

VUS: 2-way flanged valve, PN 40 (el.)

How energy efficiency is improved

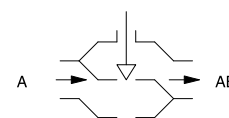
Efficiency means precise and reliable control

Features

- Continuous control of cold, warm and hot water in closed circuits, and of steam
- In combination with valve actuators AVM 322(S), AVM 234S and AVF 234S as control unit
- Water quality as per VDI 2035
- Not suitable for drinking water
- Valve with flange connection as per EN 1092-2, seal form B
- Regulating valve, free of silicone grease, matt black
- Equal-percentage characteristic, can be set with SUT valve actuators to linear or quadratic
- The valve is closed when the spindle is moved in. Closing procedure only against the pressure
- Valve body made of cast steel; spindle, seat and plug of stainless steel
- Maintenance-free stuffing box, made of stainless steel, with spring-loaded PTFE washer up to 220 °C, with graphite seal up to 260 °C



VUS040F305



Technical data

Parameters

Nominal pressure	PN 40
Operating pressure	40 bar at -10...50 °C 36.3 bar at 120 °C 29.4 bar at 220 °C 27.8 bar at 260 °C
Connection	Flange as per EN 1092-2, form B
Valve characteristic	Equal-percentage
Control ratio	> 50: 1
Leakage rate	≤ 0.05% of K_{VS} value

Ambient conditions

Operating temperature ¹⁾	-10...260 °C
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CE/UKCA conformity²⁾

Pressure and temperature data	EN 764, EN 1333
Flow parameters	EN 60534
PED 2014/68/EU (CE)	VdTÜV pressure information sheet 100, sheet 1, cat. IV EN 12952-11, EN 12953-9
PESR-2016 (UKCA)	Article 4.3 AD 2000 Rulebook

Overview of types

Type	Nominal diameter	K_{VS} value	Valve stroke	Weight
VUS015F375	DN 15	0.16 m³/h	20 mm	5.1 kg
VUS015F365	DN 15	0.25 m³/h	20 mm	5.1 kg
VUS015F355	DN 15	0.4 m³/h	20 mm	5.1 kg
VUS015F345	DN 15	0.63 m³/h	20 mm	5.1 kg
VUS015F335	DN 15	1 m³/h	20 mm	5.1 kg
VUS015F325	DN 15	1.6 m³/h	20 mm	5.1 kg
VUS015F315	DN 15	2.5 m³/h	20 mm	5.1 kg
VUS015F305	DN 15	4 m³/h	20 mm	5.1 kg
VUS020F305	DN 20	6.3 m³/h	20 mm	5.9 kg
VUS025F305	DN 25	10 m³/h	20 mm	6.8 kg
VUS032F305	DN 32	16 m³/h	20 mm	8.4 kg
VUS040F305	DN 40	25 m³/h	20 mm	10.6 kg

¹⁾ No stuffing box heater required down to -10 °C. Above 130 °C or 180 °C, use the relevant adapter (accessory). Above 200 °C and up to 260 °C, use stuffing box with graphite seal (accessory)

²⁾ Explanation of abbreviations in the "Further information" section of the product data sheet and in the appendix to SAUTER's product catalogues



ValveDim app



Type	Nominal diameter	K _{vs} value	Valve stroke	Weight
VUS050F305	DN 50	40 m³/h	20 mm	13.2 kg
VUS065F305	DN 65	63 m³/h	30 mm	18.6 kg
VUS080F305	DN 80	100 m³/h	30 mm	25.1 kg
VUS100F305	DN 100	160 m³/h	30 mm	36.4 kg

CE/UKCA conformity

	EU		UK	
	PED 2014/68/EU	Label	PESR-2016 (UKCA)	Label
VUS015F375	Art. 4.3	Without CE	Art. 8.3	Without UKCA
VUS015F365				
VUS015F355				
VUS015F345				
VUS015F335				
VUS015F325				
VUS015F315				
VUS015F305				
VUS020F305				
VUS025F305				
VUS032F305				
VUS040F305	Category I	CE	Category I	UKCA
VUS050F305				
VUS065F305				
VUS080F305				
VUS100F305				

Accessories

Type	Description
0372336180	Adaptor (required when temperature of the medium is 130...180 °C)
0372336240	Adaptor (required when temperature of the medium is 180...260 °C)
0378373001	Stuffing box with graphite seal for temperatures of 220...260 °C; DN 15...50
0378373002	Stuffing box with graphite seal for temperatures of 220...260 °C; DN 65...100

Combination of VUS with electric actuators

- i Warranty:** The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators. The warranty does not apply if used with valve actuators from other manufacturers.
- i Definition of Δp_s :** Maximum admissible pressure drop in the event of a malfunction (pipe break after the valve) at which the actuator reliably closes the valve by means of a return spring.
- i Definition of Δp_{max} :** Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the valve.

Pressure differences

Actuator	AVM322F120 AVM322F122	AVM322SF132	AVM234SF132	AVF234SF132 AVF234SF232		
Actuating power	1000 N	1000 N	2500 N	2000 N		
Control signal	2-/3-point	2-/3-point, 0...10 V, 4...20 mA	2-/3-point, 0...10 V, 4...20 mA	2-/3-point, 0...10 V, 4...20 mA		
Running time for DN 15...50	120/240 s	80/120 s	40/80/120 s	40/80/120 s		
Running time for DN 65...100	–	–	60/120/180 s	60/120/180 s		
Closes against the pressure	Δp_{max} [bar]	Δp_{max} [bar]	Δp_{max} [bar]	Δp_{max} [bar]	Δp_s [bar]	
VUS015F375 VUS015F365 VUS015F355 VUS015F345 VUS015F335 VUS015F325 VUS015F315 VUS015F305 VUS020F305	35.0	35.0	40.0	40.0	25.0	
VUS025F305	17.4	17.4	37.8	29.6	25.0	
VUS032F305	12.2	12.2	28.7	22.5	21.0	
VUS040F305	6.2	6.2	16.4	12.8	13.5	
VUS050F305	3.7	3.7	10.5	8.2	8.5	
VUS065F305	–	–	6.1	4.7	5.6	
VUS080F305	–	–	3.9	3.0	3.4	
VUS100F305	–	–	1.5	1.5	2.2	

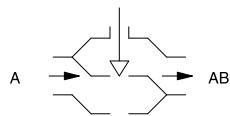
Cannot be used to close with the pressure

💡 At temperatures above 130 °C, accessories are required

Description of operation

The valve can be moved to any intermediate position with an electric actuator. When the spindle is pressed in, the control passage of the valve is closed. These valves may only be used when closing “against the pressure”. Observe the direction of flow shown on the valve. The flow parameters comply with EN 60534.

Closing procedure against the pressure



These regulating valves are characterised by their reliability and precision and make an important contribution towards efficient regulation. They meet difficult challenges such as spring-controlled closing functions, overcoming high differential pressures, controlling media temperatures and performing the shut-off function, all with a low noise level.

The spindle is automatically and firmly connected to the actuator spindle. The stainless steel plug controls the equal-percentage flow rate in the control passage. The tightness of the valve is ensured by the stainless steel ring pressed in the seat and the corresponding valve plug.

The stuffing box is maintenance-free. This consists of tapered PTFE rings and a spring. The spring ensures permanent tension on the seals, thus guaranteeing that they are leaktight against the

spindle. In addition, a grease reserve ensures that the spindle is constantly lubricated. The grease reserve also stops any particles that are present in the medium from penetrating to the PTFE sealing.

Intended use

This product is only allowed to be used in HVAC building systems for control and regulation purposes. Other uses require the prior consent of the manufacturer.

The section "Description of operation" and all product instructions in this data sheet must be observed.

Modifying or converting the product is not permitted.

Improper use

The product is not suitable for:

- Safety applications
- Drinking water installations

Engineering and fitting notes

The valves are combined with the AVM 322(S) or AVM 234S valve actuators without a spring return or with the AVF 234S valve actuator with a spring return. The actuator is mounted directly on the valve and fastened with screws. The actuator is connected with the spindle automatically. During the commissioning of the system, the AVM 322(S), AVM 234S and AVF 234S actuators move out. The connector automatically closes the connection to the valve as soon as it reaches the lower valve seat. The stroke of the valve is also detected by the actuator, and no further adjustments are required. Therefore the force on the seat is always the same and leakage levels are always minimised. With the SUT actuators, the characteristic can be set to linear or quadratic as required.

When the actuator is mounted on the valve, make sure the plug is not twisted on the stainless steel seat (this can damage the sealing surface). When insulating the valve, it may only be insulated up to the connecting clip of the actuator.

Using with water

So that impurities are retained in the water (weld beads, rust particles, etc.) and the spindle seal is not damaged, we recommend installing collecting filters, for example one for each floor or pipe run. Requirements for water quality as per VDI 2035.

When using an additive in the water, the compatibility of the valve materials must be checked with the manufacturer of the medium. The materials table shown below may be used. When glycol is used, the recommended concentration is between 20% and 55%.

Using with steam

The valves can be used for steam applications up to 200 °C with the same Δp_{\max} values as listed in the combination tables. When using the valve, make sure that it does not operate mainly on the lower third of its stroke range. This position leads to an extremely high flow speed, which greatly reduces the serviceable life of the valve.

Fitting position

The control unit can be mounted in any position up to a media temperature of 130 °C, but suspended mounting is not recommended. At temperatures of over 130 °C or over 180 °C, a horizontal fitting position is recommended, and the appropriate adapter for the temperature must be used. The adapter can also be used as an extension to come out of the pipe insulation with the actuator. To protect the valve actuator from excessive heat, the piping must be insulated.

Condensate, drops of water, etc. must be prevented from entering the actuator. With horizontal installation and no structural support for the actuator, the maximum admissible weight on the valve is 25 kg.

Outdoor installation

We recommend protecting the devices from the weather if they are installed outside buildings.

Hydraulics and noise in plants

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

The pressure difference Δp_v is the maximum pressure that may act on the valve regardless of the stroke position, in order that the risk of cavitation and erosion is limited. These values are irrespective of the actuator force. The cavitation accelerates wear on the plug and seat in the valve and causes noises. To prevent cavitation, which mainly occurs in applications with water or steam, the differential pressure Δp_{\max} 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 = pressure at operating temperature (bar)

The calculation works with absolute pressure.

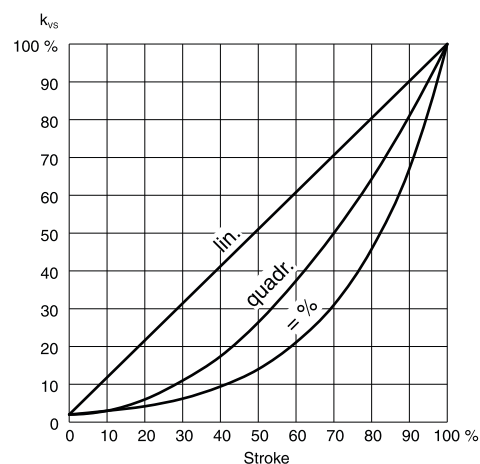
For the spring return, the stated Δp_s values are also the permissible differential pressure up to which the actuator can guarantee that the valve is closed in the event of an incident. Because this is an emergency function with a fast stroke movement (using a spring), this value can exceed Δp_{\max} .

Characteristic for actuators with positioner (24 V only)

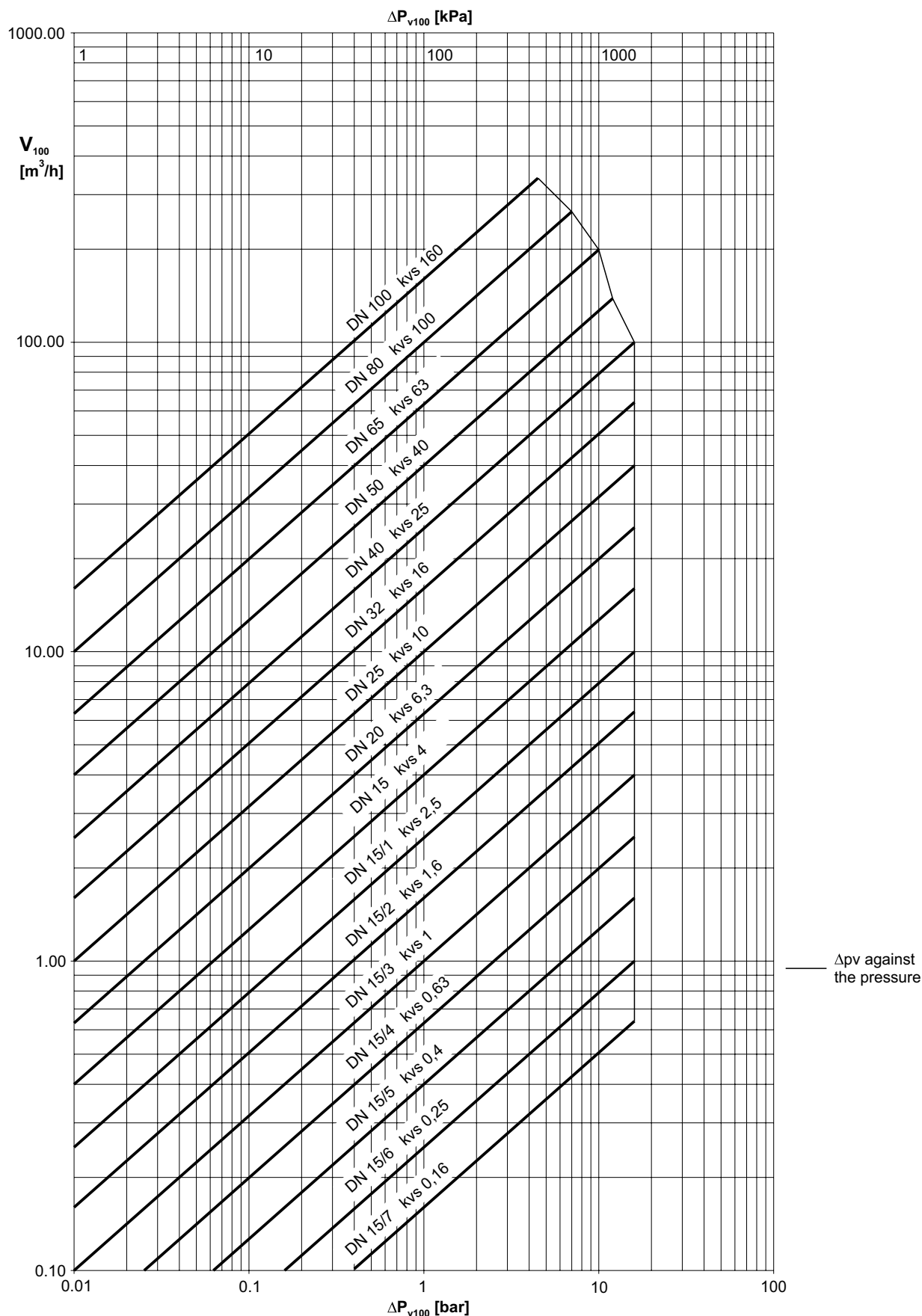
On actuator AVM 322(S), AVM 234S or AVF 234S

Equal-percentage/linear/quadratic

Can be set using coding switch



Flow-rate chart



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

 Cannot be used "with the pressure"

Additional information

	Document no.
Fitting instructions for VUS/BUS	MV 506071
Fitting instructions for AVM 322	P100011900
Fitting instructions for AVM 234S	MV 505919
Fitting instructions for AVF 234S	MV 505920
SAUTER slide rule for valve sizing	P100013496
Manual for SAUTER slide rule	7000129001
Declaration on materials and the environment	MD 56.125

Abbreviations used

CE	Manufacturer's Declaration of Conformity for the European Union (EU)
PED	Pressure Equipment Directive 2014/68/EU
PESR-2016	Pressure Equipment (Safety) Regulations 2016 (UK)
UKCA	Manufacturer's Declaration of Conformity for the United Kingdom of Great Britain and Northern Ireland (UK)

Valve design



SAUTER provides various tools for valve design and engineering:

- ValveDim smartphone app
- ValveDim PC program
- ValveDim slide rule

You can find the tools under the link www.sauter-controls.com/en/performance/valve-calculation/ or scan the QR code



Design and materials

Valve body made 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, seal form B. Valve body protected by matt paint RAL 9005 black. Recommended for the welding flanges as per EN 1092-1. Valve fitting length as per EN 558-1, basic series 1. Flat seal on valve body made of asbestos-free material.

PTFE collar and sealing ring for stuffing box available as spare part no. 0378372

Material numbers as per DIN

	DIN material no.	DIN designation
Valve body	1.0619+N	GP240GH+N
Valve seat k_{VS} 2.5. K_{VS} 160	1.4021	X20Cr13
Valve seat k_{VS} 0.16.. K_{VS} 1.6	1.4571	X6CrNiMoTi1712-2
Spindle k_{VS} 2.5.. K_{VS} 160	1.4021	X20Cr13
Spindle k_{VS} 0.16.. K_{VS} 1.6	1.4571	X6CrNiMoTi1712-2
Plug k_{VS} 2.5.. K_{VS} 160	1.4021	X20Cr13
Plug k_{VS} 0.16.. K_{VS} 1.6	1.4571	X6CrNiMoTi1712-2
Stuffing box	1.4021	X20Cr13
Seal under stuffing box	Cu	DIN 7603

Definition of pressure differences

- Δp_v :** Maximum admissible pressure difference over the valve at every stroke position, limited by noise level and erosion. With this parameter, the valve is characterised as a flow element with specific hydraulic behaviour. Monitoring the cavitation and erosion along with the associated noise increases both the service life and the operational capacity.
- Δp_{max} :** Maximum admissible pressure difference over the valve at which the actuator can reliably open and close the valve. The following are considered: Static pressure and flow effects. This value ensures trouble-free stroke movement and tightness. The value Δp_v of the valve is never exceeded.
- Δp_s :** Maximum admissible pressure difference over the valve in the event of a malfunction (e.g. power failure, excessive temperature or pressure, pipe break) at which the actuator can close the valve tightly and, if necessary, maintain the entire operating pressure against atmospheric pressure. Because this is a safety function with a rapid stroke movement, Δp_s can be greater than Δp_{max} or Δp_v . The flow disturbing effects that arise here are quickly passed through. They are of secondary importance with this method of operation. For 3-way valves, the values only apply to the control passage.
- Δp_{stat} :** Line pressure behind the valve. This essentially corresponds to the idle pressure when the pump is switched off, caused for example by the fluid level in the system, increased pressure due to pressure tanks or steam pressure. For valves that close with pressure, the static pressure plus the pump pressure are used.

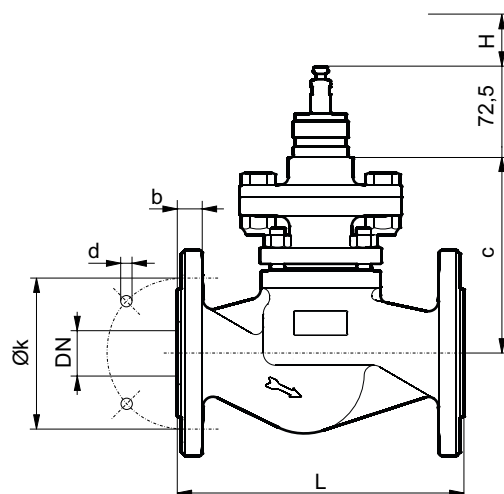
Disposal

When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.

Dimension drawings

All dimensions in mm.

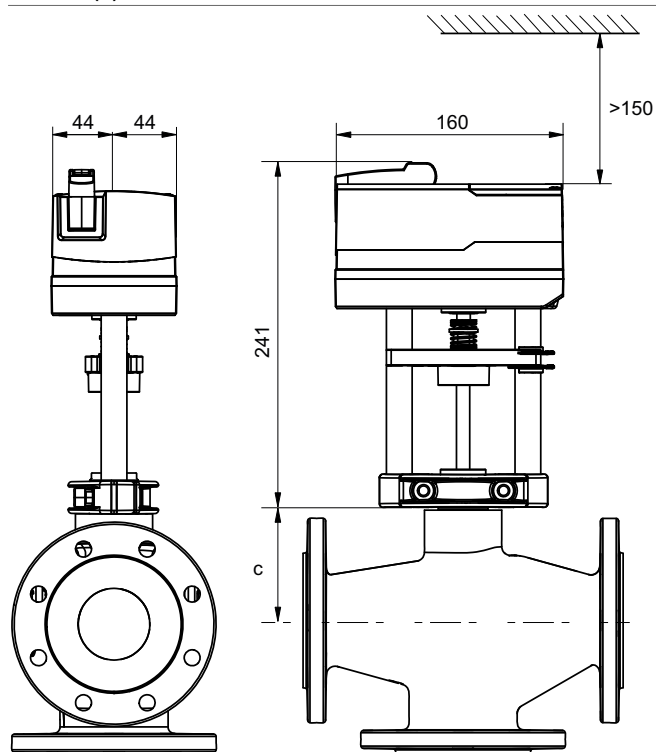


DN	c (mm)	L (mm)	H (mm)	k (mm)	d (mm)	b (mm)
15	135	130	20	65	14 × 4	16
20	135	150	20	75	14 × 4	18
25	143	160	20	85	14 × 4	18
32	143	180	20	100	19 × 4	18
40	150	200	20	110	19 × 4	18
50	156	230	20	125	19 × 4	20
65	169	290	30	145	19 × 8	22
80	184	310	30	160	19 × 8	24
100	203	350	30	190	23 × 8	24

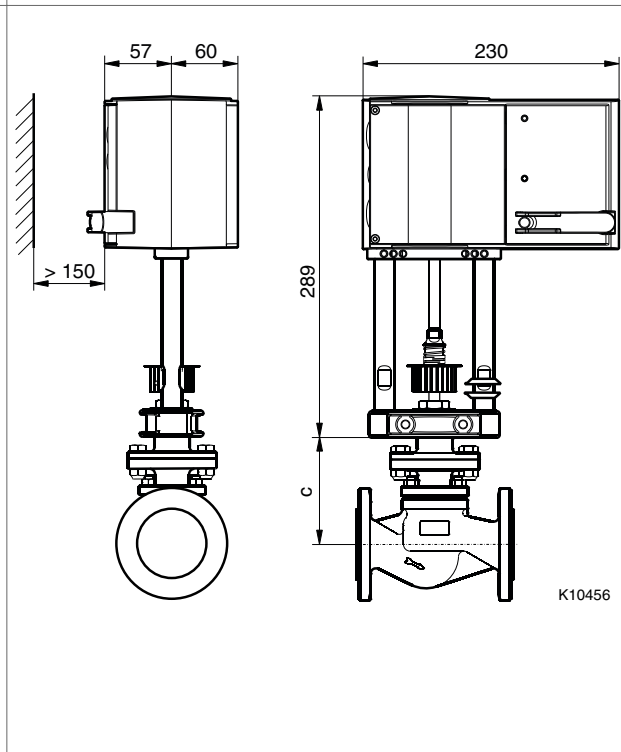
Combinations

i For dimension c, see table above.

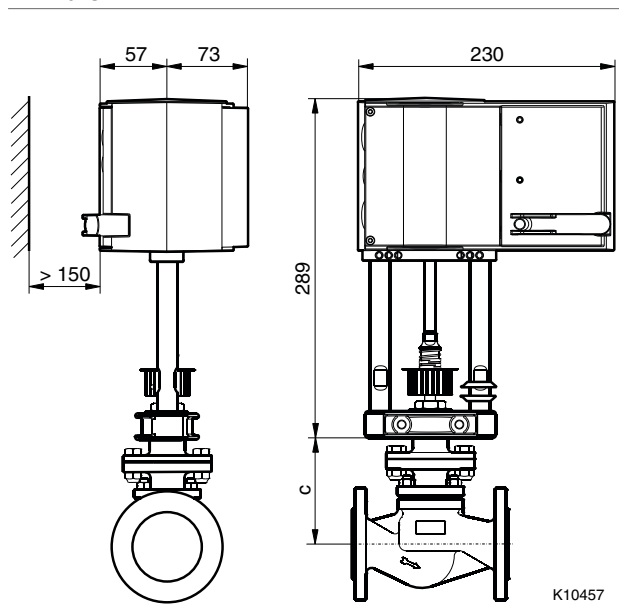
AVM 322(S)



AVM 234S

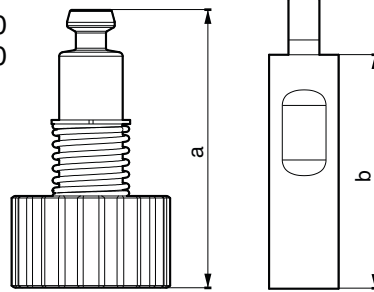


AVF 234S



Accessories

0372336 180
0372336 240



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