BUD: Flanged three-way valves, PN 6

How energy efficiency is improved

Precision control with high level of reliability means efficiency.

Areas of application

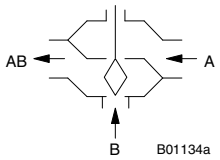
Continuous control of cold and hot water and air in closed networks 1) and flow temperature in heating systems. Water quality as per VDI 2035. Together with actuators AVM 105, AVM 115, AVM 124/125, AVF 124/125, AVM 234S, AVF 234S and AVN 224S as regulating unit.

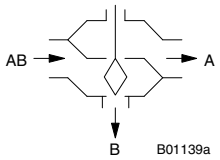
Features

- Nominal pressure 6 bar
- Control valve, contains no silicone grease; painted black
- Nominal diameters DN15 to DN100
- Equal percentage characteristic, adjustable with SUT actuators to linear or quadratic
- Linear mixing passage characteristic
- With the spindle retracted, the valve is closed
- Can be used as control valve or diverting valve

Technical description

- Valve with flange connection as per EN 1092-2, Form B, raised face
- Valve body and seat made of cast iron
- Stainless steel spindle
- Nominal diameter DN15 to DN50 cones in brass with glass-fibre reinforced PTFE sealing ring
- Cone nominal diameter DN65 to DN100 in brass, metal-to-metal seal
- Stuffing box made of brass with wiper ring and double O-ring seal in EPDM





Type	Nominal diameter DN	Connection PN	k_{VS} value m^3/h	Weight kg
BUD 015 F320	15	6	1.6	3.2
BUD 015 F310	15	6	2.5	3.2
BUD 015 F300	15	6	4.0	3.2
BUD 020 F300	20	6	6.3	4.1
BUD 025 F300	25	6	10	4.7
BUD 032 F300	32	6	16	7.1
BUD 040 F300	40	6	22	8.4
BUD 050 F300	50	6	28	10.9
BUD 050 F200	50	6	40	11.2
BUD 065 F300	65	6	49	11.9
BUD 065 F200	65	6	63	11.9
BUD 080 F300	80	6	78	17.7
BUD 080 F200	80	6	100	17.7
BUD 100 F300	100	6	124	26.0
BUD 100 F200	100	6	160	26.0

Operating temperature		-10....150 °C 2)
Operating pressure		6 bar
Valve characteristic for		
control passage	F200	linear
	F300	equal-percentage
mixing passage		linear
Valve control ratio		> 50:1
Stuffing box		2 O-rings, EPDM
Leakage rate for		
control passage		≤ 0.05% of k_{vs} value
mixing passage		≤ 1% of k_{vs} value
Valve stroke DN 15....50		8 mm
Valve stroke DN 65....80		20 mm
Valve stroke DN 100		40 mm

Dimension drawing	
DN 15....50	M10470
DN 65....100	M10440
Fitting instructions	
DN 15....50	MV 506008
DN 65...100	MV 505964
AVM 104S, 114S	MV 505790
AVM 105, 115, 105S, 115S	MV 506065
AVM 124, 124S	MV 505809
AVM 125S	MV 506066
AVF 124, 124S	MV 505851
AVF 125S	MV 506067
AVM 234 S assembly	MV 505919
AVF 234 S assembly	MV 505920
Material declaration	MD 56.111

1) Air humidity must not exceed 75%
2) At temperatures below 0 °C, use the stuffing box heater; at temperatures above 100 °C, use the temperature adaptor (accessory).

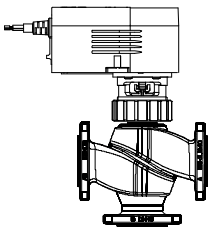
Accessories

0372240 001*	Manual adjuster for valves with stroke of 8 mm; MV505813
0372249 001*	Intermediate piece required for media temperature >100 °C up to max. 130 °C (recommended for temperature < 10 °C), for AVM, DN 15....50, MV505932
0372249 002*	Intermediate piece required for media temperature >130 °C up to max. 150 °C for AVM, DN 15....50, MV505932
0372336 180	Intermediate piece required for media temperature >130 °C / <150 °C from DN 65 MV505902
0378284 100*	Stuffing box heater, 230 V~; 15 W, for media below 0 °C, DN 15....100, MV505978
0378284 102*	Stuffing box heater, 24 V~; 15 W, for media below 0 °C, DN 15....100, MV505978
0378368 001	Complete replacement stuffing box for DN 15 to DN 50
0378369 001	Complete replacement stuffing box for DN 65 to DN 100

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

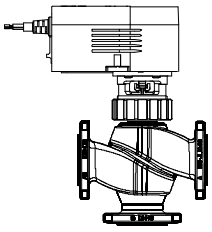
Warranty — The technical data and pressure differences indicated here are only applicable in combination with Sauter valve drives. Any warranty shall lapse if valve drives from other manufacturers are used.

Combination: BUD with electric drive, pushing force 250 N


B10668

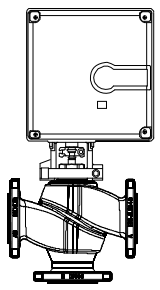
Drive Input: Running time:	**> 100 °C accessories required**			**AVM 105 F12.** **2-/3-point** **120 s**	**AVM 105 F100** **2-/3-point** **30 s**	**AVM 105S** **2-/3-point, 0...10 V** **35 / 60 / 120 s**
Valve	Used as control valve					
	Δp_{max}	**Δp_s**	**close/off pressure**			
BUD 015	4	–	6			
BUD 020	4	–	4.3			
BUD 025	2.8	–	2.8			
BUD 032	2.1	–	2.1			
BUD 040	1.2	–	1.2			
BUD 050	0.9	–	0.9			

Combination: BUD with electric drive, pushing force 500 N


B10668

Drive Input: Running time:	**> 100 °C accessories required**			**AVM 115 F12.** **2-/3-point** **120 s**	**AVM 115S** **2-/3-point, 0...10 V** **60 / 120 s**
Valve	Used as control valve				
	Δp_{max}	**Δp_s**	**close/off pressure**		
BUD 015	6	–	6		
BUD 020	6	–	6		
BUD 025	6	–	6		
BUD 032	5.2	–	5.2		
BUD 040	3.3	–	3.3		
BUD 050	2	–	2		

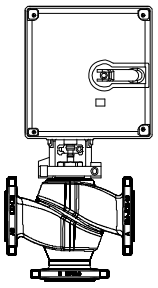
Combination: BUD with electric drive, pushing force 800 N


B10670

Drive Input: Running time:	**> 100 °C accessories required**						**AVM 124** **2-/3-point** **120 s**	**AVM 125S** **2-/3-point, 0...10 V** **30 / 60 / 120 s**
Valve	Application as control valve			as diverting valve				
	Δp_{max}	**Δp_s**	**close/off pressure**	**Δp_{max}**	**Δp_s**	**close/off pressure**		
BUD 015	6	–	6	6	–	6		
BUD 020	6	–	6	6	–	6		
BUD 025	6	–	6	5	–	6		
BUD 032	6	–	6	4	–	6		
BUD 040	5.7	–	5.7	2.5	–	5.3		
BUD 050	3.4	–	3.4	1.5	–	3.2		

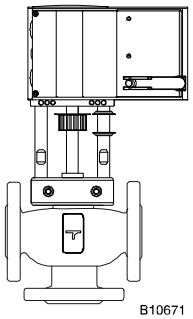
Combination: BUD with electric drive, with spring return, pushing force 500 N

Drive Input: Running time: Spring return:	**> 100 °C accessories required**						**AVF 124** **3-point** **60 / 120 s** **18 ± 10 s**	**AVF 125S** **2-/3-point, 0....10 V** **60 / 120 s** **18 ± 10 s**
Valve	Application as control valve			as diverting valve			Application	
	Δp_{max}	**Δp_s**	**close/off pressure**	**Δp_{max}**	**Δp_s**	**close/off pressure**		
BUD 015	6	6	6	6	6	6		
BUD 020	6	6	6	6	6	6		
BUD 025	6	6	6	5	6	6		
BUD 032	5.2	5.2	5.2	4	6	5.1		
BUD 040	3.3	3.3	3.3	2.5	6	3.1		
BUD 050	2.0	2.0	2.0	1.5	6	1.9		


B10669

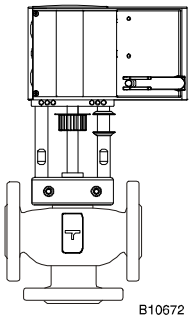
Combination: BUD with electric drive, pushing force 2500 N

Drive Input: Running time DN 65 / 80: Running time DN 100:	**AVM 234S F132** **2-/3-pt.; 0...10 V / 4...20 mA; 24 V; with accessories 3-pt. 230 V** **40 / 80 / 120 s** **80 / 160 / 240 s**						**> 130 °C accessories required**
Valve	Application as control valve			as diverting valve			
	Δp_{max}	**Δp_s**	**close/off pressure**	**Δp_{max}**	**Δp_s**	**close/off pressure**	
BUD 065	3	–	6	1	–	6	
BUD 080	3	–	4.4	0.75	–	4.6	
BUD 100	2	–	2.8	0.5	–	2.9	


B10671

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

Drive Input: Running time DN 65 / 80: Running time DN 100: Spring return:	**AVF 234S F132, F232** **2-/3-pt.; 0...10 V / 4...20 mA; 24 V; with accessories 3-pt. 230 V** **40 / 80 / 120 s** **80 / 160 / 240 s** **15 - 30 s, with F132 NC, with F232 NO**						**> 130 °C accessories required**
Valve	Application as control valve			as control valve			
	Δp_{max}	**Δp_s**	**close/off pressure**	**Δp_{max}**	**Δp_s**	**close/off pressure**	
BUD 065	3	5.1	5.1	1	6	5.4	
BUD 080	3	3.4	3.4	0.75	6	3.6	
BUD 100	2	2.2	2.2	0.5	6	2.3	


B10672

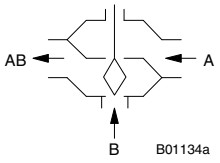
Valve: Variant F, for technical data and accessories see Valve Type Table
Drive: Variant F, for technical data, accessories and installation position see section 51
Example: BUD 065 F300 / AVM 234 S F132

Δp_{max} [bar]=	Maximum permitted pressure difference across 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 across 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.
1)	Spring return NO with AVF234F232

Function

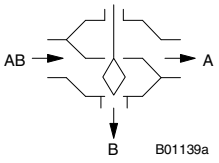
The valve can be controlled into any desired intermediate position by means of an electric drive. If the valve stem is extended, the control passage of the valve is closed. These valves may be used as control valves as well as diverting valves. The direction of flow marked on the valve must be observed. Parameters related to flow mechanics conform to EN 60534.

Used as a control valve



B01134a

Used as a diverting valve



B01139a

Description
The key features of these control valves are their high reliability and precision, and they make a major contribution towards environment-friendly control. They meet demanding requirements including quick-close functions, coping with differential pressures, controlling the medium temperature and providing a shut-off function - and all this is achieved with a low noise level.
An automatic and fixed connection is made between the valve stem and the drive shaft. The cone (which is made of brass) controls an equal-percentage flow in the control passage. To compensate for the complementary characteristic of the consumer and to guarantee an identical quantity of medium regardless of the valve position, the mixing passage acts with a linear characteristic. The tightness of this valve is guaranteed by the seat which is machined in the body.
The stuffing box is maintenance-free; it consists of a brass body, 2 O-rings, a wiper ring and the grease reserve. This is free of silicone grease and no silicone oil must be used for the stem.

Engineering and fitting notes
The valves are combined with valve drives without spring return action, or valve drives with spring return action. The drive is placed directly on top of the valve and is fixed either with a nut or 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 closes automatically once it has reached the lower valve seat. The valve stroke is also detected by the drive and no further adjustments are required. This means that the force on the seat is always equal and the lowest leakage rate is always guaranteed. With the SUT drives, the characteristic can be changed over to linear or quadratic as desired. For the combination AVM 105S with DN50 F200 it is not possible to change the character from linear to equal-percentage.

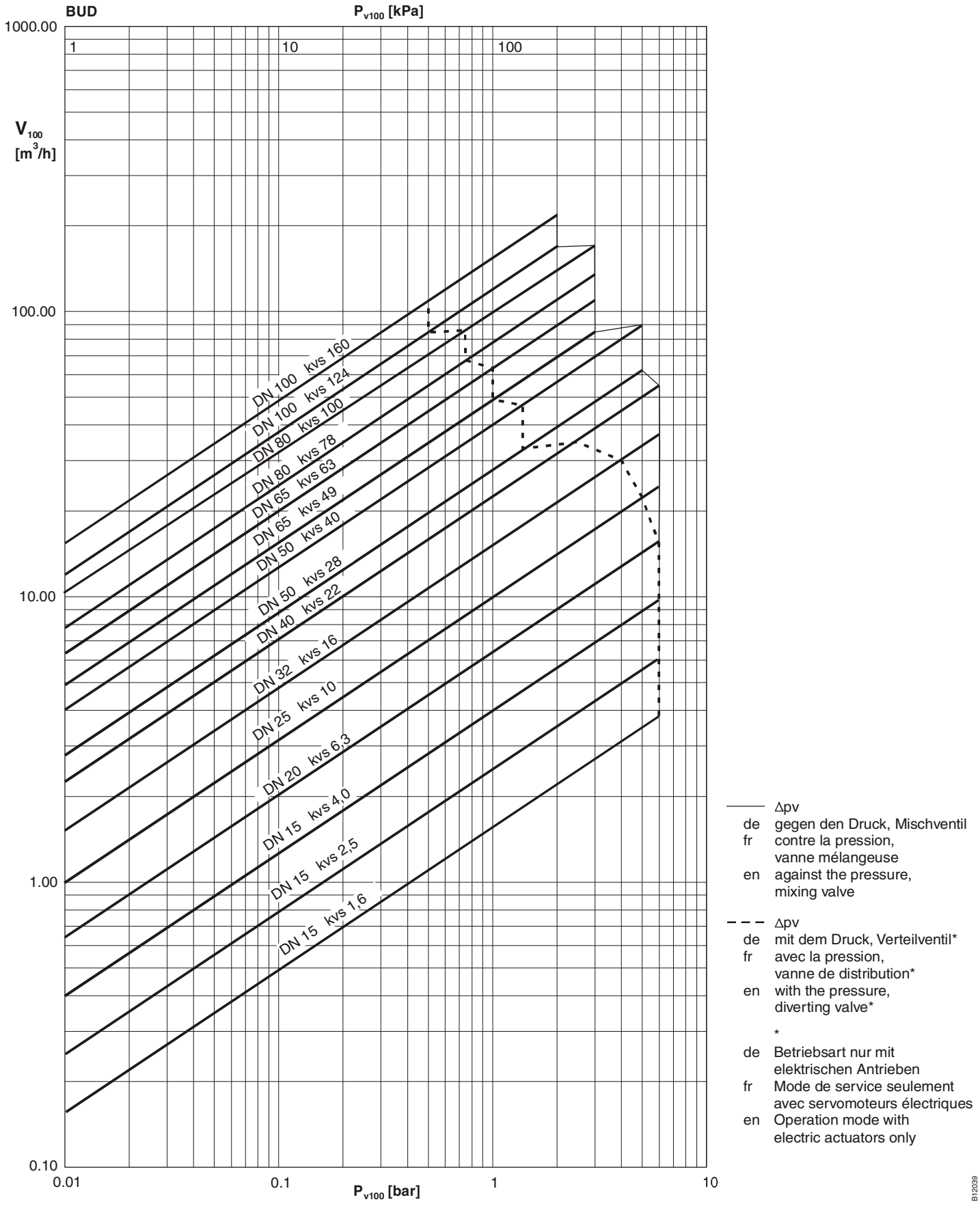
Installation position
The final control element can be installed in any desired position, but an installed position facing downwards is not recommended. Condensate and water drips etc. must be prevented from penetrating into the drive. With nominal diameters DN 65 to DN 100 in a horizontal installed position and in relation to the valve stem, the permitted maximum drive (or other) weight is 25 kg unless a support is provided by the customer or others.
When fitting the drive onto the valve, you must make sure that the cone is not rotated on the 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 must not be used for applications involving steam.

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 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 in zones where there is a risk of explosion.

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.
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 quick-close function with 'fast' passage through the stroke (by means of the spring), this value may exceed Δp_{max}.

Pressure loss table



Type	Δpv	
	Used as a control valve	Used as a diverting valve
BUD 015 F…	6	6
BUD 020 F300	6	6
BUD 025 F300	6	5
BUD 032 F300	6	4
BUD 040 F300	6	2,5
BUD 050 F…	5	1,5
BUD 065 F…	3	1,0
BUD 080 F…	3	0,75
BUD 100 F…	2	0,5

Additional technical data

□ Pressure and temperature data	EN 764. EN 1333
□ Parameters related to flow mechanics	EN 60534 page 3
□ Sauter slide rule for valve sizing	7 090011 003
□ Manual for slide rule	7 000129 003
□ Technical manual: 'Regulating Units'	7 000477 003
□ Parameters, installation notes, control, general	Valid EN, DIN, AD, TRD and UVV specifications/regulations
□ CE conformity, Pressure Equipment Directive (fluid group II)	97/23/EC
□ BUD 015 to BUD 100: no CE symbol	Article 3.3

Additional information

Valve body made of grey cast iron to EN 1561, code EN-GJL-250, material number EN-JL 1040 with smooth drilled flanges to EN 1092-2, form B, sealing strip. Valve body protected by matt paint to RAL 9005, dark black. Recommendation for 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.

DIN material numbers

	DIN material number	DIN designation
Valve body	EN-JL 1040	EN-GJL-250 (GG25)
Valve seat	EN-JL 1040	EN-GJL-250
Stem	1.4305	X 8 Cr Ni S 18-9
Cone	CW 617 W	CuZn40Pb2
Conical seal	PTFE	
Stuffing box	CW 617 W	CuZn40Pb2

Detailed information on pressure difference definitions

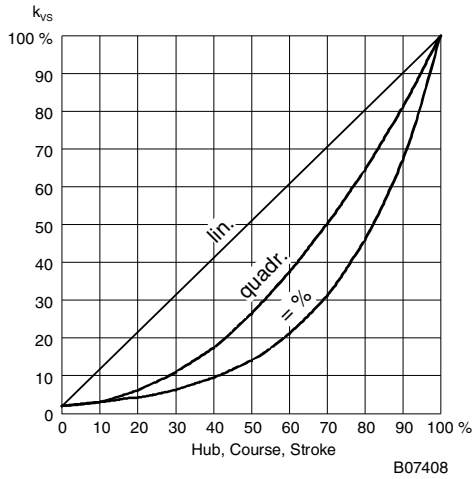
Δp_v:
Maximum permitted pressure difference across the valve for every position of the stroke, limited by noise level and erosion.
This parameter specifically characterises the hydraulic behaviour of the valve as an element through which a flow passes. Monitoring of cavitation and erosion, and the associated development of noise, will improve the valve's lifetime as well as its usability.

Δp_{max}:
Maximum permitted pressure difference across 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 across 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 quick-close 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.
For valves which close with the pressure, the static pressure added to the pump pressure must be used for this purpose.

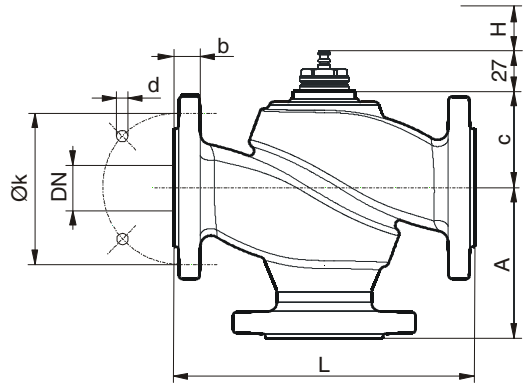
Characteristic for drives with a positioner
On drive AVM 105S or AVM 115S
Equal-percentage / linear
On drives AVM 125S, AVF 125S, AVM 234S or AVF 234S
Equal-percentage / linear / quadratic



Can be set using coding switch

Dimension drawings

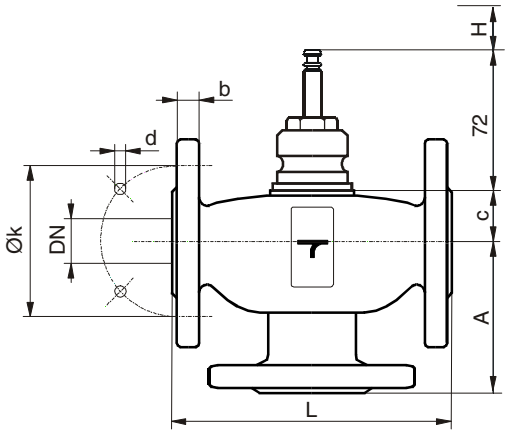
DN 15…50



VUD, BUD	DN	A	c	L	H	k	d	b
015	15	70	41,5	130	8	55	11 x 4	14
020	20	75	48	150	8	65	11 x 4	16
025	25	80	54,5	160	8	75	11 x 4	16
032	32	95	60,5	180	8	90	14 x 4	18
040	40	100	70,5	200	8	100	14 x 4	18
050	50	115	71	230	8	110	14 x 4	20

M10470

DN65…100

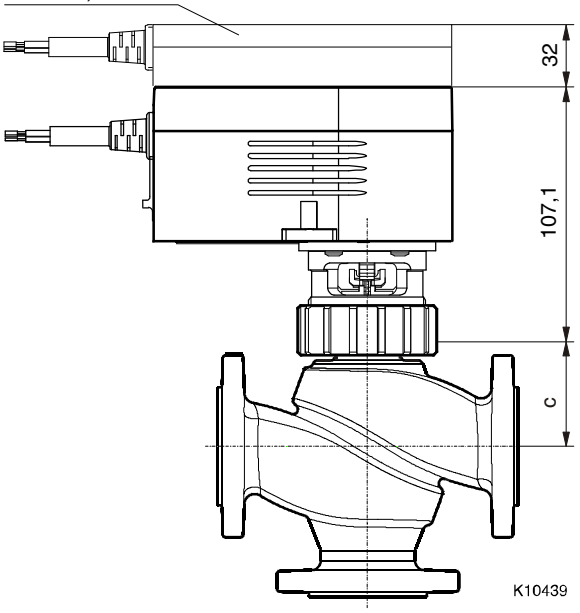


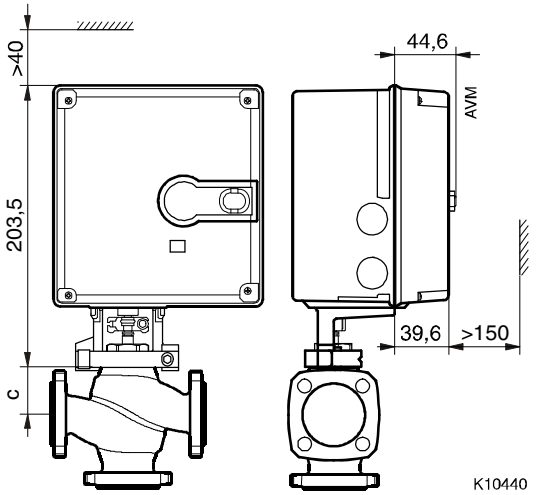
BUD	DN	A	c	L	H	k	d	b
065	65	120	62	240	20	130	14 x 4	16
080	80	130	62	260	20	150	19 x 4	18
100	100	150	93	300	40	170	19 x 4	18

M10440b

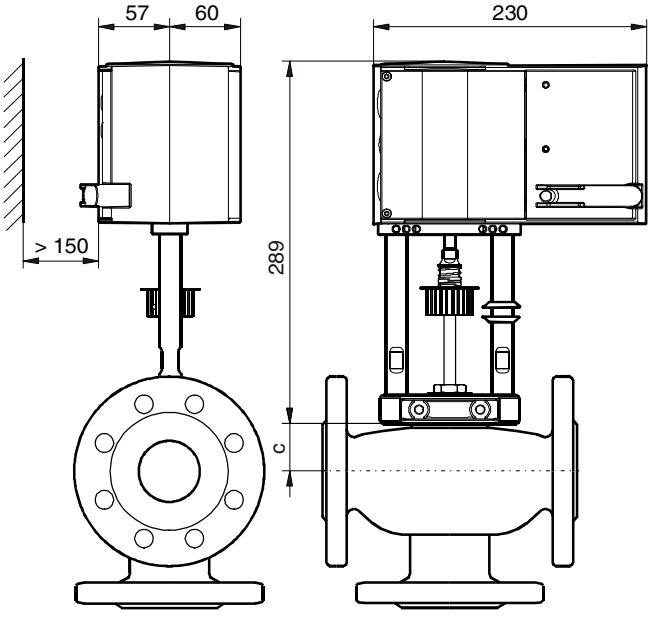
AVM 104 / 105 / 114 / 115 /S AVM / AVF / 124 / 125 /S

372145, 372286

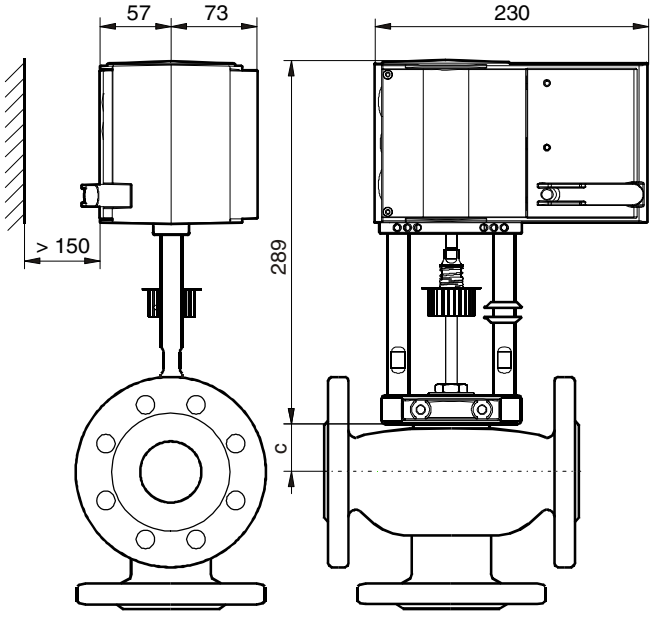




AVM 234

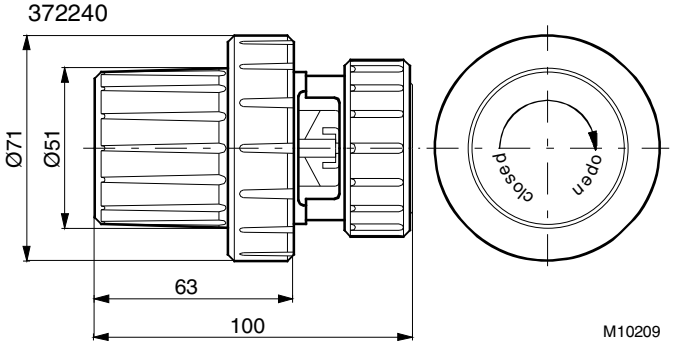


AVF 234

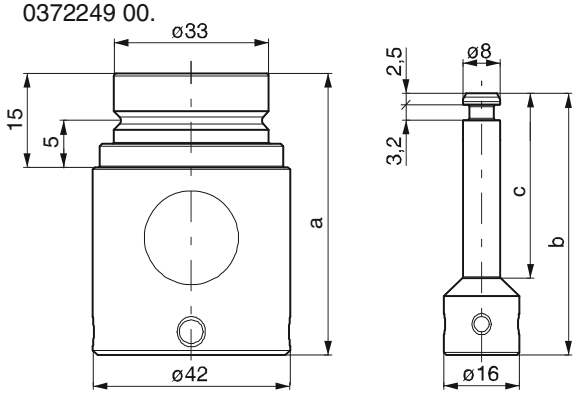


Accessories

372240

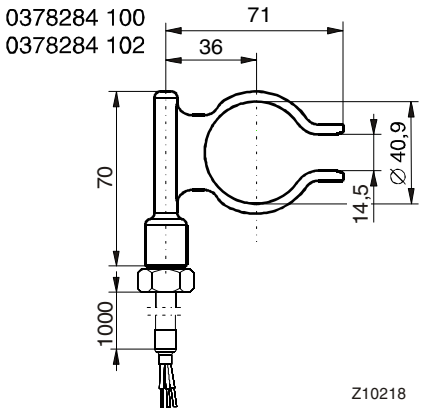


0372249 00.



	a [mm]	b [mm]	c [mm]
0372249 001	60	55,8	40
0372249 002	80	75,8	60

0378284 100
0378284 102



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