

VUS: Through flanged valve, PN 40

How energy efficiency is improved admissible

Precision control with high level of reliability means efficiency.

Areas of application

Continuous control of cold, warm, hot water and steam in HVAC systems, in closed networks. Water quality as per VDI 2035. Together with actuators AVM 234S and AVF 234S as regulating unit. These valves are not suitable for drinking water or potentially explosive atmospheres.

Features

- Nominal pressure 40 bar
- Control valve, contains no silicone grease; matt black
- Nominal diameters DN 15 to DN 150
- Equal percentage characteristic, adjustable with SUT actuators to linear or quadratic
- With the spindle retracted, the valve is closed
- Closing procedure only against pressure
- Temperature range up to 260 °C

Technical description

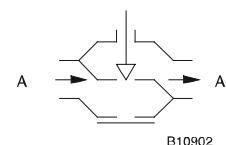
- Valve with flange connection as per EN 1092-2, Form B, raised face
- Cast steel valve body
- Stainless steel valve seat
- Stainless steel spindle
- Stainless steel cone
- Maintenance-free stuffing box, made of stainless steel, with spring-loaded PTFE washer up to 220 °C, with graphite seal up to 260 °C



T10653



Y07544



B10902

Type	Nominal diameter	Connection	k_{VS} value	Weight
	DN			
VUS015F375	15	40	0.16	5.1
VUS015F365	15	40	0.25	5.1
VUS015F355	15	40	0.40	5.1
VUS015F345	15	40	0.63	5.1
VUS015F335	15	40	1.0	5.1
VUS015F325	15	40	1.6	5.1
VUS015F315	15	40	2.5	5.1
VUS015F305	15	40	4.0	5.1
VUS020F305	20	40	6.3	5.9
VUS025F305	25	40	10.0	6.8
VUS032F305	32	40	16.0	8.4
VUS040F305	40	40	25.0	10.6
VUS050F305	50	40	40.0	13.2
VUS065F305	65	40	63.0	18.6
VUS080F305	80	40	100.0	25.1
VUS100F305	100	40	160.0	36.4
VUS125F305	125	40	220.0	56.4
VUS150F305	150	40	320.0	77.9

Operating temperature ¹⁾	-10...260 °C	Valve stroke	
Operating pressure		DN 15...50	20 mm
at -10...50 °C	40.0 bar	DN 65...100	30 mm
120 °C	36.3 bar	DN 125...150	40 mm
220 °C	29.4 bar	Dimension drawing	M10461
260 °C	27.8 bar	Fitting instructions	MV 506071
Valve characteristic	equal-percentage	AVM 234 assembly	MV 505919
Valve rangeability	> 50:1	AVF 234 assembly	MV 505920
Packing box	stainless steel / PTFE	Material declaration	MD 56.125
Leakage rate at max. Δp_s :	$\leq 0.05\%$ of k_{VS} value		

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).

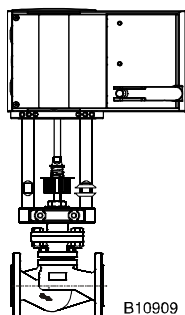
Accessories

- 0372336 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

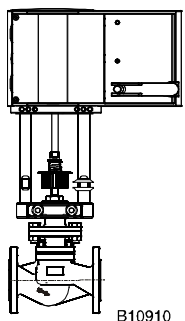
*) Dimension drawing or wiring diagram are available under the same number

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. Valves for closing with the pressure can be ordered on request as a special version.

Combination: VUS with electric drive, 2500 N pushing force

Valve	Against the pressure			Total weight kg
	Δp_{\max}	Δp_s	close/off pressure	
Drive	AVM234SF132			> 130 °C Accessories required
Input:	2-/3-Pt. ; 0...10 V / 4...20 mA ; 24 V ; with accessories 3-Pt. 230 V			
Running time DN 15...50:	40 / 80 / 120 s			
Running time DN 65...100:	60 / 120 / 180s			
Running time DN 125...150:	80 / 160 / 240 s			
VUS015	40.0	—	40.0	9.2
VUS020	40.0	—	40.0	10.0
VUS025	37.8	—	37.8	10.9
VUS032	28.7	—	28.7	12.5
VUS040	16.4	—	16.4	14.7
VUS050	10.5	—	10.5	17.3
VUS065	6.1	—	6.1	22.7
VUS080	3.9	—	4.0	29.2
VUS100	1.5	—	1.5	40.5
VUS125	1.0	—	1.0	60.5
VUS150	0.7	—	1.0	82.0

Combination: VUS with electric drive with spring return, 2000 N pushing force

Valve	Against the pressure			Total weight kg
	Δp_{\max}	Δp_s	close/off pressure	
Drive	AVF234SF232, F132			> 130 °C Accessories required
Input:	2-/3-Pt. ; 0...10 V / 4...20 mA ; 24 V ; with accessories 3-Pt. 230 V			
Running time DN 15...50:	40 / 80 / 120 s			
Running time DN 65...100:	60 / 120 / 180s			
Running time DN 125...150:	80 / 160 / 240 s			
Spring return:	15...30 s, with F232 (NC), with F132 (NO)			
VUS015	40.0	25.0	40.0	10.7
VUS020	40.0	25.0	40.0	11.5
VUS025	29.6	25.0	29.6	12.4
VUS032	22.5	21.0	22.5	14.0
VUS040	12.8	13.5	12.8	16.2
VUS050	8.2	8.5	8.2	18.8
VUS065	4.7	5.6	4.7	24.2
VUS080	3.0	3.4	3.0	30.7
VUS100	1.5	2.2	1.5	42.0
VUS125	1.0	1.6	1.0	62.0
VUS150	0.7	1.2	0.7	83.5

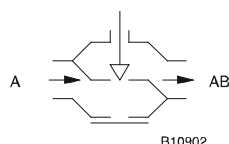
Valve: For F-variant, technical data and accessories see table of valve types.
 Actuator: For F-variant, technical data, accessories and fitting position, see table of valve types.
 Example: VUS 040 F305 / AVM 234S F132

Δp_{\max} [bar]=	Maximum admissible pressure difference over the valve at which the drive can still firmly open and close the valve while taking Δp_v into account.
Δp_s [bar]=	Maximum admissible pressure difference over the valve in the event of a malfunction (pipe break after the valve) at which the actuator can reliably close the valve by means of a return spring.
close/off pressure [bar]=	Maximum admissible pressure difference over the valve in control mode, at which the drive can still firmly open and close the valve. The serviceable life may be reduced. Cavitation, erosion and surges may damage the valve. The values apply only when the valve is fitted to the drive as a unit.
1)	Spring return or safety function (NO) with AVF234F132 or AVN224SF132

Operation

Using an electric 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. 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 PTFE 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 PTFE sealing.

Engineering and fitting notes

The valves are combined with either the AVM 234S actuators without spring return or the AVF 234S, actuator with spring return. The drive is slotted onto the valve and fixed with screws. The drive locks onto the valve spindle automatically. When the installation is put into service for the first time, the AVM 234S and the AVF 234S actuators extend and the coupling automatically makes the connection to the valve as soon as it reaches the lower valve seat. The valve stroke is also detected by the actuator; no further settings are necessary. The force acting on the seat is, therefore, always constant, ensuring the lowest possible amount of leakage. These actuators allow the characteristic to be changed from linear to quadratic or vice versa.

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 Δp_{\max} values. When used, 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%.

Other notes concerning hydraulics and noise in installations

The valves can be employed in a low-noise environment. To prevent noise, the Δp_{\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, the pressure difference should not exceed the value Δp_{crit} .

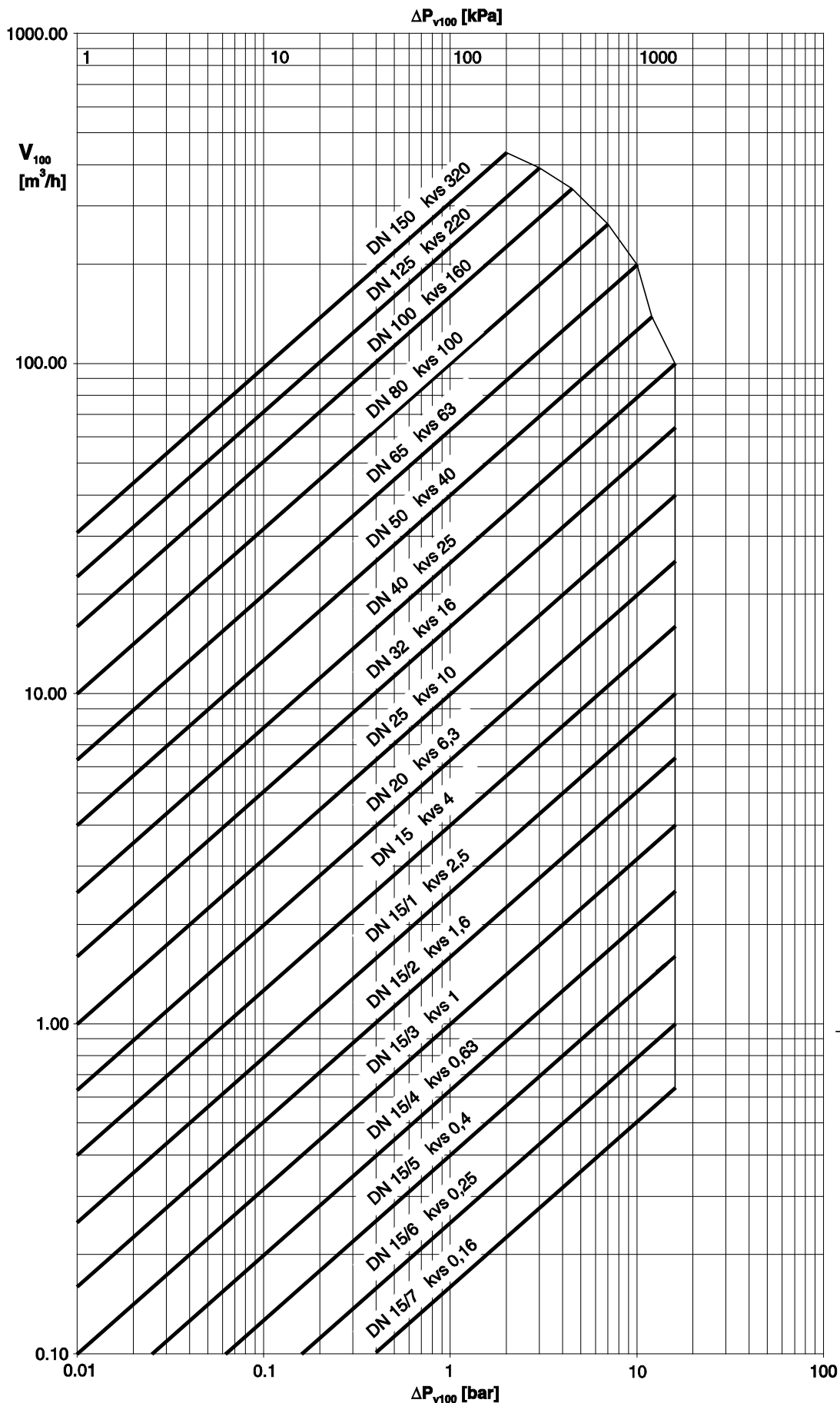
$$\Delta p_{\text{crit}} = (p_1 - p_v) \times 0,5$$

p_1 = Upstream pressure before the valve (bar) p_v = Steam pressure at operating temperature (bar)

Absolute pressure was used in these calculations.

The close/off pressure values are the maximal pressures at which the actuator can still move the valve with its own force. Please note that the valve may be damaged by cavitation and erosion if these pressures are used and the pressure difference Δp_{\max} is exceeded. As far as the spring-return function is concerned, the stated Δp_s values also represent the permissible differential pressure, up to which the actuator can still close the valve in the event of an emergency. Since this is a quick-close functions with fast stroke (by means of a spring), this value may exceed Δp_{\max} .

Flow-rate chart VUS



Δp_v gegen
den Druck
 Δp_v contre
la pression
 Δp_v against
the pressure

B10912a

Additional technical data

Type	Δp_v	
	Against the pressure	With the pressure
VUS015F375	40 bar	—
VUS015F365	40 bar	—
VUS015F355	40 bar	—
VUS015F345	40 bar	—
VUS015F335	40 bar	—
VUS015F325	40 bar	—
VUS015F315	40 bar	—
VUS015F305	40 bar	—
VUS020F305	40 bar	—
VUS025F305	40 bar	—
VUS032F305	40 bar	—
VUS040F305	30 bar	—
VUS050F305	20 bar	—
VUS065F305	8 bar	—
VUS080F305	4 bar	—
VUS100F305	1.5 bar	—
VUS125F305	1 bar	—
VUS150F305	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

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

VUS 15 to VUS 150

CE-0525 mark

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

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	X20Cr13
k_{vS} 0.16... k_{vS} 1.6	1.4571	X6CrNiMoTi1712-2
Spindle k_{vS} 2.5... k_{vS} 320	1.4021	X20Cr13
k_{vS} 0.16... k_{vS} 6	1.4571	X6CrNiMoTi1712-2
Plug k_{vS} 2.5... k_{vS}	1.4021	X20Cr13
k_{vS} 0.16... k_{vS} 1.6	1.4571	X6CrNiMoTi1712-2
Stuffing box	1.4021	X20Cr13
Seal underneath packing box	Cu	DIN 7603

Explanation of terms used

Δp_v

Maximum admissible pressure difference over 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 admissible pressure difference over 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 admissible pressure difference over 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 behind 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.

Close/off pressure:

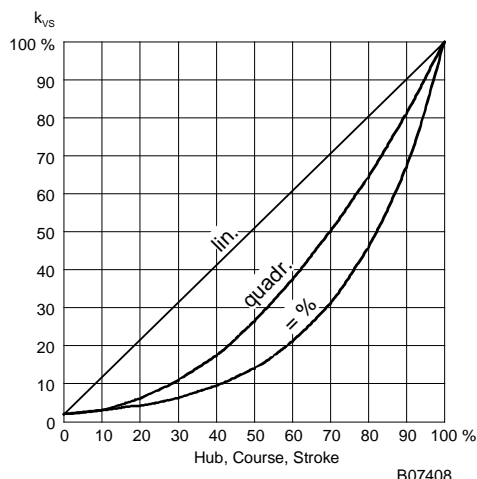
Maximum admissible pressure difference over the valve in control mode at which the actuator can still open and close the valve. A reduced service life should be expected in this mode. Cavitation, erosion and pressure surges may damage the valve. The values apply only when the valve is fitted to the actuator.

Characteristic for actuators with positioner (24 V only)

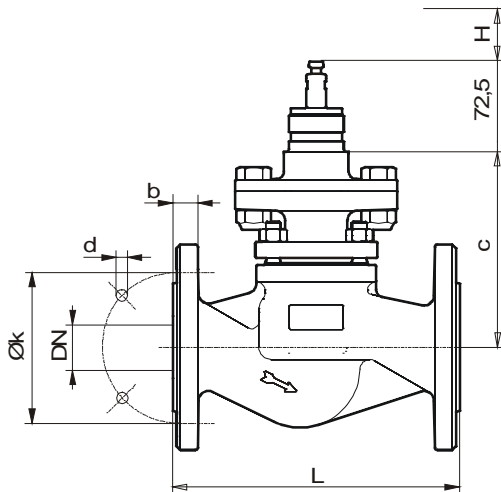
On the AVM 234S, AVF 234S actuator

Equal-percentage/linear/quadratic

settable using the coding switch



Dimension drawings

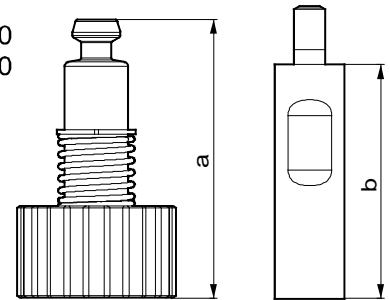


VUS	DN	c	L	H	k	d	b
015	15	135	130	20	65	14 x 4	16
020	20	135	150	20	75	14 x 4	18
025	25	143	160	20	85	14 x 4	18
032	32	143	180	20	100	19 x 4	18
040	40	150	200	20	110	19 x 4	18
050	50	156	230	20	125	19 x 4	20
065	65	169	290	30	145	19 x 8	22
080	80	184	310	30	160	19 x 8	24
100	100	203	350	30	190	23 x 8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

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Accessories

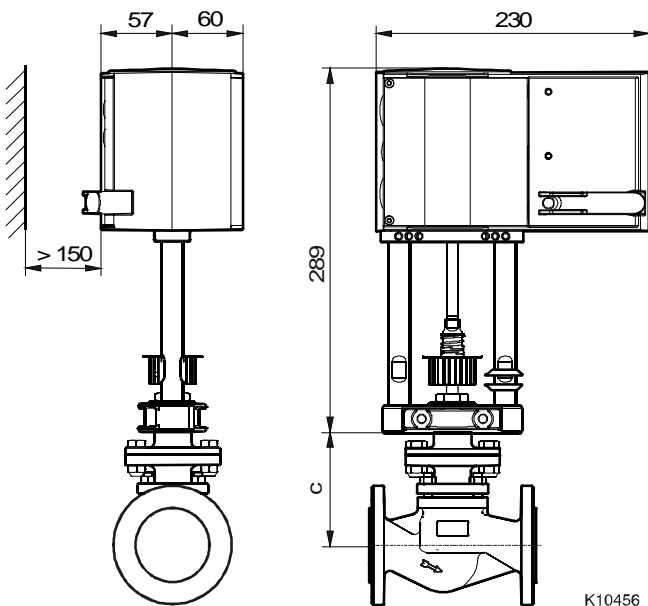
0372336 180
0372336 240



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

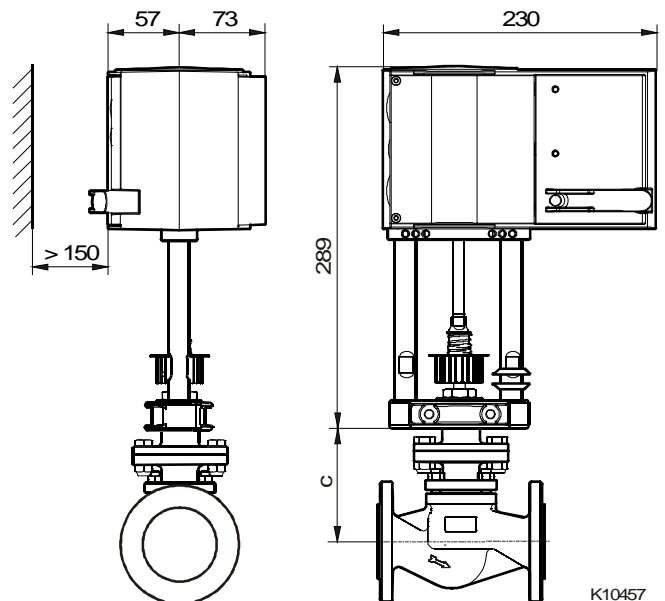
Z10219

AVM



K10456

AVF



K10457