

VUP: Pressure-relieved through flanged valve, PN 25

Control valve, free of silicone grease, with pressure compensation, for continuous/modulating control of cold, warm or hot water, steam or air. Water quality to VDI 2035. Together with valve drives AVM 234S, AVF 234S and AVN 224S as regulating unit. Valve tested to DIN 32730 ¹⁾.

Valve body made of spheroidal-graphite cast (EN-GJS-400-18-LT), galvanised black. Stem, valve seat and cone made of stainless steel, metal-to-metal seal. Stuffing box made of brass with Teflon/Viton/Teflon, spring-loaded. Valve characteristic is equal-percentage, can be switched over to linear or quadratic with SUT valve drives. Closing procedure only against the pressure, the valve is closed when the spindle is retracted.

Type	Nominal diameter DN	Connection	k _{VS} value m ³ /h	Weight kg
VUP 040 F304	40	PN 25	25	10
VUP 050 F304	50	PN 25	40	14
VUP 065 F304	65	PN 25	63	18
VUP 080 F304	80	PN 25	100	25.5
VUP 100 F304	100	PN 25	160	36.5
VUP 125 F304	125	PN 25	250	56.5
VUP 150 F304	150	PN 25	350	84.5

Operating temperature ¹⁾	-20...200 °C	Valve stroke	
Operating pressure	up to 120 °C 25 bar	DN 40	14 mm
	up to 200 °C 20 bar	DN 50-80	25 mm
	-20...-10 °C 18 bar	DN 100-150	40 mm
Valve characteristic	equal-percentage	Dimension drawing	M10426
Rangeability	> 100:1	Installation instructions	MV 505963
Stuffing box	prestressed	AVM 234 / assembly	MV 505919
Leakage rate at max. Δps:	≤ 0.05% of k _{VS} value	AFM 234 / assembly	MV 505920
		AVN 224 / assembly	MV 505927
		Material declaration	MD 56.122

Accessories

- [0372336 180*](#) Intermediate piece (required for medium > 130 °C / < 180 °C; [MV 505902](#))
- [0372336 240*](#) Intermediate piece (required for medium > 180 °C / < 200 °C; [MV 505902](#))
- [0378284 100*](#) Stuffing box heater, 230 V~; 15 W, for media below 0 °C; [MV 505978](#)
- [0378284 102*](#) Stuffing box heater, 24 V~; 15 W, for media below 0 °C; [MV 505978](#)
- [0378356 001](#) Replacement pack for stuffing box, nominal diameter DN 40-80; [MV 505972](#)
- [0378357 001](#) Replacement pack for stuffing box, nominal diameter DN 100-150; [MV 505972](#)

¹⁾ Dimension drawing or wiring diagram available under the same number

- ¹⁾ At temperatures below 0 °C, use the stuffing box heater; at temperatures above 130 °C or 180 °C use the appropriate intermediate piece (accessory).
For use in accordance with DIN 32730, the permissible temperature of the medium is > 0 °C.

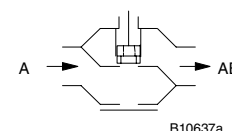
Warranty The technical data and pressure differences indicated here are only applicable in combination with Sauter valve drives. Any warranty shall lapse if valve drives from other manufacturers are used.



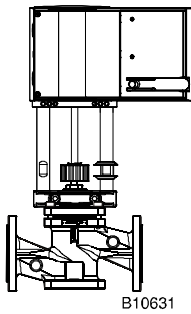
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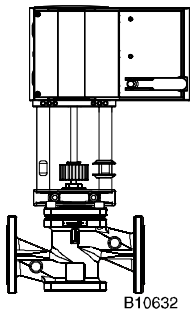


Combination of VUP with electrical drive (combined without 230 V module or accessories)
without spring return, 2500 N pushing force



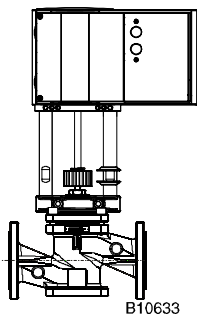
Drive	Closing procedure: against the pressure			
Type:	AVM 234 S F132 (24 V)			
Running time:	2 / 4 / 6 s/mm			
Input:	2pt / 3pt / 0...10 V / 4...20 mA			
Valve	Δp_{\max}	Δp_s	Close/off pressure	
VUP 040	25	–	25	
VUP 050	25	–	25	
VUP 065	25	–	25	
VUP 080	25	–	25	
VUP 100	25	–	25	
VUP 125	19	–	25	
VUP 150	15	–	25	

With spring return, 2000 N pushing force



Drive	Closing procedure: against the pressure			
Type:	AVF 234 S F232 (24 V)			
Running time:	2 / 4 / 6 s/mm			
Input:	2pt / 3pt / 0...10 V / 4...20 mA			
Spring return:	15 ... 30 s			
Valve	Δp_{\max}	Δp_s	Close/off pressure	
VUP 040	25	25	25	
VUP 050	25	25	25	
VUP 065	25	25	25	
VUP 080	25	25	25	
VUP 100	20	22	22	
VUP 125	14	20	20	
VUP 150	10	15	15	

With emergency function to DIN 32730, 1100 N pushing force



Drive	Closing procedure: against the pressure			
Type:	AVN 224 S F232 (24 V)			
Running time:	2 / 4 / 6 s/mm			
Input:	2pt / 3pt / 0...10 V / 4...20 mA			
Spring return:	15 ... 30 s			
Valve	Δp_{\max} in bar	Δp_s in bar	Close/off in bar	
VUP 040	25	25	25	
VUP 050	20	25	25	
VUP 065	16	17	17	
VUP 080	12	15	15	
VUP 100	9	12	12	
VUP 125	6	6	6	
VUP 150	4	4	4	

Valve: Variant F, for technical data and accessories see Valve Type Table

Drive: Variant F, for technical data, accessories and installation position see section 51

Example: VUP 040 F304 / AVF 234 S F232

Δp_{\max} [bar]= Maximum permitted pressure difference over the valve at which the drive can still reliably open and close the valve, taking account of Δp_v .

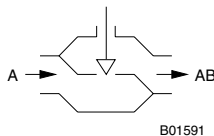
Δp_s [bar]= Maximum permitted pressure difference over the valve in case of a fault (pipe break downstream of the valve) at which the drive can close the valve reliably with "fast" performance of the stroke.

Close/off pressure [bar]= Maximum possible pressure difference over the valve in control mode, at which the drive can still open and close the valve. A reduced lifetime must be expected with this mode. Cavitation, erosion and pressure surges can damage the valve. The values are only valid for the assembled combination valve fitted on the drive.

Function

The valve can be controlled into any desired intermediate position by means of an electrical drive. If the valve stem is retracted, the valve is closed. The direction of flow marked on the valve must be observed because it must only be used in the 'against the pressure' closing direction (the sticker is on the installation instructions). Parameters related to flow mechanics conform to EN 60534.

Closing procedure against the pressure



Description

These valves are used for high differential pressure, and standard valve drives can be used thanks to the pressure compensation. An automatic and fixed connection is made between the valve stem and the drive shaft. The cone is designed as a piston. Depending on the nominal diameter, the upstream pressure is fed to the rear side of the cone via two or more bores in the cone. The forces acting on the cone are cancelled out up to the area of the cone rod surface (stem surface). The pressure-relieved cone is also sealed against the outlet. Thanks to this design, only very little flow occurs in the pressure relief area. The risk that the pressure relief might be impaired by possible contamination is therefore reduced to the minimum.

The stuffing box is maintenance-free. Between a Viton seal and a spring, two slightly conically-shaped flat seals are inserted. The spring ensures constant tension in the seals so that tightness against the valve stem is guaranteed. In addition, a glycerine grease reserve ensures continuous lubrication of the valve stem. Also, the glycerine grease reserve also prevents any particles that might be present in the medium from reaching as far as the Teflon seal.

Engineering and installation notes

The valves are combined with the AVM 234 S valve drives without spring return action, or valve drives AVF 234 S, AVN 224 S with spring return. The drive is placed directly on top of the valve and is fixed with screws. The connection between the drive and the valve stem is made automatically. When the plant is operated for the first time, the drive moves out and the lock automatically closes when it has reached the valve stem. The valve stroke is also detected by the drive and no further adjustments are required. The force-dependent switch-off in the drive always ensures minimal leakage. With the SUT valve drives, the characteristic can be changed over to linear or quadratic as desired, starting out from equal-percentage.

If AVN 224 S valve drives are used, the drive has to be initialised manually. For a more precise description of this, see PDS 51.379 'Initialisation and feedback signal'.

Installation position

The final control element can be installed in any desired position, but the an installed position facing downwards is not recommended. Condensate and water drips etc. must be prevented from penetrating into the drive. With a horizontal installed position, the permitted maximum weight on the valve is 25 kg unless a support is provided by the customer or others.

up to 130 °C: in any position, but not facing downwards.

above 130 °C: at temperatures above 130 °C or 180 °C respectively, the horizontal installed position is recommended and the intermediate piece corresponding to the temperature must be inserted. However, the intermediate piece can also serve as an extension so as to bring the drive out of the pipe insulation. The pipes must be insulated to protect the valve drive against great heat.

When fitting the drive onto the valve, you must make sure that the cone is not rotated on the stainless steel seat (this would damage the sealing surface). If the valve is insulated, the insulation must only extend as far as the connecting clip of the drive.

Applications with steam

The valves can be used for steam applications up to 200 °C with the same Δp_{max} values shown in the combination tables. However, we advise you only to use the valves for open-closed switching. For use as a control valve, you should make sure that the majority of the work is not done in the lower third of the valve stroke range. In this position, an extremely high flow speed would develop, severely reducing valve's lifetime.

Applications with water

To ensure that impurities in the water (such as welding beads or particles of rust, etc.) are retained and the stem seal is not damaged, it is advisable to install collective filters, e.g. for each storey or pipe run. Water quality requirements conform to VDI 2035. If an additional medium is used, the compatibility of the valve materials must be clarified with the manufacturer of the medium. The Material Table shown below can be used for this purpose. If glycol is used, we recommend that a concentration of between 20% and 55% should be selected.

The valves are not suitable for drinking water or Ex zones.

Approval for DIN 32730

The valves can be used together with the valve drive with emergency function, AVN 224 S, in compliance with DIN 32730.

Other notes concerning hydraulics and noises in systems

The valves can be used in a low-noise environment. To avoid noises, the pressure differences Δp_{\max} listed below should not be exceeded. These are shown as recommended values in the pressure loss table.

Pressure difference Δp_v is the maximum pressure that may be present on the valve, regardless of the stroke position, so that the danger of cavitation and erosion is limited. These values are independent of the drive force. Cavitation accelerates wear and causes noises. To prevent cavitation, which mainly occurs with applications involving vapour or steam, differential pressure Δp_{\max} should not exceed value Δp_{krit} :

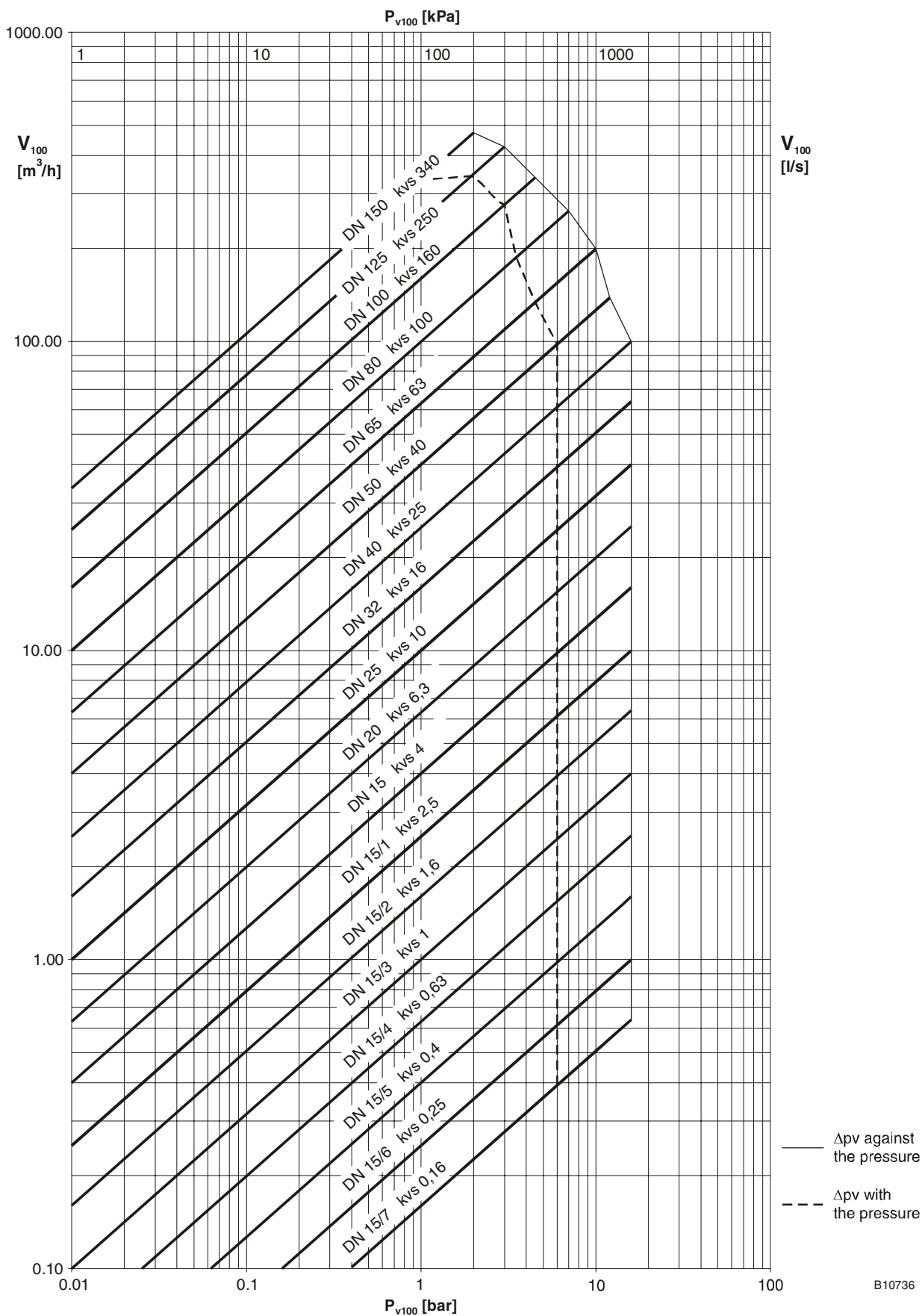
$$\Delta p_{\text{krit}} = (p_1 - p_v) \times 0.5$$

p_1 = upstream pressure in front of the valve (bar) p_v = steam/vapour pressure

Absolute pressure is used for the calculations.

The close/off pressure values which are also listed represent the maximum pressures at which the drive can still use its own force to move the valve. It should be pointed out here that if these pressures are used and the pressure difference Δp_{\max} is exceeded, the valve may sustain damage due to cavitation and erosion. In case of a spring return function, the stated Δp_s values also represent the permitted differential pressure up to which the drive guarantees closure of the valve in case of an incident. As this is a safety function with 'fast' passage through the stroke (by means of the spring), this value may exceed Δp_{\max} .

Flow- rate chart VUP



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Additional technical data

Technical information

- Pressure and temperature data		EN 764, EN1333
- Parameters related to flow mechanics		EN 60534
- Sauter slide rule for valve dimensioning		7 090011 003
- Manual for slide rule		7 000129 003
- PC programme for valve and drive dimensioning		7 000675 003
- Valvedim.exe		
- Technical manual: 'Regulating Units'		7 000477 003
- Parameters, installation notes, control, general		Valid EN, DIN, AD, TRD and UVV regulations
- CE conformity, Pressure Equipment Directive (fluid group II)		97/23/EC
VUP 040:	CE-0035 symbol	Article 33
From VUP 050 onwards:	CE-0035 symbol	Category I
VUP ... with AVN 224 S F132:	CE-0035 symbol	Category IV DIN 32730

Additional information on execution

Valve body made of spheroidal-graphite cast to EN 1563. Code EN-GJS-400-18-LT. Material number EN-JS1025 with smooth drilled flanges to EN 1092-2, form B, sealing strip. Valve body protected against corrosion by black galvanisation to RAL 9005, dark black. Recommendation for the welding-neck flange as per EN 1092-1. Overall valve length to EN 558-1, basic series 1. Flat seal on valve body made of asbestos-free material. Stuffing box made of brass, spring-tensioned with Teflon / Viton / Teflon packing.

DIN material numbers

	DIN material number	DIN designation
Valve body	EN-JS1025	EN-GJS-400-18-LT (GGG40.3)
Valve seat	1.4305	X 8 Cr Ni S 18-9
Stem	1.4305	X 8 Cr Ni S 18-9
Cone	1.4305	X 8 Cr Ni S 18-9
Stuffing box	CW614N	Cu Zn 39 Pb 3 F36
Seal upper part/valve body		Viton
Lip ring		PTFE

Amplified information on pressure difference definitions

Δp_v :

Maximum permitted pressure difference over the valve for every position of the stroke, limited by noise level and erosion.

This parameter specifically characterises the hydraulic behaviour of the valve as an element through which a flow passes. Monitoring of cavitation and erosion, and the associated development of noise, will improve the valve's lifetime as well as its usability.

Δp_{max} :

Maximum permitted pressure difference over the valve at which the drive can reliably open and close the valve.

The following are taken into account: static pressure and influences related to flow mechanics. Faultless performance of the stroke and tightness are guaranteed with this value, and in no case is valve value Δp_v exceeded.

Δp_s :

Maximum permitted pressure difference over the valve in case of a fault (such as a voltage failure, excessive increase in temperature and pressure, and pipe break) at which the drive can close the valve tightly and can hold the full operating pressure against atmospheric pressure if need be. As this is a safety function with a 'fast' performance of the stroke, Δp_s may be greater than Δp_{max} or Δp_v . The disruptive influences arising here in connection with flow mechanics are quickly passed through, and are of secondary importance in this functioning mode.

For three-way valves, the values only apply to the control passage.

Δp_{stat} :

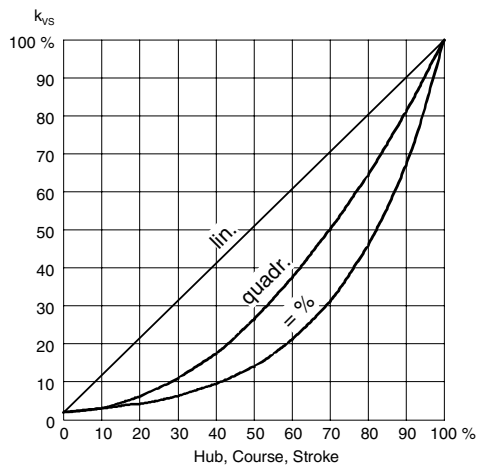
Pipe pressure upstream of the valve. Essentially corresponds to the dead pressure with the pump switched off, caused (for example) by the fluid level in the system, increase in pressure due to the pressure tank, steam pressure, etc.

Characteristic for drives with a positioner (only 24 V)

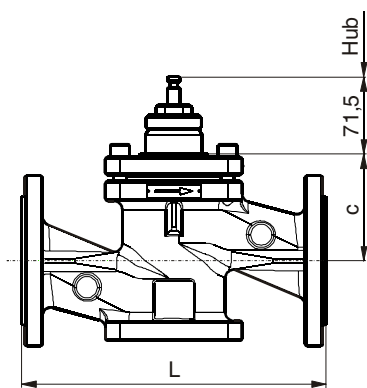
On drive AVM 234 S, AVF 234 S or AVN 224 S

Equal-percentage / linear / quadratic

Can be set with the code switch

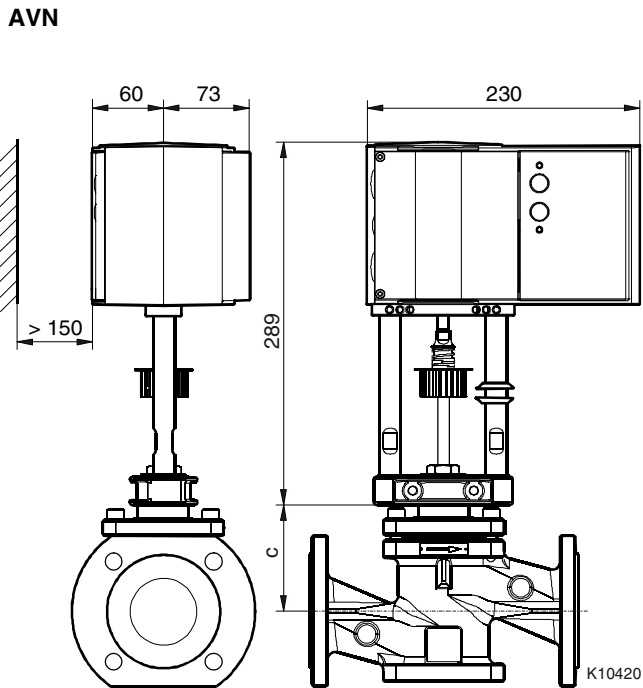
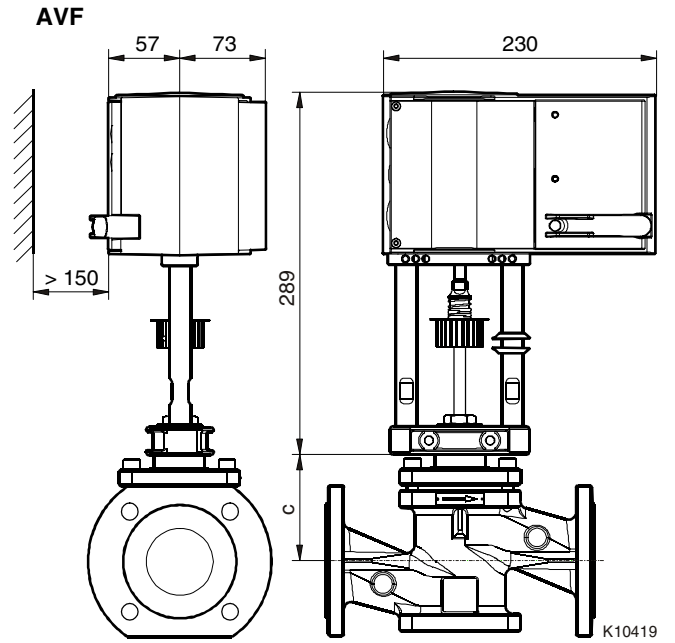
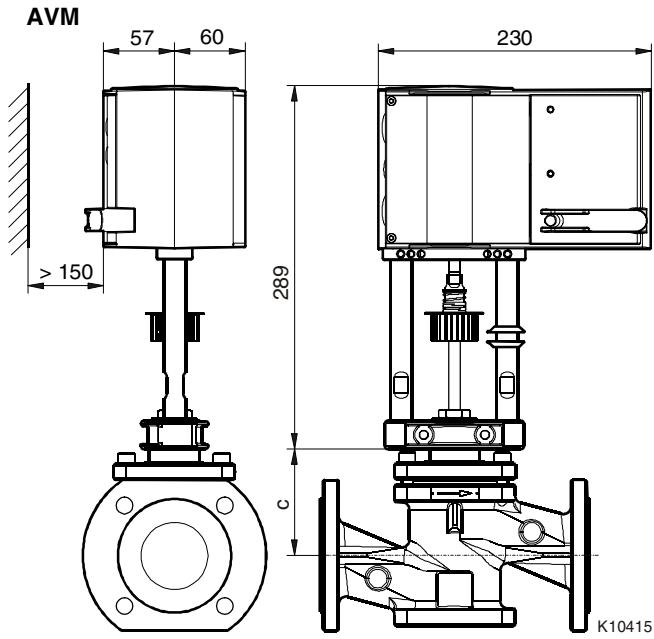


Dimension drawings



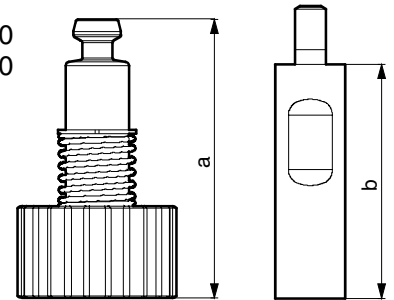
VUP	c	L	Hub
DN 040	88,5	200	13
DN 050	103	230	25
DN 065	104	290	25
DN 080	110	310	25
DN 100	183	350	42
DN 125	202	400	42
DN 150	222	480	42

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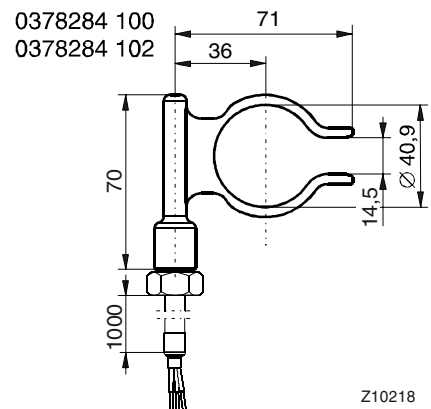
Accessories

0372336 180
0372336 240



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

M10217



Z10218