ENGINEERING
TOMORROW

Data sheet

Seated valve (PN 16 & PN 25)
VFM 2 – Two way valve, flange

Description

Valve for heating, district heating and district cooling systems.

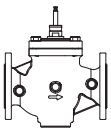
VFM 2 valve can be used together with following Danfoss actuators:
- AMV(E) 655
- AMV(E) 658 SU/SD
- AME 659 SD
- AMV(E) 85/86 (for VFM 2 DN 150-250)

Features:
- Low seat leakage rate (< 0,03 % of k_{vs})
- Rangeability R=
  >100:1 by PN 16
  >100:1 by PN 25 up till DN 125 otherwise >80:1
- Pressure relieved design

Main data:
- DN 65-250
- k_{vs} 63-900 m³/h
- PN 16 & PN 25
- Linear characteristic by 0-30% valve stroke and Logarithmic characteristic by 30-100% valve stroke.
- Stem down to close
- Medium:
  Circulation water / glycolic water up to 50%
- Temperature:
  2 (–10*) … 150 °C
  ** At temperatures from –10 °C up to +2 °C use stem heater*
- Flange PN 16 & 25 connections
- Push-pull connection between valve and actuator
- Compliance with Pressure Equipment Directive 2014/68/EU

Ordering

Valve **VFM 2**

Picture	DN	k_{vs} (m³/h)	PN 16 Δp_s [2] (bar)	PN 25 Δp_s [2] (bar)	$\Delta p_{max.}$ (bar) [1] for **AMV(E)65x**	$\Delta p_{max.}$ (bar) [1] for **AMV(E)85/86**	PN 16 Code No.	PN 25 Code No.
	65	63	16	20	8	-	**065B3500**	**065B3081**
	80	100					**065B3501**	**065B3082**
	100	160		16			**065B3502**	**065B3083**
	125	250					**065B3503**	**065B3084**
	150	400	10	10	4	10	**065B3504**	**065B3085**
	200*	630			3	7	**065B3505**	**065B3086**
	250*	900				5	**065B3506**	**065B3087**

[1] **$\Delta p_{max.}$** *is maximum permissible differential pressure across the valve reffered for the whole actuating range of motorised valve (a function of actuator's performance)*

[2] **Δp_s** *is maximum permissible clossing differential pressure applied in fully closed position of the valve, at which valve will seal tightly (close off pressure)*

* *For DN 200 in combination with AMV(E)85/86: k_{vs} is reduced by 15%*
For DN 250 in combination with AMV(E)85/86: k_{vs} is reduced by 20%

Accessories

Type	DN	Code No.
Stem heater for AMV(E) 85/86	150-250	**065Z7021**
Stem heater for AMV(E) 65X	65-250	**065Z7022**

Service kits

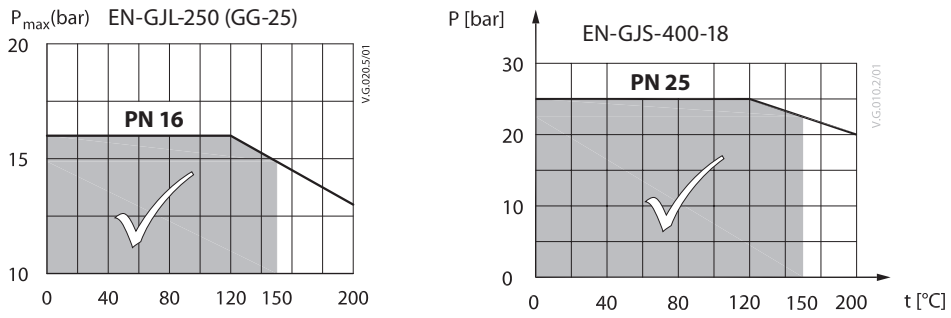
Type		Code No.
Top cover sealing set VFM 2		**065B3528**
Stuffing box	DN 65-125	**065B3529**
	DN 150-250	**065B3530**

Technical data

Nominal diameter	**DN**	**65**	**80**	**100**	**125**	**150**	**200**	**250**
k_{VS} value	m^3/h	63	100	160	250	400	630	900
Stroke	mm	30	34	40			50	
Rangeability **PN 16**		>100:1						
Rangeability **PN 25**		>100:1				>80:1		
Control characteristic		Lin by 0-30% and Log characteristic by 30-100% valve stroke						
Cavitation factor z **PN16 & PN 25**		0.45	0.40	0.35			0.25	0.21
Leakage acc. to standard IEC 534		< 0.03 % of kVS						
Nominal pressure	PN	16 & 25						
Medium		Circulation water / glycolic water up to 50 % (standard VDI 2035)						
Medium pH		Min. 7, Max. 10						
Medium temperature	°C	2 (–10 1)) … 150						
Connections		Flange PN 16 & 25 acc. to EN 1092-2						
Materials								
Valve body and cover		Grey cast iron EN-GJL-250 (GG-25) for PN 16 Ductile iron EN-GJS-400-18 for PN 25						
Valve seat, cone and spindle		Stainless steel						
Stuffing box sealing		EPDM						

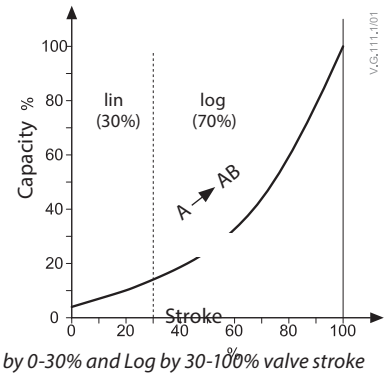
[1] *At temperatures from –10 °C up to +2 °C use stem heater*

Pressure temperature diagram



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

Valve characteristics



Lin by 0-30% and Log by 30-100% valve stroke

Installation

Hydraulic connections
Mount according to flow direction as indicated on valve body.

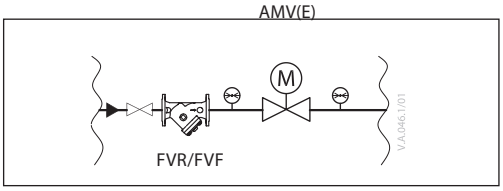
Valve mounting
Before mounting the valve be sure that the pipes are clean and free from swarf. It is essential that the pipes are lined up squarely with the valve at each connection and that they are free from vibrations.

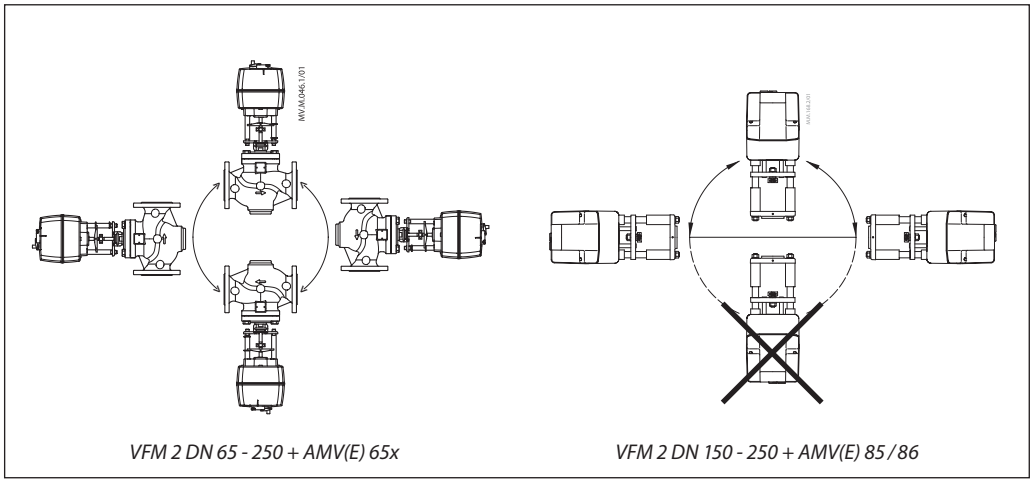
Install the motorized control valves with the actuator in allowed position as described below.

Leave sufficient clearance to facilitate the dismantling of the actuator from the valve body for maintenance purposes.

Note that the actuator may be rotated up to 360° with respect to the valve body by loosening the retaining fixture. After this operation re-tighten.

Note:
Install a strainer upstream of the valve (e.g. Danfoss FVR/FVF)



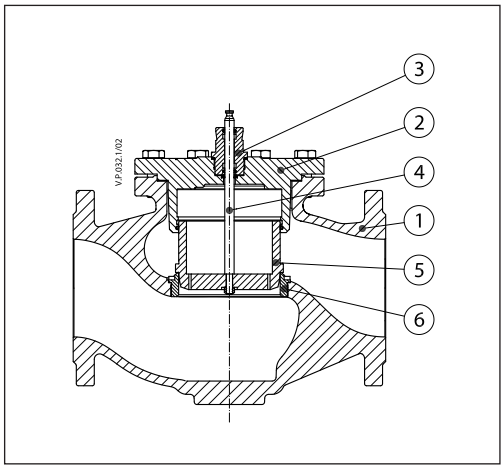


VFM 2 DN 65 - 250 + AMV(E) 65x

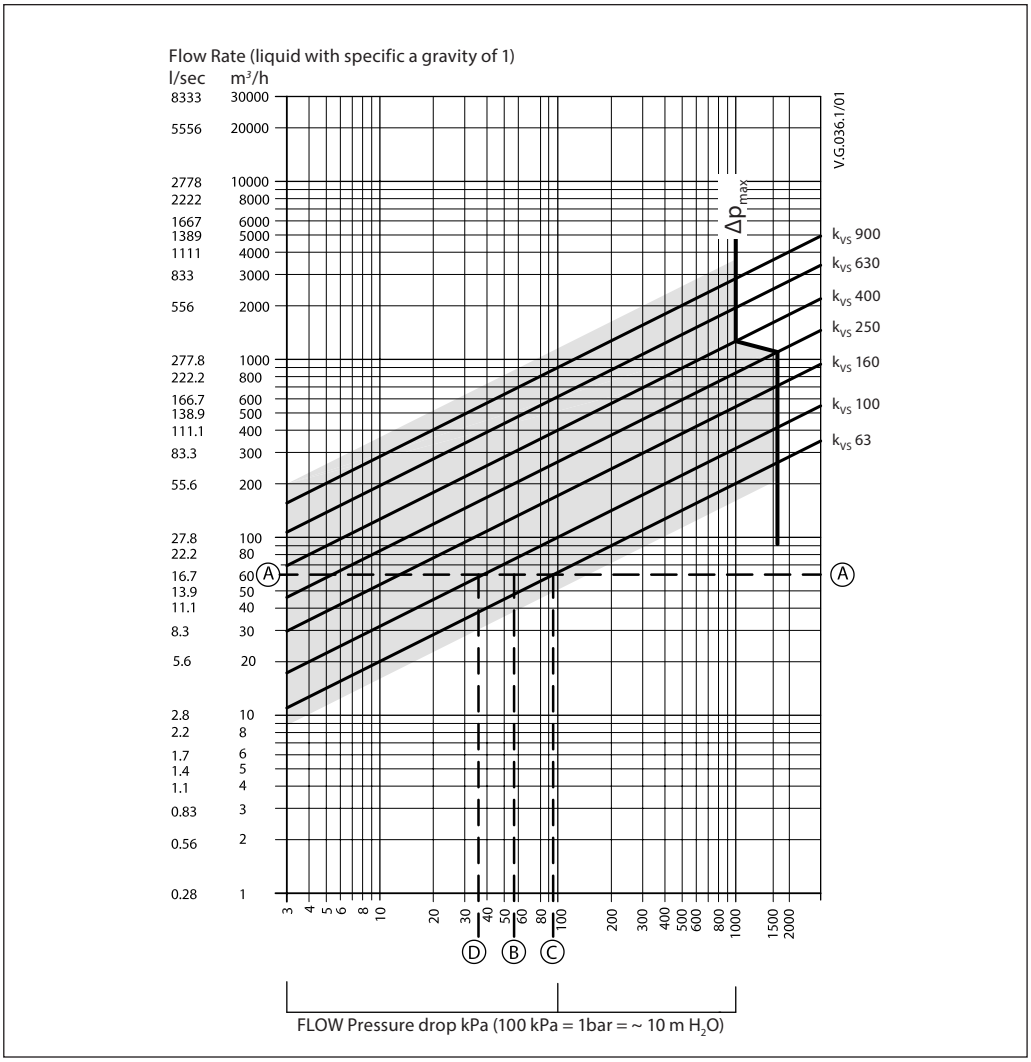
VFM 2 DN 150 - 250 + AMV(E) 85 / 86

Design

1. Valve body
2. Valve cover
3. Stuffing box
4. Valve stem
5. Valve cone (pressure relieved)
6. Valve seat



Sizing



Example

Design data:
Flow rate: 60 m³/h
System pressure drop: 55 kPa

Locate the horizontal line representing a flow rate of 60 m³/h (line A-A). The valve authority is given by the equation:

$$\text{Valve authority, a} = \frac{\Delta p1}{\Delta p1 + \Delta p2}$$

Where:
- Δp1 = pressure drop across the fully open valve
- Δp2 = 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: $\Delta p1 = \Delta p2$

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

In this example an authority of 0,5 would be given by a valve having a pressure drop of 55 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.

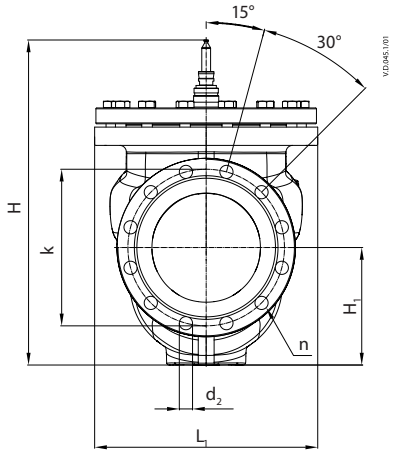
The intersection of line A–A with the diagonal lines gives the pressure drops stated by real, rather than ideal, valves. In this case, a valve with k_{VS} 63 would give a pressure drop of 90,7 kPa (point C):

$$\text{hence valve authority} = \frac{90.7}{90.7 + 55} = 0.62$$

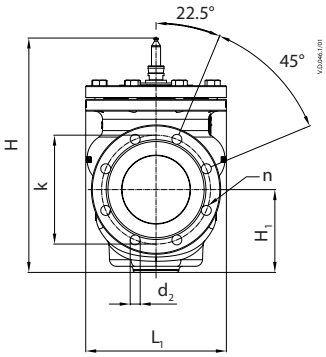
The second largest valve, with k_{VS} 100, would give a pressure drop of 36 kPa (point D):

$$\text{hence valve authority} = \frac{36}{36 + 55} = 0.395$$

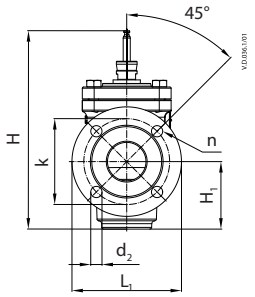
Dimensions



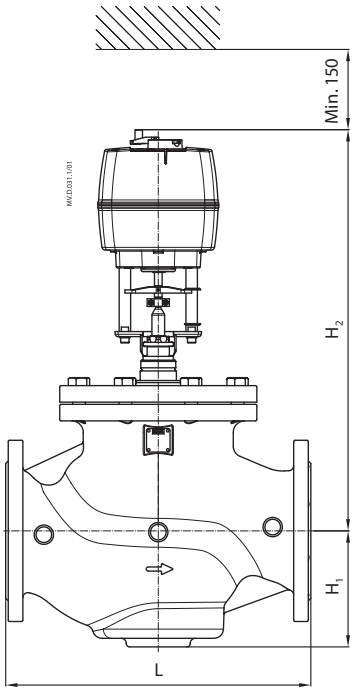
VFM 2 DN 200, 250



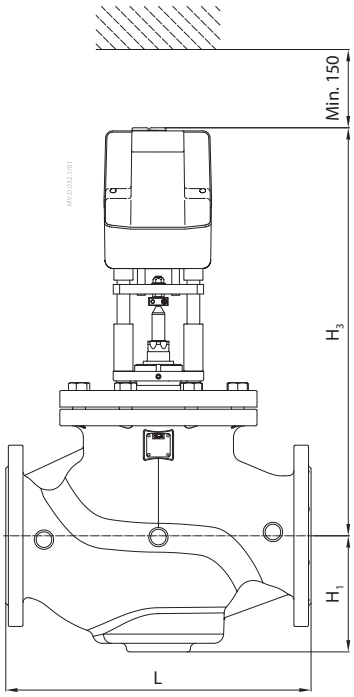
VFM 2 DN 80-150



VFM 2 DN 65



AMV(E) 65x + VFM 2 (DN 65-250)



AMV(E) 85/86 + VFM 2 (DN 150-250)

Type	DN	PN 16							PN 25							PN 16 & PN 25		
		L	L_1	H	k	d_2	n	Weight (kg)	L	L_1	H	k	d_2	n	Weight (kg)	H_1	H_2	H_3
		mm							mm							mm		
VFM 2	65	290	185	336	145	19	4	25	290	185	336	145	19	8	23.5	114	493.5	-
	80	310	200	336	160	19	8	33	310	200	336	160	19	8	27	114	494.5	-
	100	350	242	414	180	19	8	48	350	242	414	190	23	8	46	148	528.5	-
	125	400	250	416	210	19	8	57	400	270	416	220	28	8	56	149	529.5	-
	150	480	310	516	240	22	8	101	480	320	516	250	28	8	102	182.5	628.5	639
	200	600	385	669	295	23	12	208	600	385	669	310	28	12	197	245	686	685
	250	730	500	728	355	26	12	348	730	500	728	370	31	12	334	267	732	732

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