Let motorized intelligence solve your **application challenges**

For HVAC, central heating, district heating and cooling systems.

More than **100,000** Danfoss MVCs have been installed globally over the past two years.

www.heating.danfoss.com
Danfoss Motorized Control Valves (MCV) for district heating and cooling, HVAC and central heating systems 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.

The MCV range comprises both regular and pressure-relieved control valves designed to operate in the most demanding applications.
Danfoss Commercial Controls offers a comprehensive range of control valves and actuators for virtually every application: central and decentralized heating systems, domestic hot-water systems, district heating and steam.

For maximum versatility, our control valves and actuators come in different sizes, materials and connection options. They also offer a range of different functions and features to suit each specific application.

With a global reputation for quality and reliability, our latest solutions are available at different price points to suit the budgetary needs of every project.
The benefits of choosing Danfoss Motorized Control Valves

Years of customer insights and product development for district heating, HVAC and central heating applications have enabled us to create a flawless product that perfectly complies with all current requirements and future trends. Here are some of the highlights.

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.

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.

Proven lifetime cost effectiveness

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

Your benefits at a glance

- Auto detection of control signal
- Speed selection
- LED signalization
- Option to operate as either 3-point or modulating
- Fast connection
- Easy wiring procedure
- Free positioning
- Anti-oscillation function
- Slip characteristic of DHW valves
Danfoss MCVs are easy to handle, easy to operate and easy to understand. Quick connection to actuator and valve is enabled by a threaded coupling, which also allows for rotation after mounting. External LED visualization and signaling save time and effort during installation and commissioning of MCVs.

Features
» Easy wiring with the option to prewire the actuators
» Selectable features available on jumpers
» LED signalization
» 360° installation without compromising IP
» Top-down and side-in mounting of actuator – compact design

Increased reliability and operational safety

All new products 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.

Features
» Thermic and overload protection
» 360° installation without compromising IP
» Direct inverse functionality
» Safety function (TUV certified) – Spring up (SU), Spring down (SD)
Expand your perspective on motorized control valves

FOR DISTRICT HEATING APPLICATIONS

- Power supply: 24 / 230 V
- Control signal: modulating / 3-point
- Speed range: 2 - 24 s/mm
- Force range: 250 - 5000 N
- Stroke range: 5.5 - 50 mm
- Safety function with DIN TUV available

FOR HEATING AND COOLING APPLICATIONS

- Power supply: 24 / 230 V
- Control signal: modulating / 3-point
- Speed range: 1 - 24 s/mm
- Force range: 200 - 15000 N
- Stroke range: 5.5 - 80 mm
- Safety function available

ELECTRICAL ACTUATORS FUNCTIONS AND FEATURES

- Power supply: 24 / 230 V
- Control signal: modulating / 3-point
- Speed range: 1 - 24 s/mm
- Force range: 200 - 15000 N
- Stroke range: 5.5 - 80 mm
- Safety function available

SEATED CONTROL VALVES FUNCTIONS AND FEATURES

- DN: 15 - 250 mm
- PN: 16 - 25 bar
- Temperature: (-10 ...2)* ...200°C
- Kvs: 0.25 - 900 m³/h
- Media: water, water with glycol, steam
- Thread / Flange: 2 way

* with steam heater

- DN: 15 - 300 mm
- PN: 6 - 16 bar
- Temperature: (-10 ...2)* ...200°C
- Kvs: 0.63 - 1350 m³/h
- Media: water, water with glycol
- Thread / Flange: 2 and 3 way

* with steam heater
FOR TERMINAL AND ZONE APPLICATIONS

ELECTRICAL ACTUATORS
FUNCTIONS AND FEATURES
- Power supply 24 / 230 V
- Control signal modulating / 2, 3-point
- Speed range 12 - 24 s/mm
- Force range 105 - 300 N
- Stroke range 2.8 - 5.5 mm
- Safety function available

SEATED CONTROL VALVES
FUNCTIONS AND FEATURES
- DN 15 - 20 mm
- PN 16 bar
- Temperature 2…120°C
- Kvs 0.25 - 4 m³/h
- Media water, water with glycol
- Thread 2, 3, 4 way
- with bypass

FOR CENTRAL HEATING APPLICATIONS

ELECTRICAL ACTUATORS
FUNCTIONS AND FEATURES
- Power supply 24 / 230 V
- Control signal modulating / 2, 3-point
- Speed range 15 - 480 s/90°
- Torque 5 - 15 Nm
- Rotation angle 90°
- Internal auxiliary switch available

ROTARY VALVES
FUNCTIONS AND FEATURES
- DN 15 - 150 mm
- PN 6 - 10 bar
- Temperature 2…110°C
- Kvs 0.4 - 400 m³/h
- Rotation angle 90°
- Thread / Flange 2, 3, 4 way

FOR CENTRAL HEATING AND HVAC APPLICATIONS

ZONE VALVES
FUNCTIONS AND FEATURES
- Power supply 24 / 230 V
- Control signal 2-point
- Speed range 30 and 60 s/90°
- DN 15 - 50 mm
- Temperature 2…130°C
- dP 6 bar
- Thread 2 and 3 way

DAMPER ACTUATORS
FUNCTIONS AND FEATURES
- Power supply 24 / 230 V
- Control signal modulating / 2, 3 point
- Speed range 40 - 150 s/90°
- Torque 3 - 40 Nm
- Safety function available
- Optional auxiliary switch
### Applicable combinations for district heating

#### Single house with direct system

#### Single house with indirect system

#### Residential/commercial building system

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Suitable actuators</th>
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<tbody>
<tr>
<td>VS2</td>
<td>AMV(E) 10/13, AMV(E) 20/23, AMV(E) 30/33</td>
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<td>VM2/VB2</td>
<td>AMV(E) 10/13, AMV(E) 20/23/30/33</td>
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<tr>
<td>VFM2</td>
<td>AMV(E) 655, 658 SD, 659 SD</td>
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Applicable combinations for district heating and HVAC

### Applicable combinations

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<th>Valve type</th>
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<tr>
<td>VFM2</td>
<td>AMV(E) 655, 658 SD, 659 SD</td>
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<td></td>
<td><strong>Central/distribution station system</strong></td>
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<td><img src="image" alt="Central/distribution station system diagram" /></td>
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### Suitable actuators

- **Central/distribution station system**
  - VFM2: AMV(E) 655, 658 SD, 659 SD
  - VZL3: AMV(E) 130/140, AMV(E) 130H/140H
  - 6-way change-over valve*: AMV(E) 110/120NL/NovoCon*

#### Valve types and suitable actuators

- **Constant flow**
  - VZL3: AMV(E) 130/140, AMV(E) 130H/140H
  - VRB3: AMV(E) 435, AMV(E) 438SU
  - VF3: AMV(E) 435, AMV(E) 438SU

- **Variable flow**
  - AB-QM: AME 110NL/435QM/NovoCon*

#### Notes:

- **AMD**: damper actuators available with or without spring return function.
- *****: Available in second half of 2015

### Recommended combination

- **9**
Applicable combinations for HVAC and central heating

### Chiller application

- **Valve type**: Suitable actuators
  - **VF3**: AMV(E) 435, AMV(E) 438SU, AMV(E) 55/56, AMV(E) 655, 658SU, AMV(E) 685*
  - *Available in second half of 2015*

### Variable flow

- **Valve type**: Suitable actuators
  - **AB-QM**: AME 435, AME 55, AME 85QM

- **Valve type**: Suitable actuators
  - **VRB3**: AMV(E) 435, AMV(E) 438SU
  - **VF3**: AMV(E) 435, AMV(E) 438SU

### Boiler applications

### Recommended combination

#### Constant flow

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*Available in second half of 2015*

### Variable flow

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<td>VF3</td>
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* boiler house
### Applicable combinations for central heating

#### Recommended combination

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<td>HFE3</td>
<td>AMB 162/182</td>
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<tr>
<td>HFE3</td>
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#### Heat pump application

- External heater
- Heat pump with integrated hot water tank
- Thermal unit

#### Solar application

- Buffer tank
- Heat pump with integrated hot water tank
- Thermal unit

#### Priority control of DHW and heating systems

- Buffer tank
- Boiler
- Thermal unit
Danfoss Motorized Control Valves

ACTUATORS for HVAC applications

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<tr>
<th>Type</th>
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<th>AMV65 SU/SD-659SD</th>
<th>AMV65 SU/SD-659SD</th>
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<th>AMV-23SU</th>
<th>AMV-20</th>
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</table>

1) H – manual operation button
2) Yes – with AM-PBU 23 battery pack
3) 2(-10)-130 up to dimensions DN 100;
2(-10)-150 from DN 125-150
4) This is a general overview: for detailed dP over different DN’s, please see datasheet
5) This is 2-point control
6) Hybrid version: modulating and BACnet MS/TP
Digital version: BACnet MS/TP only
7) QM version is recommended

VALVES

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<th>PN (bar)</th>
<th>Temp. (°C)</th>
<th>Type</th>
<th>Ports</th>
<th>DN</th>
<th>Stroke (mm)</th>
<th>dP (%) (bar)</th>
<th>dP (%) (bar)</th>
<th>dP (%) (bar)</th>
<th>dP (%) (bar)</th>
<th>dP (%) (bar)</th>
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<td>10</td>
<td>10</td>
<td>10 (DN15)</td>
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<td>25</td>
<td>2-150</td>
<td>VB</td>
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<td>0.25-40</td>
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<td>25 2(-10)-200</td>
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<td>15-100</td>
<td>5-10</td>
<td>0.4-145</td>
<td>1.5-4.5 (DN65-100)</td>
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<td>5-15</td>
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<td>15-20 (DN65-125)</td>
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<td>VZ</td>
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<td>VL</td>
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<td>VF</td>
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<td>AB-QM M/L/XL</td>
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1) TWA-ZL/Z ABN A5 ABNM AMV/E
2) 0.6 (diverting) / 1.5-3.7 (2-way + mixing) / 1.3 (diverting) (DN200-300)
3) 0.3 (diverting) / 1.5-4.5 / 1-3 (diverting) (DN65-125)

1) TWA-ZL/Z ABN A5 ABNM AMV/E
2) 0.6 (diverting) / 1.5-3.7 (2-way + mixing) / 1.3 (diverting) (DN200-300)
3) 0.3 (diverting) / 1.5-4.5 / 1-3 (diverting) (DN65-125)

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2) 0.6 (diverting) / 1.5-3.7 (2-way + mixing) / 1.3 (diverting) (DN200-300)
3) 0.3 (diverting) / 1.5-4.5 / 1-3 (diverting) (DN65-125)
### Product range overview and characteristics

#### Actuators for HVAC applications

<table>
<thead>
<tr>
<th>AMV(E) 685</th>
<th>AMV(E) 85/1QM86</th>
<th>AMV(E) 65/1QM86</th>
<th>AMV(E) 438 SU</th>
<th>AMV(E) 33</th>
<th>AMV(E) 25 (SU/SD)</th>
<th>AMV(E) 130/140M*</th>
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<th>ABN A5</th>
<th>ABNM</th>
<th>AMV/E 110NL</th>
<th>AMI 140*</th>
<th>NovoCon</th>
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<td>5000 N</td>
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<td>2000 N / 1500 N</td>
<td>400 N</td>
<td>450 N</td>
<td>600 N</td>
<td>1000 N / 450 N</td>
<td>200 N</td>
<td>90</td>
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<td>130</td>
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<td>90</td>
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<td>80</td>
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<td>5.5</td>
<td>2.8</td>
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<td>5 / 6.5</td>
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</table>

#### Flow and torque characteristics

<table>
<thead>
<tr>
<th>AMV(E) 685</th>
<th>AMV(E) 85/1QM86</th>
<th>AMV(E) 65/1QM86</th>
<th>AMV(E) 438 SU</th>
<th>AMV(E) 33</th>
<th>AMV(E) 25 (SU/SD)</th>
<th>AMV(E) 130/140M*</th>
<th>TWA-ZL/Z</th>
<th>ABN A5</th>
<th>ABNM</th>
<th>AMV/E 110NL</th>
<th>AMI 140*</th>
<th>NovoCon</th>
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<tbody>
<tr>
<td>5 - 13</td>
<td>1.5 - 4.5 / 1 - 3</td>
<td>2.25</td>
<td>25: 3-25</td>
<td>25 SU/SD: 6.5-22</td>
<td>4 (DN-100)</td>
<td>4 (DN-132)</td>
<td>2.5-3.5</td>
<td>1-2.5</td>
<td>1-2.5</td>
<td>4 (2-way + mixing) / 1 (diverting)</td>
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<td>5 - 10</td>
<td>10 - 12</td>
<td>15 - 16</td>
<td>25 SU/SD: 4 (D40-100) (2G version only)</td>
<td>2.5-4</td>
<td>4 (2-way + mixing) / 1 (diverting) (DN15-80)</td>
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<tr>
<td>AMV(E) 55: 1.5-3 (2-way + mixing) / 0.3 (diverting) (DN 100)</td>
<td>2.5-4</td>
<td>4 (2-way + mixing) / 1 (diverting) (DN15-80)</td>
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<tr>
<td>AMV(E) 55: 0.5-1.5 (2-way + mixing) / 0.3-0.5 (diverting) (DN125-150)</td>
<td>2.5-4</td>
<td>4 (2-way + mixing) / 1 (diverting) (DN15-80)</td>
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<tr>
<td>AMV(E) 55: 0 (2-way) (DN150)</td>
<td>110NL</td>
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<tr>
<td>AMV(E) 25 SU/SD: 4 (D40-100)</td>
<td>25SU/SD: 4 (D40-100)</td>
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</tbody>
</table>

#### Modulating control

- **AMV**
- **AME**
- **AMV(E)**

#### Actuators for HVAC applications

- **AC/DC**
- **AMV**
- **AME**
- **AMV(E)**

#### Flow and torque characteristics

- **5 - 13 (DN65-100)**
- **5 - 10 (DN150-250)**
- **10 - 12 (DN150-250)**
- **15 - 16 (PN 16; DN65-125)**
- **25 SU/SD: 4 (D40-100) (2G version only)**
- **2.5-3.5**
- **1-2.5**
- **1-2.5**

#### Torque characteristics

- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
- **4 (2-way + mixing) / 1 (diverting)**
## Product range overview

### DAMPER ACTUATORS

**Type**

**Voltage 24 V**
- AC/DC

**Voltage 230 V**
- AC/DC

**Control**
- 2 point

**Safety function**
- no

**Speed (°/90°)**
- 30, 60

**Torque (Nm)**
- 5

**AUX. Switch**
- yes

**Angle of rotation**
- 90°

### DAMPER actuators – non spring return

<table>
<thead>
<tr>
<th>PN (bar)</th>
<th>Voltage 24 V</th>
<th>Voltage 230 V</th>
<th>Control</th>
<th>Safety function</th>
<th>Speed (°/90°)</th>
<th>Torque (Nm)</th>
<th>AUX Switch</th>
<th>Angle of rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>AC</td>
<td>AC</td>
<td>2 point</td>
<td>no</td>
<td>30, 60</td>
<td>5</td>
<td>yes</td>
<td>90°</td>
</tr>
<tr>
<td>6</td>
<td>AC</td>
<td>AC</td>
<td>2 point</td>
<td>no</td>
<td>30, 60</td>
<td>5</td>
<td>yes</td>
<td>90°</td>
</tr>
<tr>
<td>6</td>
<td>AC</td>
<td>AC</td>
<td>2 point</td>
<td>no</td>
<td>30, 60</td>
<td>5</td>
<td>yes</td>
<td>90°</td>
</tr>
</tbody>
</table>

### DAMPER actuators – with spring return

**Type**

**Voltage 24 V**
- AC/DC

**Voltage 230 V**
- AC/DC

**Control**
- 3 point/modulating

**Safety function**
- no

**Speed (°/90°)**
- 15, 30, 60, 90

**Torque (Nm)**
- 10

**AUX. Switch**
- yes

**Angle of rotation**
- 90°

### VALVES

**Type**

**Central heating**
- AMZ 112

**Voltage 24 V**
- AC/DC

**Voltage 230 V**
- AC/DC

**Control**
- 2 point

**Safety function**
- no

**Speed (s/90°)**
- 30s

**Torque (Nm)**
- 5

**AUX. Switch**
- yes

**Angle of rotation**
- 90°
Quality is...

...one of the reasons why our customers stay with us for decades
Long-lasting quality to the core
Danfoss valves

System reliability, building and occupant safety are crucial when it comes to district heating and cooling applications. This is why we give special attention to design and material selection used in our products. Valve bodies are made of high quality red bronze and cast iron or steel. Critical internal parts are made from well-proven stainless steel 1.4404 /1.4571 /1.4021. In combination with a specially designed valve seat and cone, this ensures resistance to cavitation and corrosion. Danfoss products will ensure trouble-free operation, low maintenance and operational costs.

About Danfoss
For more than 75 years Danfoss has been supplying innovative heating solutions that cover everything from individual components to complete district heating systems. Danfoss engineers technologies that enable the world of tomorrow to do more with less. We employ 24,000 people and serve customers in more than 100 countries. Driven by our customers’ needs, we build on years of experience to be at the forefront of innovation, continually supplying components, expertise and complete systems for climate and energy applications.

Today, our advanced, reliable and user-friendly technology helps to keep people comfortable and companies competitive across the world.

We play an active role in the main growth themes in a world that is rapidly changing: infrastructure, food, energy and climate are the focus of our business. Cities for millions that touch the sky. A richer harvest to feed a growing world. Keeping food fresh and our children warm in a world that can make more out of less. This is how we are Engineering Tomorrow.

Read more online at
www.heating.danfoss.com

Valve Ruler App

A selection tool that helps you choose the right combination of valve and actuator.