Data sheet

Pressure balanced valves
VM 2, VB 2

Description / Application

VM 2

VB 2

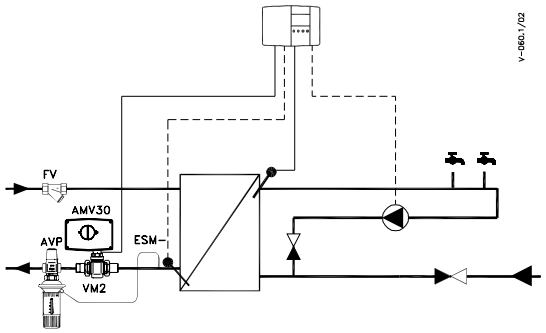
The valves with split characteristic VM 2 and VB 2 are designed to be used with Danfoss actuators AMV(E) 10, AMV(E) 20 and AMV(E) 30 or with Danfoss actuators with spring return function AMV(E) 13 AMV(E) 23 and AMV(E) 33, for long and unproblematic performance in response to the most demanding conditions in systems such as:

- district heating,
- heating,
- hot water service with heat exchanger or storage tank.

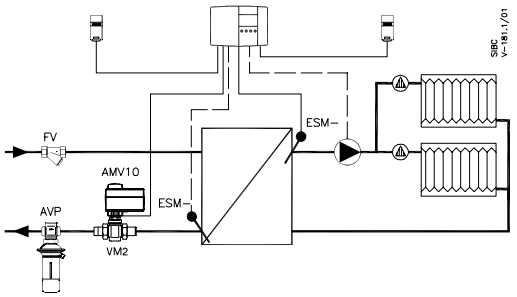
Main data:

- SPLIT characteristic
- Ext. thread PN 25 (VM 2) or flanges PN 25 (VB 2)
- Suitable for water temperatures from 2 to 150 °C.
- Suitable for use with AMV(E) 10/20/30 and AMV(E) 13/23/33 actuators.

Application examples



Hot water service application with heat exchanger



Heating application, indirect district heating substation

Ordering

VM 2 *(ext. thread)*

DN	Ext. thread ISO 228/1	k_{VS} m³/h	Stroke mm	**Code No.**
15	G ¾ A	0.25	5	**065B2010**
		0.4	5	**065B2011**
		0.63	5	**065B2012**
		1.0	5	**065B2013**
		1.6	5	**065B2014**
		2.5	5	**065B2015**
		4.0	5	**065B2026**
20	G 1 A	4.0	5	**065B2016**
		6.3	7	**065B2027**
25	G 1¼ A	6.3	5	**065B2017**
		8.0	7	**065B2028**
32	G 1½ A	10	7	**065B2018**
40	G 2 A	16	10	**065B2019**
50	G 2½ A	25	10	**065B2020**

VB 2 *(flange)*

DN	k_{VS}[1] m³/h	Stroke mm	**Code No.**
15	0.25	5	**065B2050**
	0.4	5	**065B2051**
	0.63	5	**065B2052**
	1.0	5	**065B2053**
	1.6	5	**065B2054**
	2.5	5	**065B2055**
	4.0	5	**065B2056**
20	6.3	5	**065B2057**
25	10	7	**065B2058**
32	16	10	**065B2059**
40	25	10	**065B2060**
50	40	10	**065B2061**

[1] k_{VS} according to VDI/VDE 2173

Spare parts VM 2

	Valve size	**Code No.**
Valve insert	VM 2 DN 15/1.0	**065B2033**
	VM 2 DN 15/2.5	**065B2035**
	VM 2 DN 15/4.0	**065B2036**
	VM 2 DN 20/4.0	**065B2036**
	VM 2 DN 20/6.3	**065B2037**
	VM 2 DN 25/6.3	**065B2037**
	VM 2 DN 25/8.0	**065B2041**
	VM 2 DN 32/10	**065B2038**
	VM 2 DN 40/16	**065B2039**
	VM 2 DN 50/25	**065B2040**

Spare parts VB 2

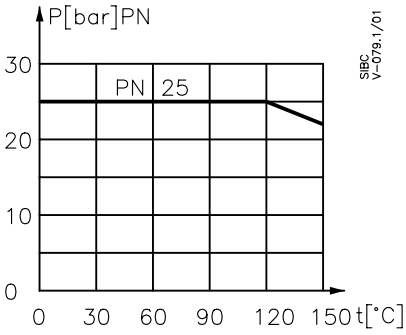
	Valve size	**Code No.**
Stuffing box	VB 2 DN 15 - 50	**065B2070**

Accessories for VM 2

DN	Weld-on tailpieces **Code No.**	Tailpieces with ext. threads **Code No.**
15	**003H6908**	**003H6902**
20	**003H6909**	**003H6903**
25	**003H6910**	**003H6904**
32	**003H6914**	**003H6906**
40	**065F6081**	**065F6061**
50	**065F6082**	**065F6062**

Technical data

Pressure stage	PN 25
Medium temperature	2 … 150 °C
Cavitation factor	≥ 0.5
Control characteristic	split characteristic
Leakage acc. to standard IEC 534	max. 0.05% of kvs
Control range	> 50:1
Media	Circulation water / Glycolic water up to 30 %
Flange standard	ISO 7005 - 2
Thread standard	ISO 228 - 1



Temperature and pressure diagram

Δp closing pressure VM 2

Type	DN	k_{VS} /m³/h)	AMV(E) 10/13	AMV(E) 20/23, 30/33
VM 2	15	0.25 - 4.0	16	16
	20	4.0	25	25
	20	6.3	-	25
	25	6.3	16	25
	25	8.0	-	25
	32	10	-	25
	40	16	-	16
	50	25	-	16

Δp closing pressure VB 2

Type	DN	k_{VS} /m³/h)	AMV(E) 10/13	AMV(E) 20/23, 30/33
VB 2	15 - 20	0.25 - 6.3	16	16
	25 - 50	10 - 40	-	16

Materials

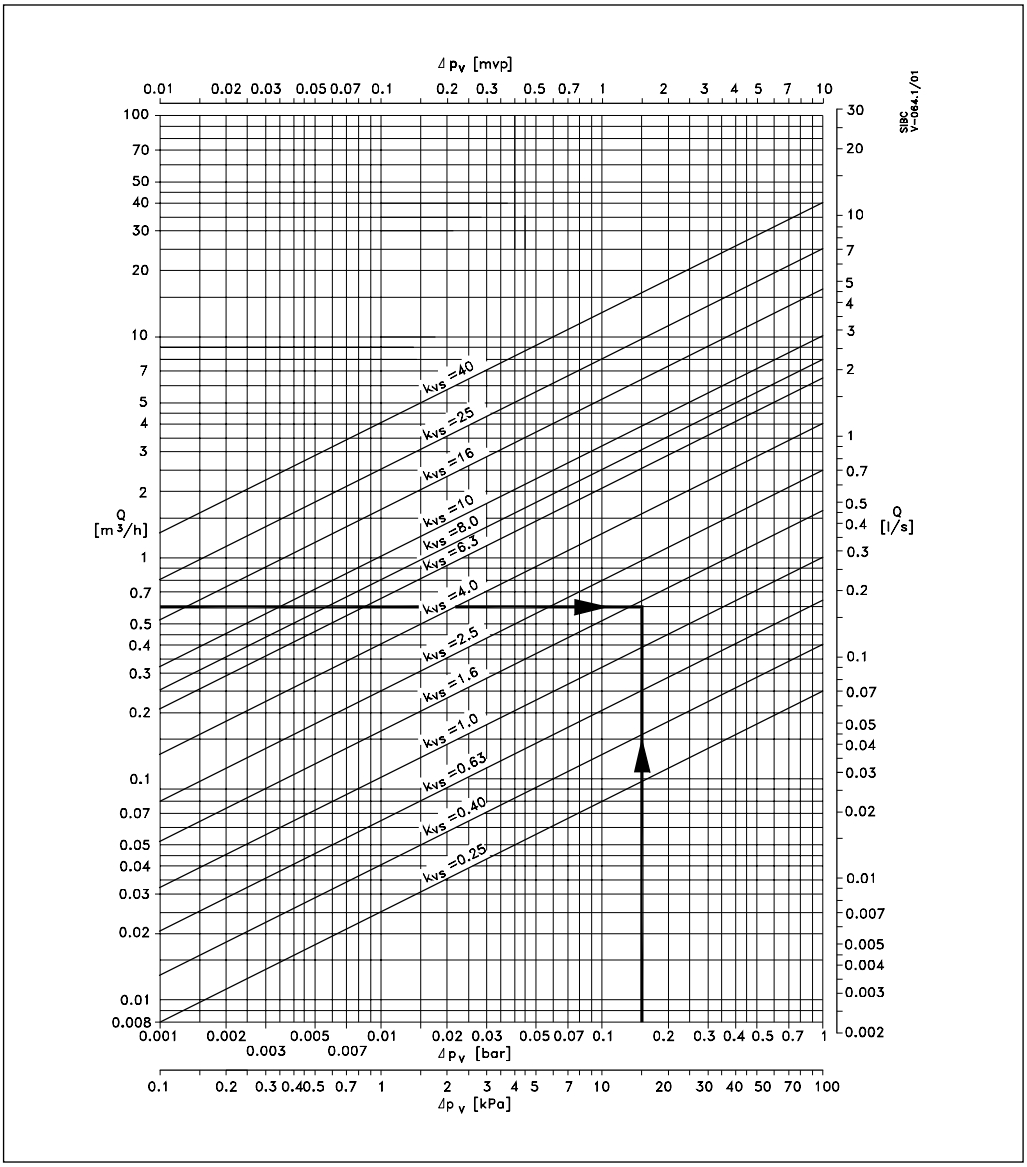
VM 2

Body	Red bronze (Rg 5)
Cone, seat and spindle	Stainless steel
Gasket	EPDM O-rings

VB 2

Body and cover	Ductile iron EN-GJS-400-18-LT (GGG 40.3)
Cone, seat and spindle	Stainless steel
Gasket	EPDM O-rings

Sizing



Example:

Given:

P	=	14 kW	P = heating power (kW)
Δt	=	20 K	Δt = temperature difference (K)
ΔPv =		0.15 bar	ΔPv = differential pressure across the valve (bar)

Current flow Q (m^3/h) through the valve is calculated according to formula:

$$Q = \frac{P \times 0.86}{\Delta t} = \left(m^3/h\right)$$

$$Q = \frac{14 \times 0.86}{20} = 0.6 m^3/h$$

k_{VS} value - flow (m^3/h) in fully opened valve is calculated according to formula:

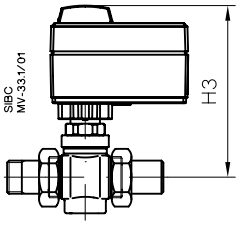
$$k_{VS} = \frac{Q}{\sqrt{\Delta p_v}} = \left(m^3/h\right)$$

$$k_{VS} = \frac{0.6}{\sqrt{0.15}} = 1.5 \rightarrow 1.6 m^3/h$$

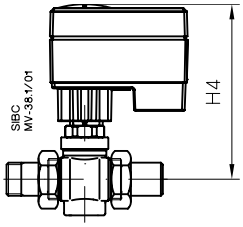
or read from sizing diagram by taking a line through Q scale (0.6 m^3/h) and Δp scale (0.15 bar) to intersect k_{VS} axis at 1.6.

Solution:
1) flange valve VB 2 DN 15/1.6 or
2) ext. thread valve VM 2 DN 15/1.6

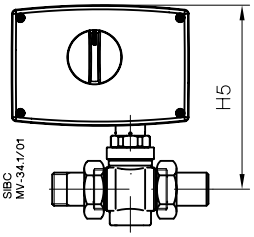
Dimensions



VM 2 + AMV(E) 10

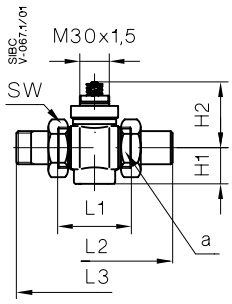


VM 2 + AMV(E) 13



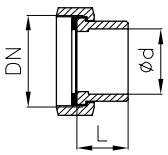
VM 2 + AMV(E) 20/30, 23/33

Type	Stroke (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	a ISO 228/1	SW (mm)	Weight (kg)
VM 2 15	5	33	70	163	166	176	65	139	120	G ¾A	30	0.80
VM 2 20/4.0	5	33	70	163	166	176	70	154	129	G 1A	37	0.83
VM 2 20/6.3	7	33	70	-	-	176	70	154	129	G 1A	37	0.83
VM 2 25/6.3	5	38	70	163	166	176	75	159	144	G 1¼A	46	0.98
VM 2 25/8.0	7	38	70	-	-	176	75	159	144	G 1¼A	46	0.98
VM 2 32	7	38	70	-	-	176	100	184	172	G 1½A	54	1.22
VM 2 40	10	38	88	-	-	194	110	244	195	G 2A	64	2.34
VM 2 50	10	44	88	-	-	194	130	298	252	G 2½A	81	3.25



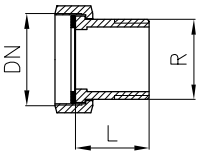
Type	DN	k_{VS} (m^3/h)	AMV(E) 10/13	AMV(E) 20/23; AMV(E) 30/33
VM 2	15	0.25 - 4.0	•	•
	20	4.0	•	•
	20	6.3	-	•
	25	6.3	•	•
	25	8.0	-	•
	32	10	-	•
	40	16	-	•
	50	25	-	•

Weld-on tailpieces



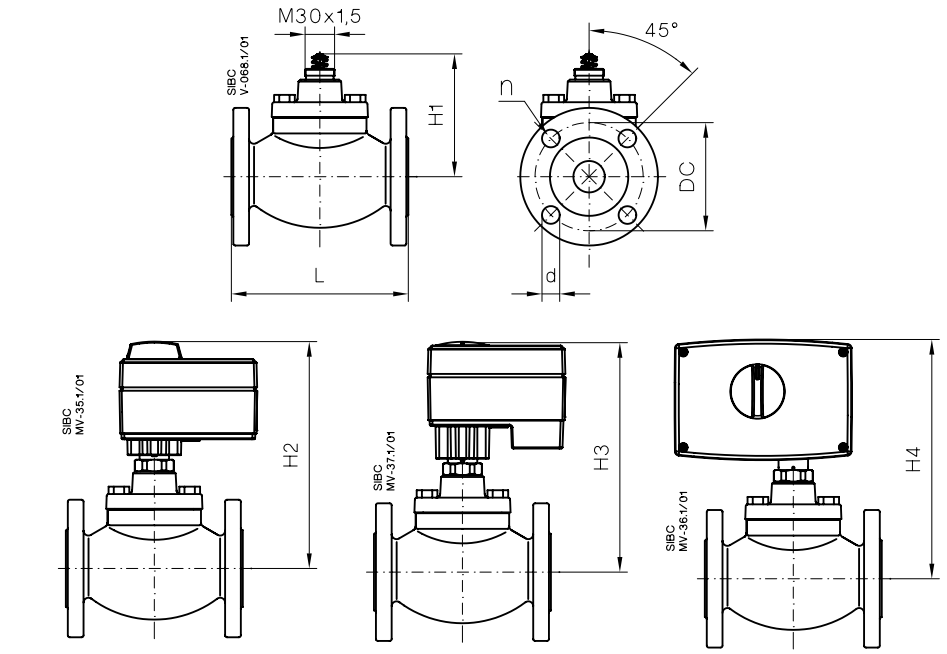
G (mm)	Ød (mm)	L (mm)	Weight (kg)
15	15	35	0.18
20	20	40	0.26
25	27	40	0.38
32	35	40	0.48
40	40	65	0.90
50	50	82	1.70

Tailpieces with external threads



G (")	R (")	L (mm)	Weight (kg)
¾	½	25.5	0.17
1	¾	27.5	0.27
1 ¼	1	32.5	0.45
1 ½	1 ¼	34.0	0.62
2	1 ½	40.5	0.83
2 ½	2	59.0	1.65

Dimensions *(continuous)*



VB 2 + AMV(E) 10 *VB 2 + AMV(E) 13* *VB 2 + AMV(E) 20/30, 23/33*

Type	Stroke (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	L (mm)	DC (mm)	d (mm)	n (mm)	Weight (kg)
VB 2 15	5	99	192	195	205	130	65	14	4	3.40
VB 2 20	5	99	192	195	205	150	75	14	4	4.23
VB 2 25	7	99	-	-	205	160	85	14	4	4.65
VB 2 32	10	123	-	-	229	180	100	18	4	8.40
VB 2 40	10	123	-	-	229	200	110	18	4	9.24
VB 2 50	10	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 - 20	0.25 - 6.3	•	•
	25 - 50	10 - 40	-	•