

Motorized control valves for district
heating and cooling systems



Let motorized intelligence solve your application challenges



Perfect control and efficiency for every building and application

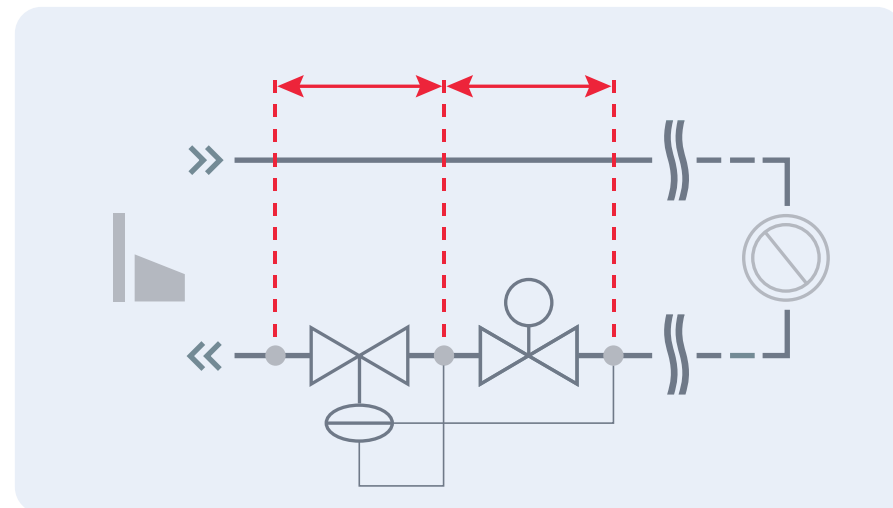


Danfoss Motorized Control Valves (MCV) for district heating and cooling ensure stable and accurate control of water, glycol mixtures and steam. This in turn improves temperature control and reliability while increasing the energy efficiency of the system. All of which adds up to enhanced comfort for the end-user.

Traditional or modern valve approach?

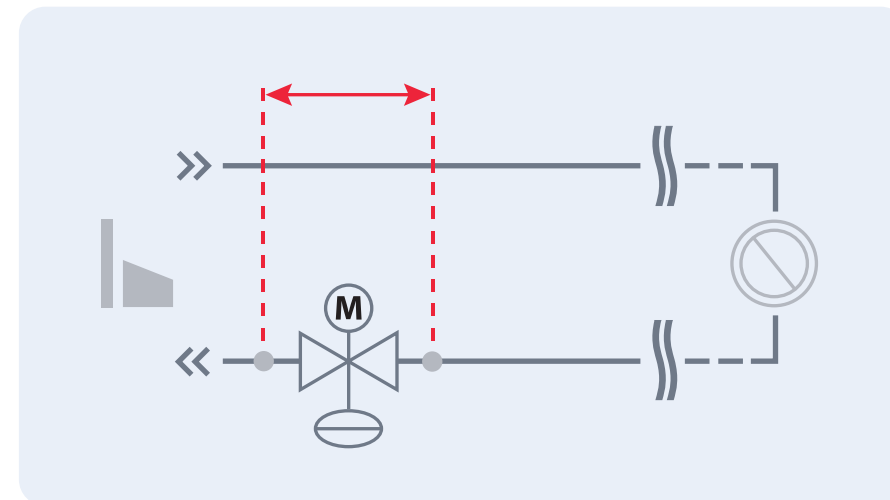
Choosing the right control valve is crucial for optimizing system performance and energy efficiency. Two prominent options are control valves (CV) and pressure-independent control valves (PICV), each offering unique advantages suited to different needs.

Control valves are a traditional choice, relying on a separate differential pressure controller to manage flow fluctuations caused by pressure oscillations. This configuration can be beneficial in systems where maintaining a consistent pressure is challenging. By combining a CV or PRCV with a differential pressure controller, you can achieve stable flow rates, ensuring reliable heating distribution throughout the network. This setup is typically shorter in height but requires more space in width due to the additional components involved. Moreover, it demands detailed design and preparation, including calculations for Kv values and valve authority, to ensure optimal performance.



Pressure-independent control valves represent a modern approach to district heating. PICVs automatically adjust to changes in pressure, maintaining a consistent flow rate regardless of pressure fluctuations in the system. This self-adjusting capability simplifies system design and reduces the need for additional components like differential pressure controllers. The result is enhanced energy efficiency, as PICVs minimize overflows and ensure precise heating control. PICVs are taller in height due to their built-in differential pressure controller but require less space in width, making them a compact choice in installations where horizontal space is limited. Additionally, they are straightforward to select, based solely on the required design flow, eliminating the need for complex calculations.

Ultimately, the choice between CV and PICV valves depends on specific system requirements and spatial constraints. Both options offer distinct benefits, whether you prioritize traditional reliability or modern efficiency. By understanding these differences, you can make an informed decision that aligns with your goals, ensuring a comfortable and sustainable energy solution for every network and building connected to it.



Versatile solutions for different applications
Danfoss control valves and actuators support domestic hot water, district heating and cooling, and steam, with different sizes, materials, connections and functions to meet specific system requirements.

Smart PICV: optimized control built in
Smart PICV combines adjustable differential pressure with two intelligent features, iSET and iNET, to match real operating conditions.

iSET: Automatically adjusts differential pressure to stabilize oscillations during partial- and low-load operation, supporting stable temperature control, improved ΔT and reliable valve performance.

iNET: Enables remote differential pressure adjustment from the control room, helping optimize heat distribution and pumping operation as system demand changes.

The right control signal for your system

Danfoss electric actuators provide reliable and precise control for district heating systems. Paired with our valves, they ensure optimal performance and efficiency. We offer two main control types to fit your specific needs: 3-point control with our series of AMV actuators and for advanced modulating control our AME actuators.

Simple & Reliable

3-Point Control with Danfoss AMV

For straightforward and robust applications, look for actuators with the AMV type name. These actuators operate on a simple “open, close, or hold” command from the controller. This makes Danfoss AMV actuators a cost-effective and highly reliable choice for standard heating systems where simplicity is key.*

* Not relevant for the AME 65x product family.



Precision & Efficiency

Modulating Control with Danfoss AME

When ultimate comfort and energy savings are the goal, choose our modulating actuators, identified by the AME type name. Instead of just opening or closing, AME actuators constantly fine-tune the valve's position based on a variable signal. This precise adjustment perfectly matches the heating demand, which saves significant energy and eliminates uncomfortable temperature swings.



Easy handling and installation



Danfoss MCVs are easy to handle, easy to operate and easy to understand. Quick connection between actuator and valve simplifies installation and commissioning, while external LED visualization and signaling help save time and effort during setup and operation.

Features**

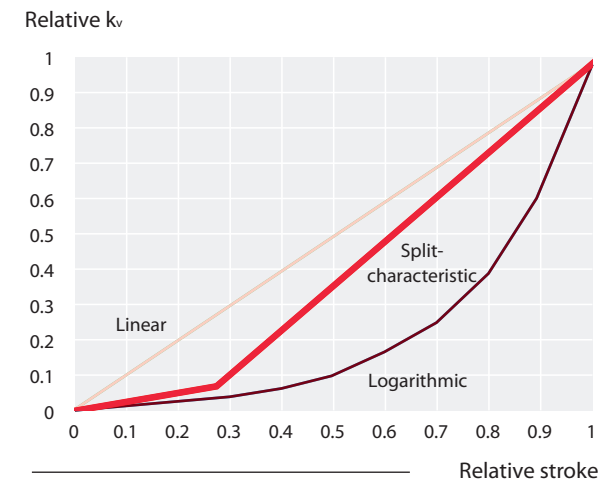
- Easy wiring with the option to prewire the actuators
- Selectable features available on DIP switches
- LED indicators
- Compact design

- 360° installation without compromising IP
- Top-down and side-in mounting of actuator

** Relevant for the AME 65x product family. For features of other actuator versions, refer to the product range overview.

Excellent control performance

The control capabilities of the MCV range are based on different characteristics, including split characteristics for DHW applications using heat exchangers, as well as linear and logarithmic characteristics. This means that even the most difficult control requirements in district heating can be met, while still providing instantaneous hot water.



Relative characteristic comparison

For DHW systems, the low slope of the split characteristic in this part of the stroke ensures stable control of the valve in the critical area near the closing position. On the other hand, the steeper part of the curve (large flow) enables fast and stable control.

Features**

- Anti-oscillation
- Control ratio
- Stroke limitation
- Split characteristics
- Modification of controls characteristic (type 65x)



Increased reliability and operational safety

AME 65x actuators feature built-in thermic and overload protection of the electromotor. This radically reduces the risk of operational failure in either the valve or the system as a whole.

Key features of AME 65x

- Thermic and overload protection
- 360° installation without compromising IP
- Direct inverse functionality
- Safety function (TUV certified) – Spring up (SU), Spring down (SD)

Proven lifetime cost effectiveness

Thanks to easy selection, installation, commissioning and maintenance, Danfoss MCVs simply cost you less time, money and effort.

Features**

- Auto detection of control signal
- Speed selection
- LED signalization
- Option to operate as either 3-point or modulating (type AME)

- Fast connection
- Easy wiring procedure
- Free positioning
- Anti-oscillation function
- Split characteristic of DHW valves

** Relevant for the AME 65x product family. For features of other actuator versions, refer to the product range overview.

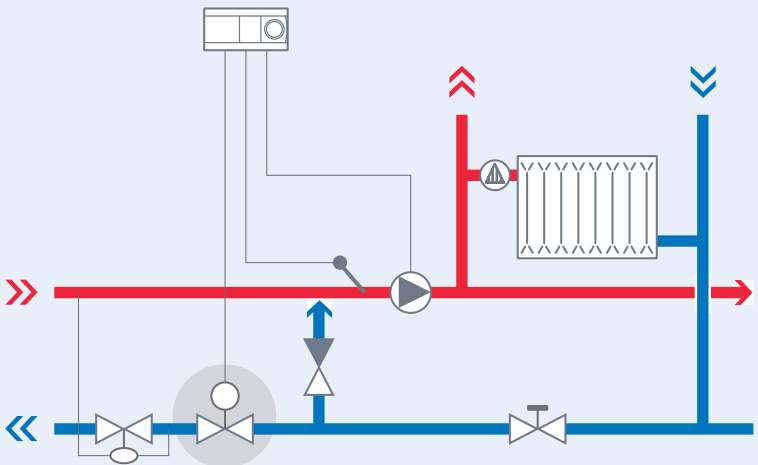
MCV

example applications

Single house with direct system



CV/PRCV



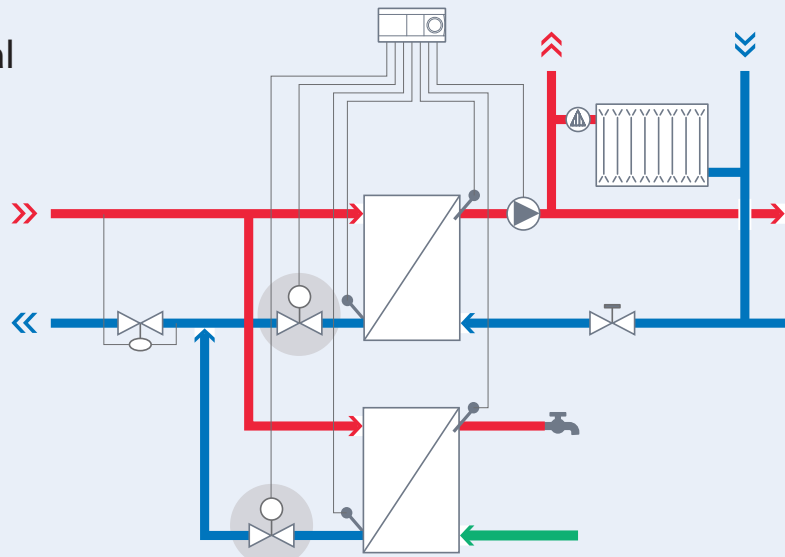
Recommended combination

Valve type	Suitable actuators
VS2	AMV 150, AMV(E) 10/13, 20/23, 30/33
VM2/VB2	AMV(E) 10/13, 20/23, 30/33

Residential/commercial building system



PRCV



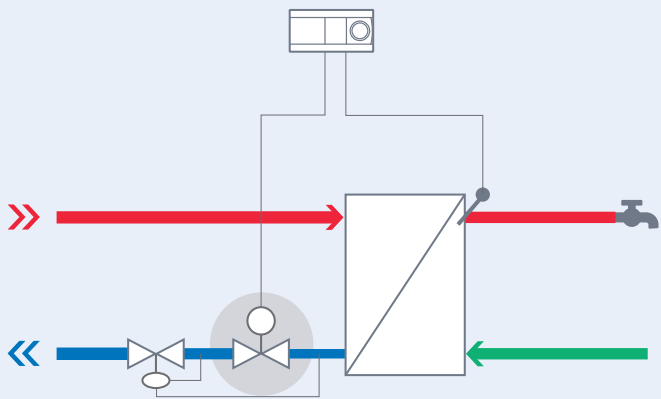
Recommended combination

Valve type	Suitable actuators
VM2/VB2	AMV(E) 10/13, 20/23, 30/33
VFM2	AMV(E) 655, 658 SD, 659 SD

Single house with indirect system



CV/PRCV



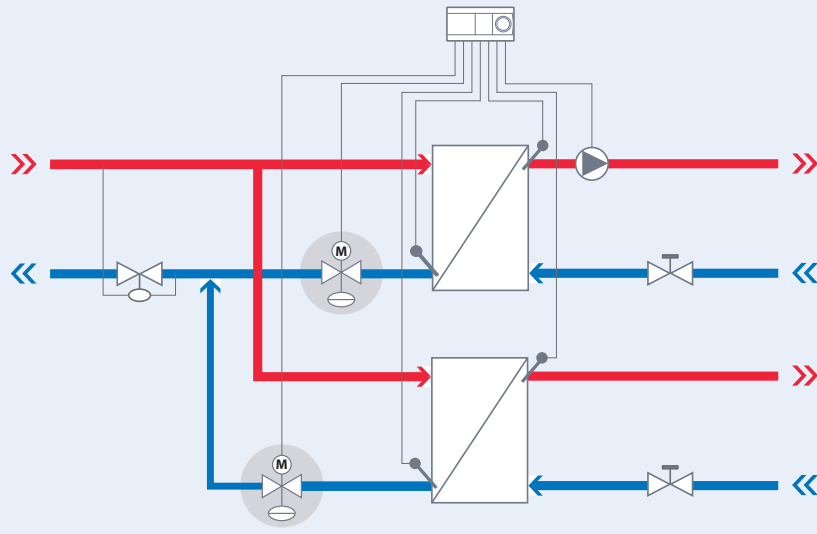
Recommended combination

Valve type	Suitable actuators
VS2	AMV(E) 10/13, 20/23, 30/33
VM2/VB2	AMV(E) 10/13, 20/23, 30/33

Central/distribution station system



PICV



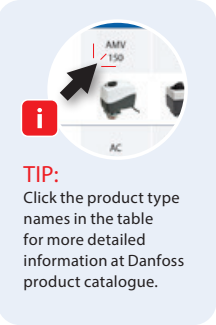
Recommended combination

Valve type	Suitable actuators
AMV(E)	AMV(E) 55/56, 655, 658/659 SD

Danfoss Motorized Control Valves

Product range overview and main characteristics

- 1) Type AMV = 3 point control
Type AME = modulating + 3 point control
- 2) Yes – with AM-PBU 25 battery pack
- 3) PICV = Pressure Independent Control Valve
CV = Control Valve
- 4) AVQML valve can also be equipped with a thermostatic temperature sensor type QTL for Domestic Hot Water applications
- 5) This is a general overview: for detailed dP over different DN's, please see datasheet as you can find in the Danfoss product catalogue when selecting a specific product
- 6) The AME modulating actuators will be equipped with 24V d.c. power supply during 2026



Valves

Type	CV/PICV ³⁾	PN (bar)	DN	Temp. (°C)	Connection	Kvs (m³/h)	Q nom. (m³/h)	Stroke (mm)				dP ⁵⁾ (bar)								Functions	
<u>VS 2</u> 	CV	16	15-25	2-130	Ext. thread	0.25 - 4.0	N/A	4-5	10 (DN15)	10		10	10	10	10	10					
<u>VM 2</u> 	CV	25	15-50	2-150	Ext. thread	0.25 - 25	N/A	5-10		16-25 (DN15-32)		16-25 (DN15-32)	16-25	16-25	16-25	16-25					
<u>VB 2</u> 	CV	25	15-50	2-150	Flange	0.25 - 40	N/A	5-10		16 (DN15-25)		16 (DN15-25)	16	16	16	16					
<u>VFS 2</u> 	CV	25	15-100	2(-10)-200	Flange	0.4 - 145	N/A	15-40									1.5-4.5 / 1-3 (DN65-100)	1.5-4.5 (DN65-100)	1.5-4.5 (DN65-100)	5-13 (DN65-100)	
<u>VFM 2</u> 	CV	16, 25	65-250	2(-10)-150	Flange	63 - 900	N/A	30-50										3-8		5-10 (DN150-250)	
<u>AVQML</u> ⁴⁾ 	PICV	25	15-20	2-110	Ext. thread	N/A	0.8 - 1.9	4	8	8		8									
<u>AHQM</u> 	PICV	16	15-50	2-120	Ext. thread & Flange	N/A	0.43 - 125	5-10		4		4									
<u>AVQM / AVQMT</u> 	PICV	16, 25	15-50	2-150	Ext. thread & Flange	N/A	0.18 - 14	5-10	12-20 (DN15)	12-20 (DN15)		12-20 (DN15)	12-20	12-20	12-20	12-20					
<u>AFQM 6</u> 	PICV	16, 25	40-50	2-150	Flange	N/A	11 - 16	8-12									16-20	16-20	16-20		
<u>AFQM 2</u> 	PICV	16, 25, 40	65-250	2-150	Flange	N/A	28 - 500	12-32									15-16 (PN 16; DN65-125)	10-20	10-20	10-12 (DN150-250)	
<u>AFQMP 2</u> 	PICV	16, 25, 40	65-250	2-150	Flange	N/A	27 - 630	12-32									10-20	10-20	10-20		iSET / iNET



3 good reasons to choose Danfoss

Danfoss has been at the frontier of defining district heating engineering for almost 50 years.
Adding to our leading product portfolio, you get:

01

Application experts

Access to application experts with deep understanding of your challenges.



02

Quality first!

Manufacturing to the highest standards, including ISO 9001/14001 and ISO/TS16949 certifications.



03

Dedicated partner

A full-service, reliable, and dedicated business partner for you with more than 50 years of experience in the district heating business.



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