



Motorized control valves

VM 2, VB 2

Pressure balanced valves

Description

VM 2 and VB 2 are two-way valves designed to work with Danfoss electric actuators AMV(E) 10, AMV(E) 20, AMV(E) 30 or Danfoss electric actuators with spring return function AMV(E) 13, AMV(E) 23 and AMV(E) 33.

These VM 2 and VB 2 valves are generally recommended for use in most demanding conditions in systems such as:

- district heating,
- heating,
- hot water service with heat exchanger or storage tank where they ensure long and unproblematic performance.

Features & benefits

- SPLIT characteristic developed for most demanding applications
- High closing Δp with small sized actuators
- Several k_{vs} values
- Push connection for easy mechanical connection with actuator
- Control range min. 50:1
- Fast and stable regulation
- More comfort due to stable DHW temp.
- Energy saving due to stable control
- Longer lifetime of components due to less temperature oscillation

Ordering

Product code numbers

Type	Diameter [mm]	Connection types	Connection size	Kvs values [m ³ /h]	Stroke [mm]	Code number
VM 2	15	External Thread	G 3/4 A	0.25	5.00	065B2010
VM 2	15	External Thread	G 3/4 A	0.40	5.00	065B2011
VM 2	15	External Thread	G 3/4 A	0.63	5.00	065B2012
VM 2	15	External Thread	G 3/4 A	1.00	5.00	065B2013
VM 2	15	External Thread	G 3/4 A	1.60	5.00	065B2014
VM 2	15	External Thread	G 3/4 A	2.50	5.00	065B2015
VM 2	20	External Thread	G 1 A	4.00	5.00	065B2016
VM 2	25	External Thread	G 1 1/4 A	6.30	5.00	065B2017
VM 2	32	External Thread	G 1 1/2 A	10.00	7.00	065B2018
VM 2	40	External Thread	G 2 A	16.00	10.00	065B2019
VM 2	50	External Thread	G 2 1/2 A	25.00	10.00	065B2020
VM 2	15	External Thread	G 3/4 A	4.00	5.00	065B2026
VM 2	20	External Thread	G 1 A	6.30	7.00	065B2027
VM 2	25	External Thread	G 1 1/4 A	8.00	5.00	065B2028
VM 2	32	External Thread	G 1 3/4 A	10.00	7.00	065B2029
VB 2	15	Flange		0.25	5.00	065B2050
VB 2	15	Flange		0.40	5.00	065B2051
VB 2	15	Flange		0.63	5.00	065B2052
VB 2	15	Flange		1.00	5.00	065B2053
VB 2	15	Flange		1.60	5.00	065B2054
VB 2	15	Flange		2.50	5.00	065B2055
VB 2	15	Flange		4.00	5.00	065B2056
VB 2	20	Flange		6.30	5.00	065B2057
VB 2	25	Flange		10.00	7.00	065B2058
VB 2	32	Flange		16.00	10.00	065B2059
VB 2	40	Flange		25.00	10.00	065B2060
VB 2	50	Flange		40.00	10.00	065B2061

Note:

1. **VB 2** k_{vs} values according to VDI/VDE 2173

Example:

2-way valve VM 2; DN 15; k_{vs} 1,6; PN 25; t_{max} 150 °C; ext. thread

- 1× VM 2 DN 15 valve

Code No.: **065B2014**

Option:

- 1× Tailpieces

Code No.: **003H6908**

Accessories code numbers

Type	For valve size	Connection size	Code number
Thread tailpieces	DN 15	G 3/4 R 1/2	003H6902
Thread tailpieces	DN 20	R 3/4 G 1	003H6903
Thread tailpieces	DN 25	G 1 1/4 R 1	003H6904
Thread tailpieces	DN 32	Rp 1 1/4 G 1 3/4	003H6905
Thread tailpieces	DN 32	R 1 1/4 G 2 1/2	003H6906
Thread tailpieces	DN 40	R 1 1/2	065B2004
Thread tailpieces	DN 50	R 2	065B2005
Weld-on tailpieces	DN 15	G 3/4	003H6908
Weld-on tailpieces	DN 20	G 1	003H6909
Weld-on tailpieces	DN 25	G 1 1/4	003H6910
Weld-on tailpieces	DN 32	G 1 3/4	003H6911
Weld-on tailpieces	DN 32	G 1 1/2	003H6914
Weld-on tailpieces	DN 40	G 2	065B2006
Weld-on tailpieces	DN 50	G 2 1/2	065B2007

Note:

1. weld-on tailpieces (steel), ext thread (brass)
2. **003H6911** and **003H6905** - for valve code No. 065B2029 (G 1 3/4 A)
3. **003H6914** and **003H6906** - for valve code No. 065B2018 (G 1 1/2 A)

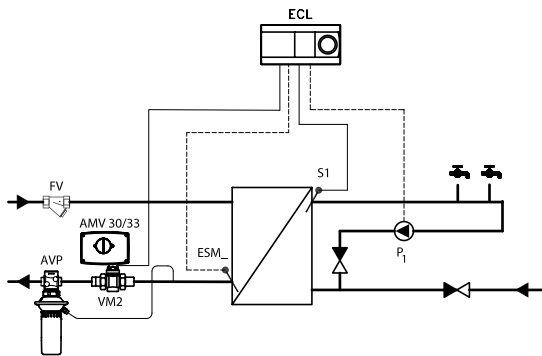
Spare parts code numbers

Description	Code number
VALVE INSERT VM2 DN15 KVS=1,0	065B2033
VALVE INSERT VM2 DN15 KVS=1,6	065B2034
VALVE INSERT VM2 DN15 KVS=2,5	065B2035
VALVE INSERT VM2 DN20 KVS=4	065B2036
VALVE INSERT VM2 DN25 KVS=6,3	065B2037
VALVE INSERT VM2 DN32 KVS=10,0	065B2038
VALVE INSERT VM2 DN40 KVS=16,0	065B2039
VALVE INSERT VM2 DN50 KVS=25,0	065B2040
Valve insert VM2 DN25 kvs 8	065B2041
STUFFING BOX VB2	065B2070

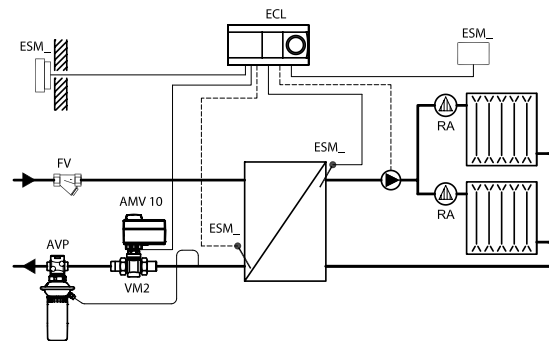
Overview

Application examples

Application principles



Hot water service application with heat exchanger



Heating application, indirect district heating substation

Product details

General data

Technical data

Nominal diameter, DN	15	15	15	15	15	15	15	20	20	25	25	32	40	50
k_{vs} value, VM 2 (m ³ /h)	0.25	0.40	0.63	1.0	1.6	2.5	4.0	4.0	6.3	6.3	8.0	10	16	25
k_{vs} value, VB 2 (m ³ /h)	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	6.3	10	10	16	25	40
Stroke, VM 2 (mm)	5	5	5	5	5	5	5	5	7	5	5	7	10	10
Stroke, VB 2 (mm)	5	5	5	5	5	5	5	5	5	7	7	10	10	10
Control range	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1	> 50:1
Control characteristic	split characteristic													
Cavitation factor z	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5
Leakage acc. to standard IEC 534	max. 0,05% of k_{vs}													
Nominal pressure, PN	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Medium	Circulation water / Glycolic water up to 30 %													
Medium pH	Min. 7, Max. 10													
Medium temperature (°C)	2 ... 150													
Connections, VM 2	External thread acc. to ISO 228-1													
Connections, VB 2	Flange PN 25 ass. to EN 1092-2													

Δp closing pressure VM 2

Type	DN (mm)	k_{vs} (m ³ /h)	AMV(E) 10/13 (bar)	AMV(E) 20/23, 30/33 (bar)
VM 2	15	0.25-4.0	16	16
VM 2	20	4.0	25	25
VM 2	20	6.3	16	25
VM 2	25	6.3	16	25
VM 2	25	8.0	16	25
VM 2	32	10	16	25
VM 2	40	16	-	16
VM 2	50	25	-	16

Δp closing pressure VB 2

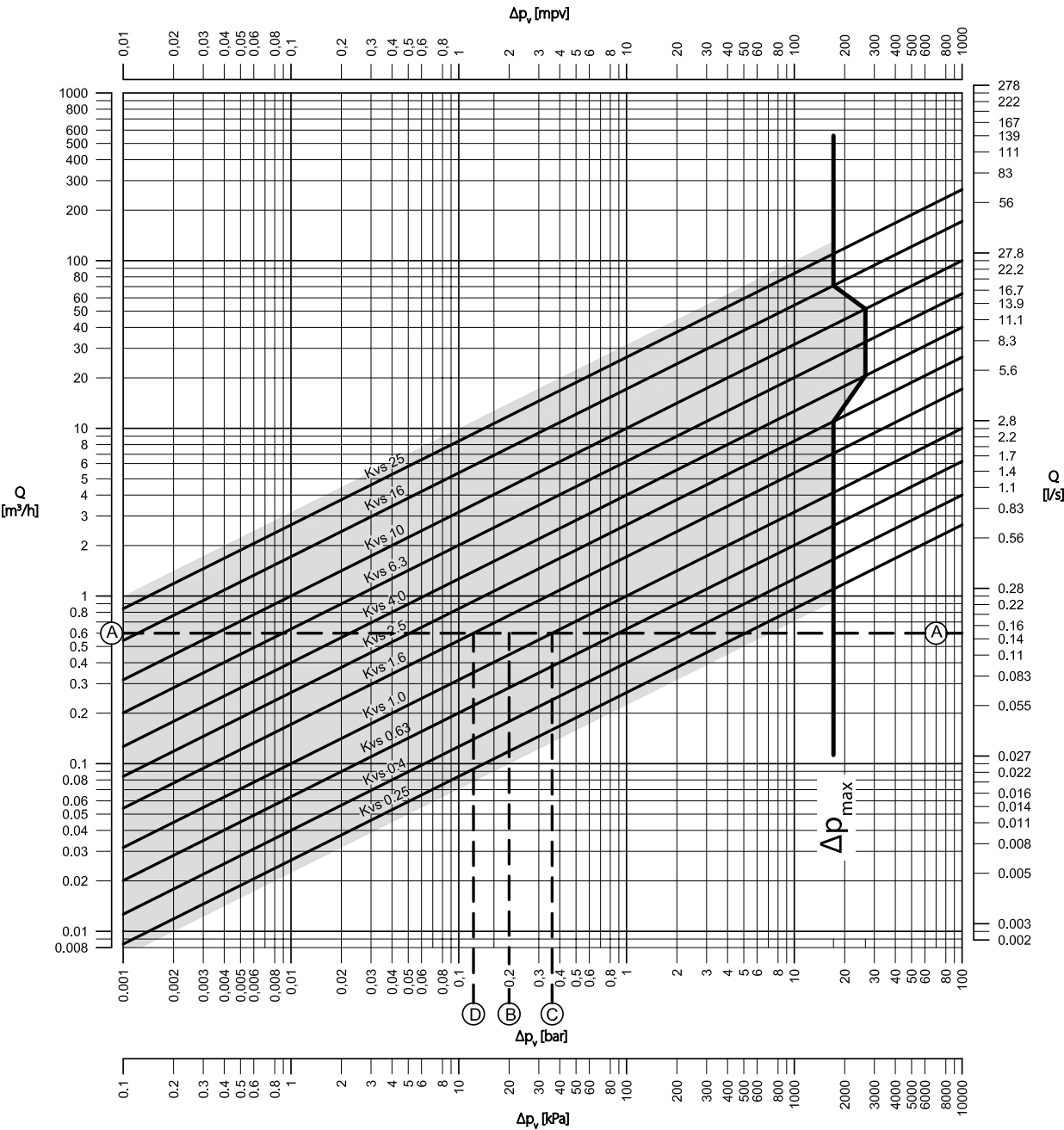
Type	DN (mm)	k_{vs} (m ³ /h)	AMV(E) 10/13 (bar)	AMV(E) 20/23, 30/33 (bar)
VB 2	15-25	0,25-10	16	16
VB 2	32-50	16-40	-	16

Max. closing pressure: 16bar or 25 bar (see table above) depends on valve and actuator combination. Max. closing pressure means that the valve can close against this pressure if the pressure is applied after closing of the valve.

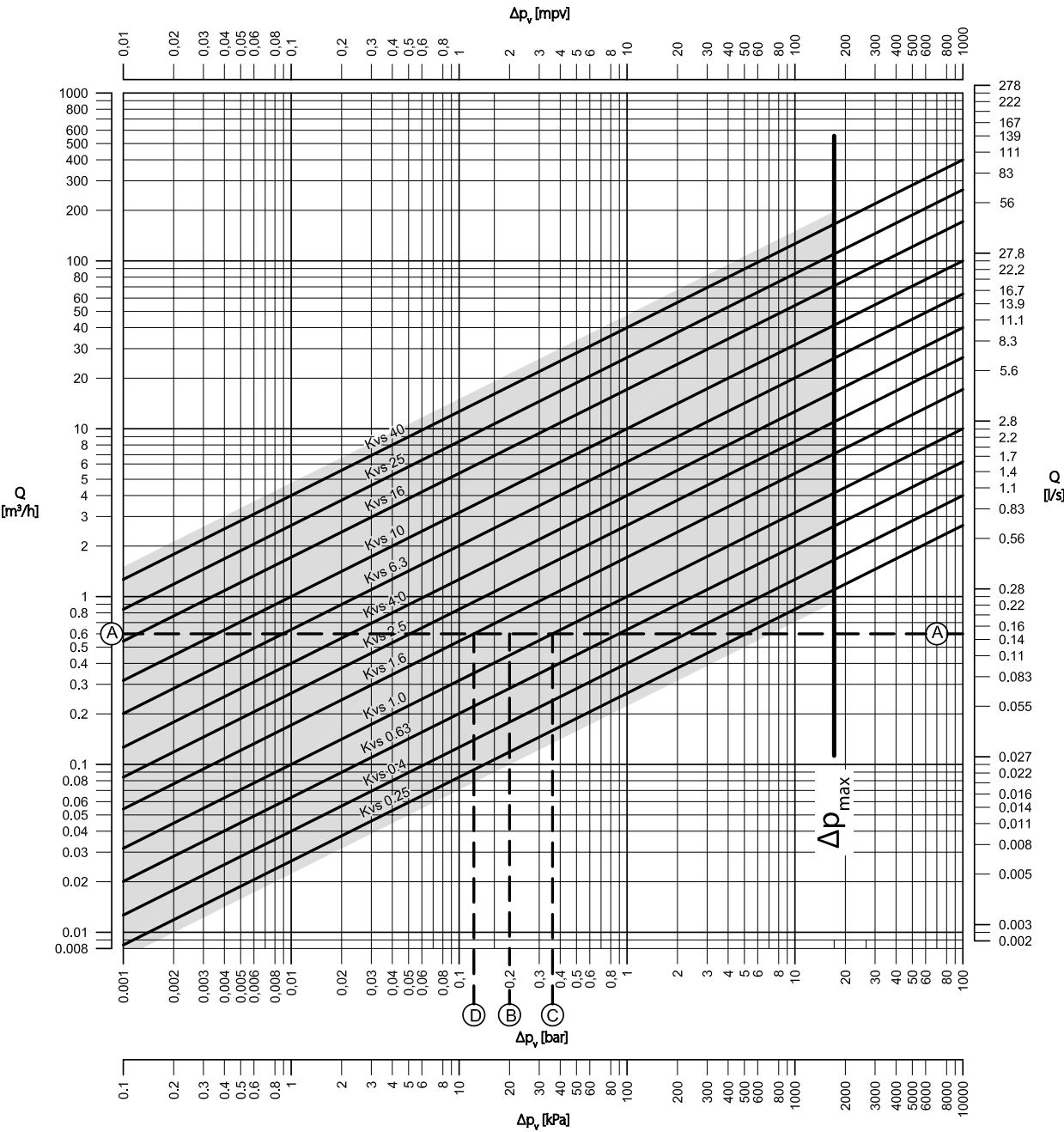
Max. operating pressure: 12bar (recommended 4bar to avoid high noise level and cavitation). Max. operating pressure means no sucking will occur in entire valve stroke and valve can close against this pressure from open position.



Sizing



VM 2



VB 2

Example:

Design data:

Flow rate: 0.6 m³/h

System pressure drop: 20 kPa

Locate the horizontal line representing a flow rate of 0.6 m³/h (line A-A). The valve authority is given by the equation:

$$\text{Valve authority, } a = \frac{\Delta p_1}{\Delta p_1 + \Delta p_2}$$

Where:

 Δp_1 = pressure drop across the fully open valve Δp_2 = pressure drop across the rest of the circuit with a full open valve

The ideal valve would give a pressure drop equal to the system pressure drop (i.e. an authority of 0.5):

if: $\Delta p_1 = \Delta p_2$

$$a = \frac{\Delta p_1}{2 \times \Delta p_1} = 0.5$$

In this example an authority of 0.5 would be given by a valve having a pressure drop of 20 kPa at that flow rate (point B). The intersection of line A-A with a vertical line drawn from B lies between two diagonal lines; this means that no ideally-sized valve is available.

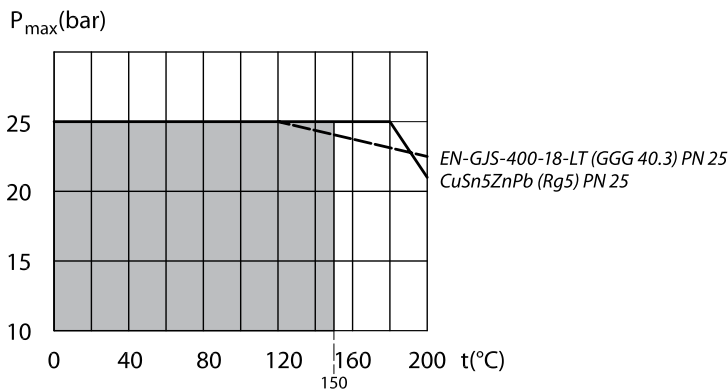
The intersection of line A-A with the diagonal lines gives the pressure drops stated by real, rather than ideal, valves. In this case, a valve with k_{vs} 1.0 would give a pressure drop of 36.0 kPa (point C):

$$\text{hence valve authority} = \frac{36}{36+20} = 0.64$$

The second largest valve, with k_{vs} 1.6, would give a pressure drop of 14 kPa (point D):

$$\text{hence valve authority} = \frac{14}{14+20} = 0.41$$

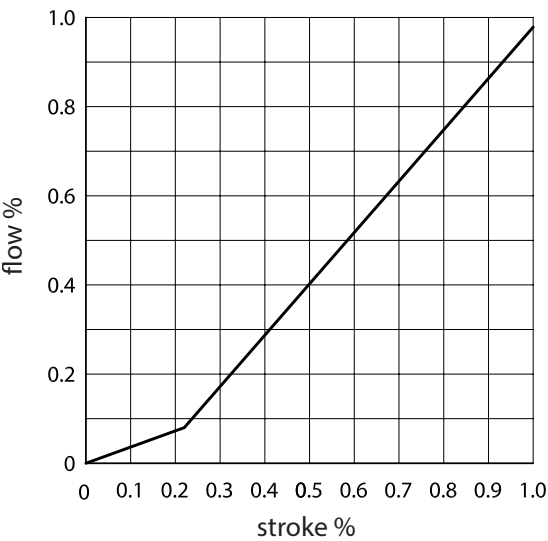
Generally, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal authority is 0.5 with a preferred range of between 0.4 and 0.7.

Pressure and temperature data**Pressure temperature diagram**

Maximum allowed operating pressure as a function of medium temperature (according to EN 1092-2 and EN 1092-3).

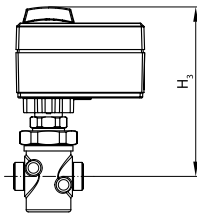


Split characteristic

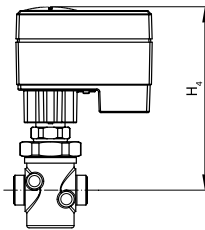


Fast and stable regulation also at small flow rates. Less temperature oscillation.

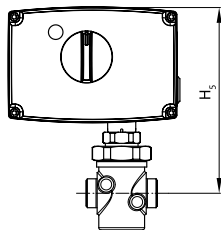
Dimensions



VM 2 + AMV(E) 10

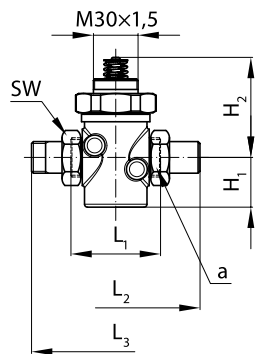


VM 2 + AMV(E) 13

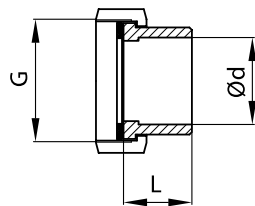


VM 2 + AMV(E) 20/30, 23/33

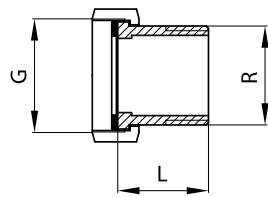
Type	H ₁ (mm)	H ₂ (mm)	H ₃ (mm)	H ₄ (mm)	H ₅ (mm)	L ₁ (mm)	L ₂ (mm)	L ₃ (mm)	SW (mm)	a ISO 228/1	Weight (kg)
VM 2 15	33	70	163	166	176	65	139	120	30	G ¾A	0.80
VM 2 20/4.0	33	70	163	166	176	70	154	131	37	G 1A	0.83
VM 2 20/6.3	33	70	163	166	176	70	154	131	37	G 1A	0.83
VM 2 25	38	70	163	166	176	75	159	145	46	G 1¼A	0.98
VM 2 32	38	70	163	166	176	100	184	177	63	G 1½A	1.18
VM 2 32	38	70	163	166	176	100	184	182	63	G 1 ¾A	1.22
VM 2 40	38	88	-	-	194	110	244	200	64	G 2A	2.34
VM 2 50	44	88	-	-	194	130	298	244	81	G 2½A	3.25



Type	DN	k_{vs} (m ³ /h)	AMV(E) 10/13	AMV(E) 20/23; AMV(E) 30/33
VM 2	15	0.25-4.0	yes	yes
VM 2	20	4.0	yes	yes
VM 2	20	6.3	yes	yes
VM 2	25	6.3-8.0	yes	yes
VM 2	32	10	yes	yes
VM 2	40	16	no	yes
VM 2	50	25	no	yes



Weld-on tailpieces



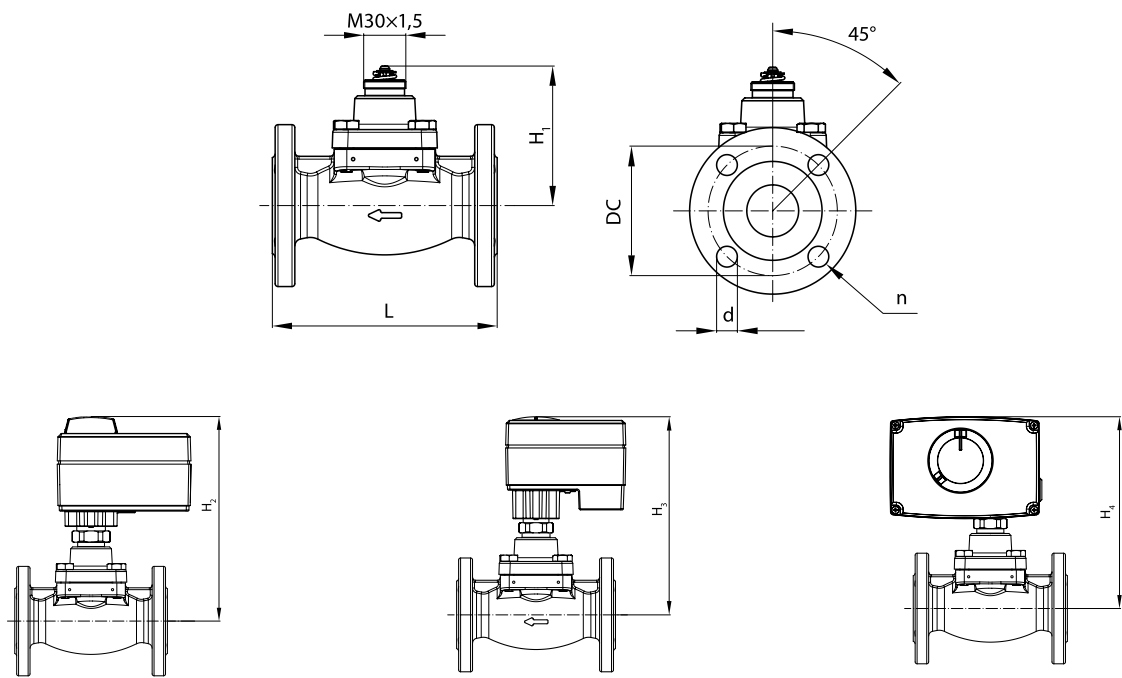
Tailpieces with external threads

Weld on

DN	G (")	Ød (mm)	L (mm)	Weight (kg)
15	¾	15	35	0.18
20	1	20	40	0.26
25	1 ¼	27	40	0.38
32	1 ½	35	40	0.48
32	1 ¾	37	40	0.48
40	2	40	65	0.90
50	2 ½	50	82	1.70

Ext. thread

DN	G (")	R (")	L (mm)	Weight (kg)
15	¾	½	25.5	0.18
20	1	¾	28.5	0.26
25	1 ¼	1	33	0.38
32	1 ½	1 ¼	36.5	0.62
32	1 ¾	1 ¼	36.5	0.62
40	2	1 ½	43	0.90
50	2 ½	2	55	1.70



VB 2 + AMV(E) 10

VB 2 + AMV(E) 13

VB 2 + AMV(E) 20/30, 23/33

Type	H ₁ (mm)	H ₂ (mm)	H ₃ (mm)	H ₄ (mm)	L (mm)	DC (mm)	d (mm)	n (mm)	Weight (kg)
VB 2 15	99	192	195	205	130	65	14	4	3.40
VB 2 20	99	192	195	205	150	75	14	4	4.23
VB 2 25	99	192	195	205	160	85	14	4	4.65
VB 2 32	123	-	-	229	180	100	18	4	8.40
VB 2 40	123	-	-	229	200	110	18	4	9.24
VB 2 50	123	-	-	229	230	125	18	4	10.91

Type	DN	k _{vs} (m ³ /h)	AMV(E) 10/13	AMV(E) 20/23; AMV(E) 30/33
VB 2	15-25	0.25-10	yes	yes
VB 2	32-50	16-40	no	yes

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Issuer	Approval topic
EAC Declaration	EAC KZ 7100841.13.12.02339	EAC - Eurasian Customs Union	MD
UA Declaration	Danfoss UA 10.01.23 Heat Control Valves	Danfoss	
Export Control Declaration	Motorized control valves	Danfoss	
Pressure Safety Certificate	Certificate B (UA.TR.131.B.2655-26) Control valves	Academtest LLC	Pressure
Pressure Safety Certificate	Certificate D (UA.TR.131.B.2655-26) Control valves	Academtest LLC	Pressure
Pressure Safety Certificate	Declaration Control valves	Danfoss	Pressure
EU Declaration	PL08-28_230612EN0854103_EU declaration of conformity_rev6_Control Valves.docx.pdf	Danfoss	Pressure
EU Declaration	Packaging EU Declaration of Conformity 260707EN0801	Danfoss	Packaging

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