

VUS: Flanged through valve, PN 40

How energy efficiency is improved

Accurate control with high reliability.

Areas of application

Continuous control of cold/warm/hot water, water vapour and air in HVAC systems, in closed networks. Water quality as per VDI 2035. Assembly with AVP 242 to AVP 244 actuators as a regulating unit.

Features

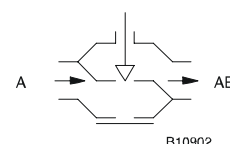
- Nominal pressure 40 bar
- Control valve contains no silicone grease; matt black
- Nominal diameters DN15 to DN150
- Equal-percentage characteristic
- With the spindle pressed in, the valve is closed
- Closes only against the pressure
- Temperature range up to 220°C
- Version with bellows down to -60°C, version with graphite seal up to 260°C

Technical description

- Valve with flange connection as per EN 1092-2, Form B raised face
- Cast steel valve body
- Stainless steel valve seat
- Stainless steel spindle
- Stainless steel plug
- Maintenance-free stainless steel stuffing box with spring-loaded Teflon washer



Y07544



Type	Nominal diameter DN	Connection PN	k _{VS} value m³/h	Weight kg
VUS 015 F375	15	40	0.16	5.1
VUS 015 F365	15	40	0.25	5.1
VUS 015 F355	15	40	0.40	5.1
VUS 015 F345	15	40	0.63	5.1
VUS 015 F335	15	40	1.0	5.1
VUS 015 F325	15	40	1.6	5.1
VUS 015 F315	15	40	2.5	5.1
VUS 015 F305	15	40	4.0	5.1
VUS 020 F305	20	40	6.3	5.9
VUS 025 F305	25	40	10.0	6.8
VUS 032 F305	32	40	16.0	8.4
VUS 040 F305	40	40	25.0	10.6
VUS 050 F305	50	40	40.0	13.2
VUS 065 F305	65	40	63.0	18.6
VUS 080 F305	80	40	100.0	25.1
VUS 100 F305	100	40	160.0	36.4
VUS 125 F305	125	40	220.0	56.4
VUS 150 F305	150	40	320.0	77.9

Operating temperature ¹⁾	-10...220°C	Valve stroke	
Operating pressure ²⁾		DN 15...50	20 mm
at -10...50°C	40.0 bar	DN 65...100	30 mm
at 120°C	36.3 bar	DN 125...150	40 mm
at 220°C	29.4 bar	Dimension drawing	M10461
Valve characteristic	equal-percentage	Fitting instructions	MV 506071
Valve control ratio	> 50:1	AVP 242 assembly	MV 506012
Packing box	stainless steel/Teflon	AVP 243/244 assembly	MV 506013
Leakage rate at max. Δps:	≤ 0.05% of k _{VS} value	Declaration on materials	MD 76.125

¹⁾ Down to -10°C, no stuffing box heater is required. At temperatures between -10°C and -60°C, use special version with bellows-type mechanical seal (available on request, only to DN 100). Application: water with anti-freeze (glycol to 55% and brine solution), max. operating pressure 30 bar.

Above 130°C or 180°C, use the relevant adaptor (accessory). Above 220°C and up to 260°C, use stuffing box with graphite seal (accessory).

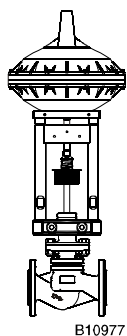
²⁾ For operating pressure, see table of pressure and temperature values

Accessories0372336 180* Adaptor (required for media 130...180°C; [MV 505902](#))0372336 240* Adaptor (required for media 180...240°C; [MV 505902](#))0378373 001 Stuffing box with graphite seal for temp. 220...260°C; DN 15...50; [MV 506080](#)0378373 002 Stuffing box with graphite seal for temp. 220...260°C; DN 65...100; [MV 506080](#)0378373 003 Stuffing box with graphite seal for temp. 220...260°C; DN 125...150; [MV 506080](#)

*) Dimension drawing or wiring diagram are available under the same number

Warranty The technical data and pressure differences stated above apply only when used in combination with Sauter actuators. If used together with actuators of a different manufacturer, the warranty becomes invalid.

N.B.: These valves should be used only for closing against the pressure.

VUS combined with pneumatic actuator

Actuator		AVP 242 F021	
Pressure p_{stat}		32 bar	
Running time:		8 s	
Stroke:		20 mm	
Valve	Against the pressure		
	Δp_{max}	Δp_s	
VUS 015	15,5	15,5	
VUS 020	15,5	15,5	
VUS 025	9,5	9,5	
VUS 032	7,2	7,2	
VUS 040	4,1	4,1	
VUS 050	2,7	2,7	

For temperatures above 130°C, accessories are required

Valve	Actuator Pressure p_{stat} Running time: Stroke:		Against the pressure Δp_{max} Δp_s	
	AVP 243 F021 40 bar 24 s 20 mm		AVP 244 F021 40 bar 40 s 20 mm	
VUS 015	21,7	21,7	40,0	40,0
VUS 020	21,7	21,7	40,0	40,0
VUS 025	13,1	13,1	26,2	26,2
VUS 032	10,0	10,0	19,9	19,9
VUS 040	5,7	5,7	11,4	11,4
VUS 050	3,7	3,7	7,4	7,4

For temperatures above 130°C, accessories are required

Valve	Actuator Pressure p_{stat} Running time: Stroke:		Against the pressure Δp_{max} Δp_s	
	AVP 243 F031 25 bar 24 s 30 mm / 40 mm		AVP 244 F031 40 bar 40 s 30 mm / 40 mm	
VUS 065	2,2	2,2	4,4	4,4
VUS 080	1,5	1,5	2,9	2,9
VUS 100	1,0	1,0	1,5	1,9
VUS 125	0,6	0,6	1,0	1,2
VUS 150	0,4	0,4	0,6	0,8

For temperatures above 130°C, accessories are required

Valve: For F-variant, technical data and accessories see table of valve types.

Actuator: For F-variant, technical data, accessories and fitting position, see table of valve types.

Example: VUS 040 F305/AVP 242 F021 or AVP 243 F021

Valve is closed when actuator is pressureless = factory setting

Valve is open when actuator is pressureless = on request

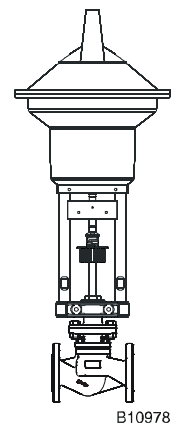
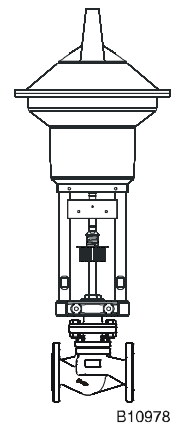
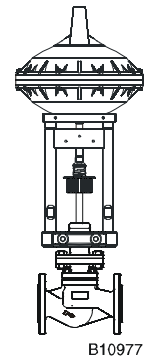
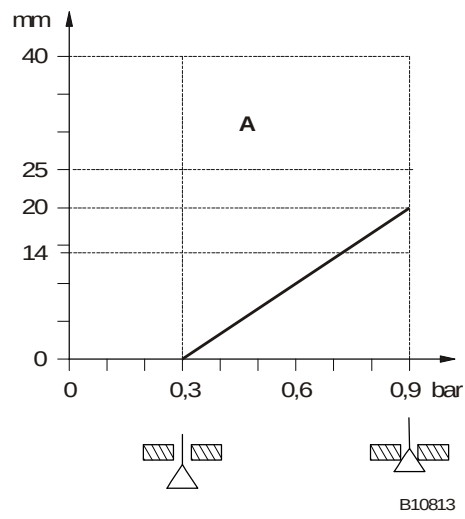
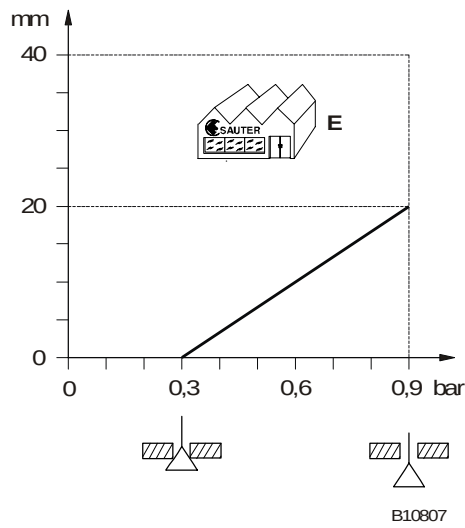
Δp_{max} [bar]= Max. permissible pressure difference across the valve at which the drive can still firmly open and close the valve while taking Δp_v into account.

Δp_s [bar]= Max. permissible pressure difference across the valve at which, in the event of a malfunction (pipe break after the valve), the drive can close the valve firmly and quickly.

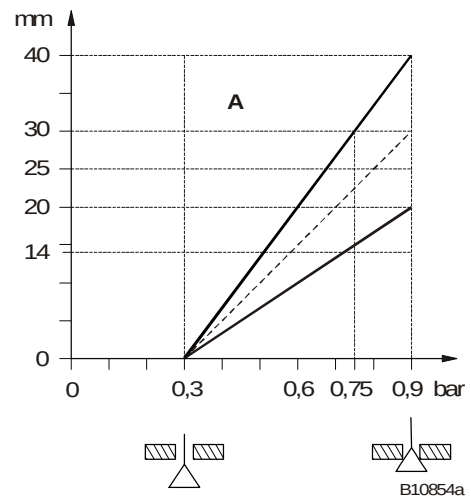
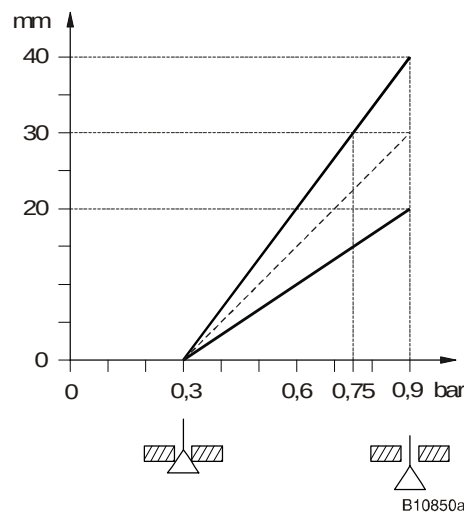
Pressure/stroke characteristics (with valve fitted)

Characteristic is not variable

DN15...50:



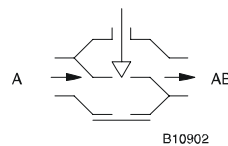
DN65...150:
Characteristic is variable



Operation

Using a pneumatic drive, the valve can be moved to any position. The valve's control passage closes when the valve spindle is retracted. These valves can be used to close against the pressure. Please observe the direction of flow marked on the valve itself. 'Closure with the pressure' is not permissible for pneumatic drives. Fluidic variables in accordance with EN 60534.

Closes against the pressure



Description

These control valves are distinguished by their great reliability and accuracy and make an important contribution towards efficient control. They run very quietly and meet sophisticated requirements, e.g. provide closing functions with spring, overcome differential pressures, control the temperature of the medium and provide a cut-off function.

The valve spindle is fixed to the drive spindle automatically. The stainless-steel plug regulates an equal-percentage throughflow in the control passage. The valve's high level of seal is guaranteed by a stainless-steel ring pressed into the valve seat and by the appropriate valve plug.

The stuffing box requires no maintenance. It comprises conically formed Teflon rings and a spring. The spring ensures a permanent tension on the seals, which guarantees their tightness with regard to the valve spindle. In addition, a supply of grease ensures that the valve spindle is always lubricated. Furthermore, the grease prevents any particles in the medium from reaching the Teflon seal.

Engineering and fitting notes

The valves are combined with the pneumatic actuators AVP 242, 243 and 244. The actuator is slotted onto the valve and fixed with screws. The pneumatic actuator links with the valve spindle automatically when the former is pressurised with compressed air. The mechanism automatically closes the connection to the valve as soon as it has reached the lower valve seat.

The closing point should be set as described in the fitting instructions (MV50602 for AVP 242 or MV 506013 for AVP 243, 244).

Fitting position

The control unit can be fitted in any position except facing downwards. The ingress of condensate, drops of water etc. into the drive should be prevented. If fitted horizontally, and with regard to the valve spindle, the maximum permissible weight on the valve is 25 kg unless the actuator is supported (to be carried out by the client) or is subject to forces acting otherwise.

Up to 130°C In any position except facing downwards.

Above 130°C At temperatures above 130°C or 180°C, the valve should be fitted in the horizontal position and the correct adaptor for the relevant temperature should be employed. The adaptor can also serve as an extension, allowing the actuator to protrude from the piping insulation. To protect the actuator against heat, the pipes should be insulated.

When fitting the drive to the valve, care must be taken not to turn the valve plug on the stainless-steel seat, otherwise the seal may be damaged. When insulating the valve, the insulation should not extend beyond the connecting clamp on the drive.

Fitting outdoors

If the devices are fitted outdoors, we recommend that additional measures be taken to protect them against the effects of the weather.

Using with steam

The valves can be used for steam applications up to 200°C with the same $\Delta p_{\max}$ values. We recommend, however, that the valves be used only for open/close operations. When used as a control valve, care should be taken to ensure that valve does not function largely in the bottom third of its stroke range. This results in an extremely high flow speed, which greatly reduces the valve's serviceable life.

Using with water

In order to restrain contaminants in the water (e.g. welding beads, rust particles etc.) and prevent the spindle seal from being damaged, we recommend the employment of collective filters, e.g. for each floor or feed pipe. The composition of the water should be in accordance with VDI 2035. If an auxiliary medium is used, please contact the supplier of the medium in order to clarify whether the valve materials are compatible. Please refer to the materials table below. If glycol is used, we recommend a concentration of between 20% and 55%. The valves are not suitable for use with drinking water or in zones where there is a risk of explosion.

Other notes concerning hydraulics and noise in installations

The valves can be employed in a low-noise environment. To prevent noise, the $\Delta p_{\max}$ pressure differences listed below should not be exceeded. These values are listed as recommended values in the table of pressure losses.

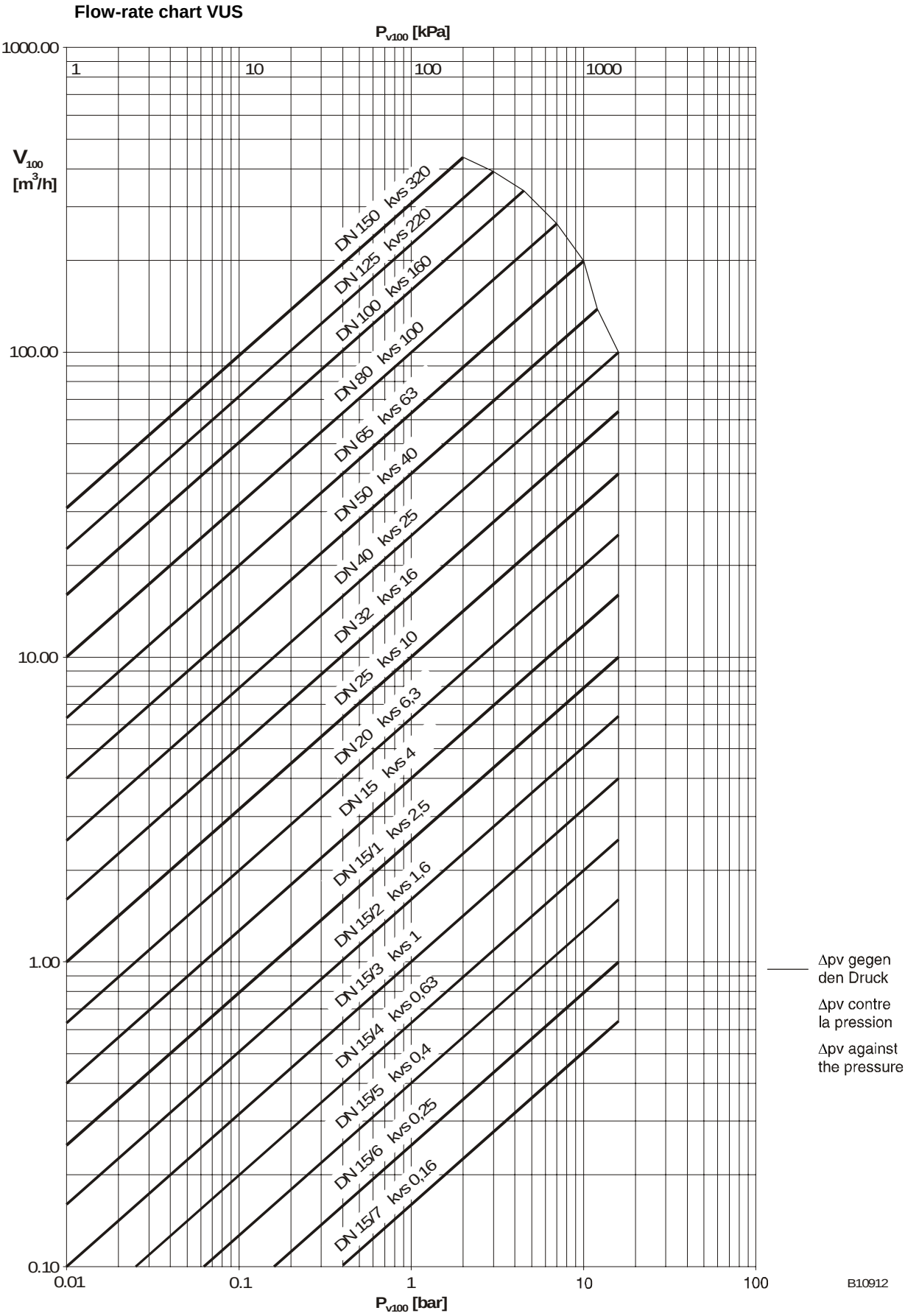
The pressure difference Δp_v is the highest pressure permitted to act on the valve, regardless of the stroke position, so that the risk of cavitation and erosion is limited. The force of the actuator has no influence on these values. Cavitation accelerates wear and causes noise. In order to prevent cavitation, particularly in applications with steam, the pressure difference $\Delta p_{\max}$ should not exceed the value

$$\Delta p_{\text{crit}} = (p_1 - p_v) \times 0,5$$

p_1 = Upstream pressure before the valve (bar)

p_v = Steam pressure

Absolute pressure was used in these calculations.



Additional technical data

Type	Δp_v	
	Against the pressure	With the pressure
VUS 015 F375	40 bar	—
VUS 015 F365	40 bar	—
VUS 015 F355	40 bar	—
VUS 015 F345	40 bar	—
VUS 015 F335	40 bar	—
VUS 015 F325	40 bar	—
VUS 015 F315	40 bar	—
VUS 015 F305	40 bar	—
VUS 020 F305	40 bar	—
VUS 025 F305	40 bar	—
VUS 032 F305	40 bar	—
VUS 040 F305	30 bar	—
VUS 050 F305	20 bar	—
VUS 065 F305	8 bar	—
VUS 080 F305	4 bar	—
VUS 100 F305	1.5 bar	—
VUS 125 F305	1 bar	—
VUS 150 F305	0.7 bar	—

Pressure and temperature specifications

Flow parameters

Sauter slide rule for valve sizing

Slide rule manual

Technical manual: 'Valves and drives'

Parameters, Installation Notes, Control, General Information

EN 764, EN 1333

EN 60534 (Page 2)

7 090011 003

7 000129 003

7 000477 003

Valid EN, DIN,
AD, TRD and UVV
regulations

97/23/EG

Category II

CE conformity, Directive on Pressure Equipment (Fluid Group II)

VUS 15 to VUS 150

CE-0525 mark

Combination: AVN 224S actuator, not certified as per DIN 32730 or EN 14597

Additional details on model types

Valve body of cast steel as per DIN EN 10213, code GP240GH+N, material number 1.0619+N, with smooth-drilled flanges as per EN 1092-1, Form B sealing strip. Valve body protected by matt black paint (RAL 9005). Recommended for the welding-neck flange as per EN 1092-1. Valve fitting width as per EN 558-1, Series 1. Flat seal on the body of the valve is of asbestos-free material.

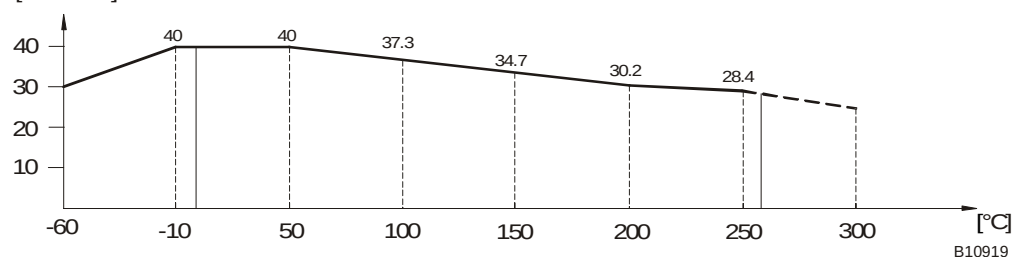
PTFE collar and sealing ring available for stuffing box as spare parts under order number 0378372

Material numbers as per DIN

	DIN material no.	DIN code
Valve body	1.0619+N	GP240GH+N
Valve seat k_{VS} 2.5... k_{VS} 320	1.4021	X 20 Cr 13
k_{VS} 0.16... k_{VS} 1.6	1.4571	X 6 Cr Ni Mo Ti 17 12 2
Spindle k_{VS} 2.5... k_{VS} 320	1.4021	X 20 Cr 13
k_{VS} 0.16... k_{VS} 1.6	1.4571	X 6 Cr Ni Mo Ti 17 12 2
Plug k_{VS} 2.5... k_{VS}	1.4021	X 20 Cr 13
k_{VS} 0.16... k_{VS} 1.6	1.4571	X 6 Cr Ni Mo Ti 17 12 2
Stuffing box	1.4021	X 20 Cr 13
Seal underneath packing box	Cu	DIN 7603

Pressure/temperature relationship

[bar / bars]



B10919

Explanation of terms used

Δp_v

Maximum permissible pressure difference across the valve in any stroke position, limited by the noise level and erosion.

The valve as a traversed element is defined by this parameter specifically in its hydraulic behaviour. By monitoring cavitation, erosion and the noise thus produced, improvements can be achieved in both life expectancy and durability.

Δp_{max}

Maximum permissible pressure difference across the valve at which the drive can firmly open and close the valve.

Static pressure and fluidic influences are taken into account. This value helps to maintain a smooth stroke action and the high level of sealing. In doing so, the valve's Δp_v value is never exceeded.

Δp_s

Maximum permissible pressure difference across the valve in the event of a malfunction (e.g. power failure, excess temperature or pressure, burst pipe) at which the drive can firmly close the valve and, if necessary, hold the full operating pressure against atmospheric pressure. Since this is a quick-close functions with 'fast' stroke, Δp_s can be larger than Δp_{max} or, respectively, Δp_v . The resultant fluidic disturbances are soon overcome and play a minor role here.

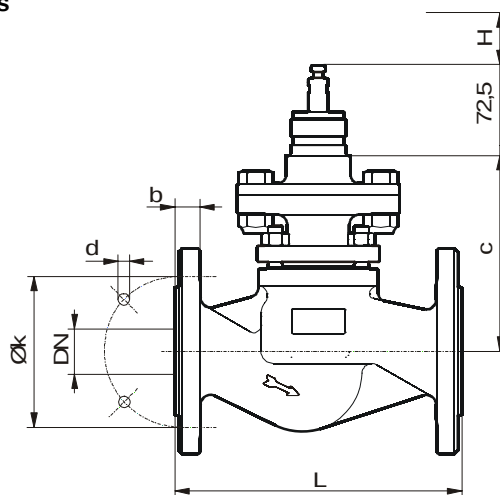
On the three-way valves, the values apply only for the control passage.

Δp_{stat}

Line pressure across the valve. This corresponds largely to the dead pressure when the pump is switched off, e.g. due to the level of liquid in the installation, an increase in pressure via the pressure store, steam pressure etc.

For valves that close with the pressure, the static pressure plus the pump pressure should be used.

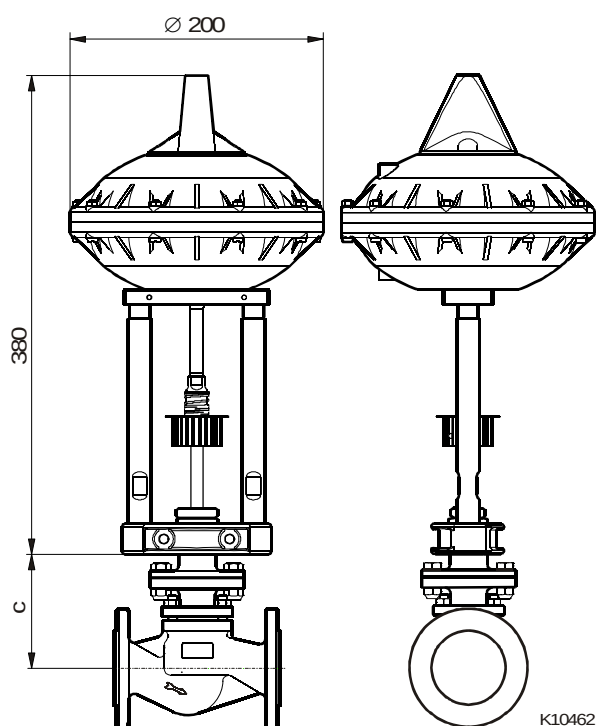
Dimension drawings



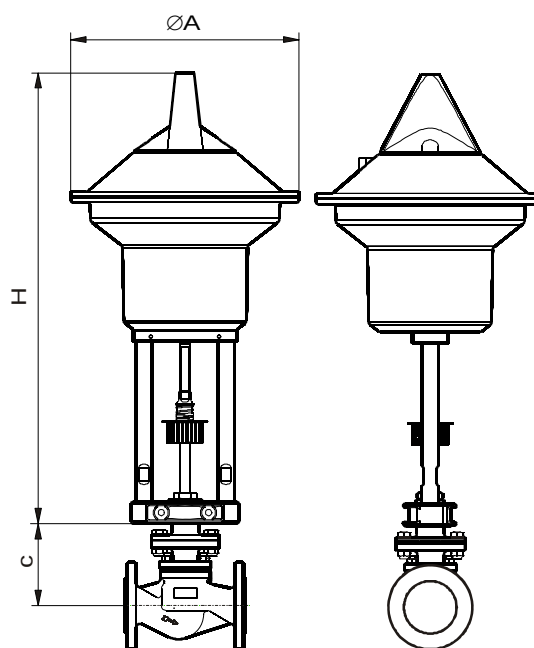
VUS	DN	c	L	H	k	d	b
015	15	135	130	20	65	14 x 4	16
020	20	135	150	20	75	14 x 4	18
025	25	143	160	20	85	14 x 4	18
032	32	143	180	20	100	19 x 4	18
040	40	150	200	20	110	19 x 4	18
050	50	156	230	20	125	19 x 4	20
065	65	169	290	30	145	19 x 8	22
080	80	184	310	30	160	19 x 8	24
100	100	203	350	30	190	23 x 8	24
125	125	242	400	40	220	28 x 8	26
150	150	302	480	40	250	28 x 8	28

M10461a

AVP 242



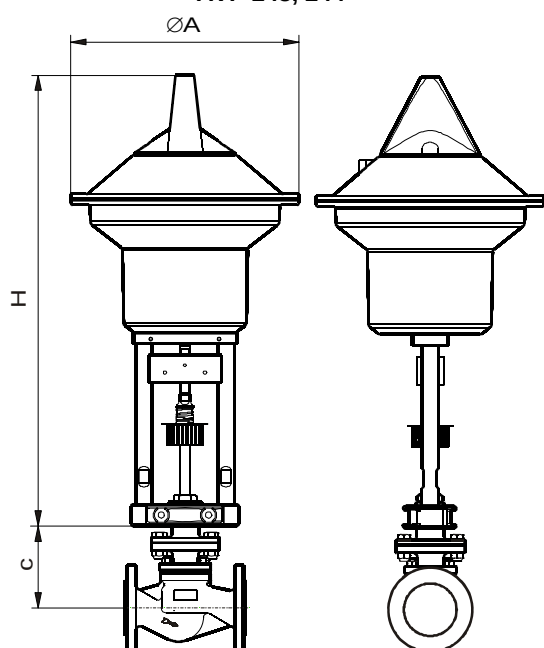
AVP 243, 244



AVP ...	A	H
243 F021	250	497
243 F031	250	517
244 F021	335	536
244 F031	335	556

K10463

AVP 243, 244

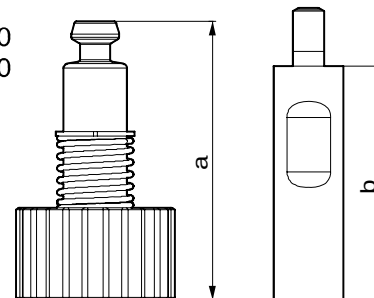


AVP ...	A	H
243 F021	250	497
243 F031	250	517
244 F021	335	536
244 F031	335	556

K10464

Accessories

0372336 180
0372336 240



0372336	T (°C)	a (mm)	b (mm)
180	180	69,4	60
240	260	109,4	100

Z10219