifications of the products described herein without notice.

Dimensional Drawing



Spares and Accessories

Accessories SC 3, 4, 7, 8

Float made of CrNiMo-steel (316L)

Dimensions [mm] and Weights [kg] SC 3 und SC 4									
diameter mm	60	70	80	90	100	110	120	130	150
thickness mm	0.5	0.8	0.8	0.8	0.8	0.8	0.8	1	1
pressure (≤ 120 °C) bar	34	52	42	32	30	26	24	31	24
socket G	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
internal tube ø mm	-	-	-	-	-	12	12	12	12
filling screw G	-	-	-	-	-	1/4	1/4	1/4	1/4
weight kg	0.06	0.10	0.13	0.16	0.22	0.28	0.31	0.46	0.63

Buoyancy [kg] SC 3 and SC 4 in cold water								
ø60	ø70	ø80	ø90	ø100	ø110	ø120	ø130	ø150
0.06	0.08	0.14	0.22	0.30	0.42	0.595	0.69	1.14

Displacement[dm^3] SC 3 and SC 4								
ø60	ø70	ø80	ø90	ø100	ø110	ø120	ø130	ø150
0.113	0.180	0.268	0.382	0.523	0.697	0.905	1.15	1.77

Dimensions [mm] and Weights [kg] SC 3 and SC 4									
diameter mm	160	180	200	220	250	280	320	380	460
thickness mm	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
pressure (≤ 120 °C) bar	21	33	30	26	24	21	16	13	7
socket G	1/4	1/4	1/4	3/8	3/8	3/8	3/4	3/4	3/4
internal tube ø mm	16	16	16	16	16	16	20	20	20
Füllschraube G	3/8	3/8	3/8	3/8	3/8	3/8	3/4	3/4	3/4
weight kg	0.67	1.26	1.53	1.88	2.37	2.94	3.87	5.35	8.14

Buoyancy [kg] SC 3 and SC 4 in cold water								
ø160	ø180	ø200	ø220	ø250	ø280	ø320	ø380	ø460
1.47	1.79	2.66	3.70	5.81	8.55	13.29	23.38	42.81

Displacement [dm^3] SC 3 and SC 4								
ø160	ø180	ø200	ø220	ø250	ø280	ø320	ø380	ø460
2.14	3.05	4.19	5.58	8.18	11.19	17.16	28.73	50.95

Dimensions [mm] SC 7 and SC 8					
dimensions mm	200	240	280	305	340
height mm	200	240	280	305	340
internal tube ø mm	16	16	16	20	20
filling screw G	3/8	3/8	3/8	3/8	3/4
weight kg	1.3	2.3	3.2	3.8	4.6

Buoyancy [kg] SC 7 and SC 8					
diameter/height mm	200/200	240/240	280/280	305/305	340/340
buoyancy kg	4.2	7.2	11.8	15.6	21.7

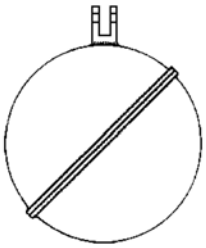
Displacement [dm^3] SC 7 and SC 8					
diameter/height mm	200/200	240/240	280/280	305/305	340/340
displacement dm^3	5.5	9.5	15	19.4	26.3

Dimensions [mm] SC 7 and SC 8					
diameter mm	380	420	460	500	600
height mm	380	420	460	500	600
internal tube ø mm	20	20	20	24	24
filling screw G	3/4	3/4	3/4	3/4	3/4
weight kg	5.8	6.9	9.9	11.8	17

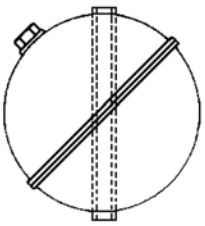
Buoyancy [kg] SC 7 and SC 8					
diameter/height mm	380/380	420/420	460/460	500/500	600/600
buoyancy kg	31.2	42.1	55.1	71.2	130

Displacement [dm^3] SC 7 and SC 8					
diameter/height mm	380/380	420/420	460/460	500/500	600/600
displacement dm^3	37	49	65	83	147

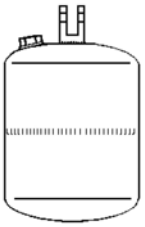
SC 3
with fork, without drain screw,
for pressure vessels



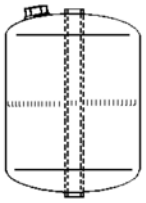
SC 4
with internal tube and drain screw,
for pressure vessels



SC 7
with fork and drain screw,
for depressurised vessels



SC 8
with internal tube and drain screw,
for depressurised vessels



Special designs on request.
The pressure has always been indicated as overpressure.
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Spare Parts

We guarantee 25 years of availability of spare parts for Mankenberg stainless steel valves. Together with your valve serial number we save all the relevant data which is important to you. If you require spare parts or maintenance kits we are able to make the necessary single parts or maintenance kits available to you as soon as possible up to 25 years after purchase of the valve.

Service Abo

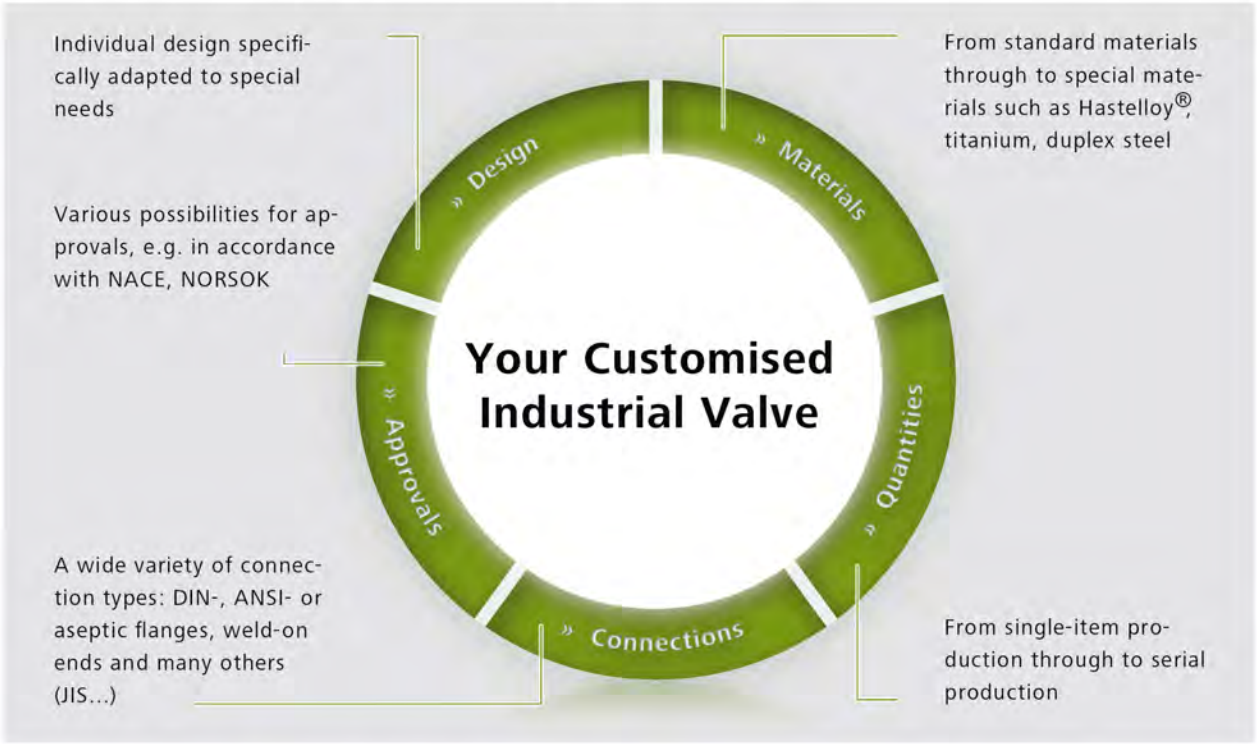
Do you remember the regular maintenance dates for your valves? Should you wish to be reminded of the next due inspection dates, we would be happy to oblige. Feel free to contact us.

Our service department is at your disposal!

Our experienced and fully trained service team are available to give advice on our service hotline:

Customer-specific solutions are individually designed valves for our customer's special requirements. Mankenberg checks with every enquiry the customer-specific technical ope-rating data and subsequently quotes the technical solution. If the operating data require solutions which cannot be realised with Mankenberg standard valves, our engineers will be happy to develop special solutions in accordance with our customer's enquiry. This may lead to either slightly modified valve type series or to a complex system.

Your Operating Data Determines the Solution.



Discover our strength also in this case and send us your enquiry.


Approvals and Certificates

MANKENBERG

Inspection Certificates and Material Certificates

- EN 10204/2.1
- EN 10204/2.2
- EN 10204/3.1
- EN 10204/3.2

Acceptances

- TÜV
- Germanischer Lloyd
- Lloyd's Register of Shipping
- Bureau Veritas (BV)
- Det Norske Veritas (DNV)
- Registro Italiano Navale
- American Bureau of Shipping (ABS)

Approvals and Certifications

- ISO 9001 since 1994
- Pressure Equipment Directive 97/23/EG
- AD-2000 sheet HP0
- Environmental Management System EN 14001
- Occupational Health & Safety Management BS OHSAS 18001
- Areva Standard IAEA 50-C-Q
- VGB certificate as per 1401
- Ghost-R und Rostechnadzor
- Penetration test step 2 (PT) as per DIN 473

Certified welders

- DIN EN ISO 3834-2
- AD2000-HP3
- EN 287-1
- DIN EN 1418
- EN 9606-5
- ASME

Welding Procedure Tests

- AD2000-HP5/2
- DIN EN ISO 15614-1
- DIN EN ISO 15614-5
- others on request

On Request

- Norsok (Norsk Sokkels Konkuranseposisjon)
- NACE (National Association of Corrosion Engineers)
- ANSI (American National Standards Institute)
- ASME (American Society of Mechanical Engineers)
- API (American Petroleum Institute)
- JIS (Japan Industrial Standard)

Please contact us for any question you may have.

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