

ENGINEERING  
TOMORROW

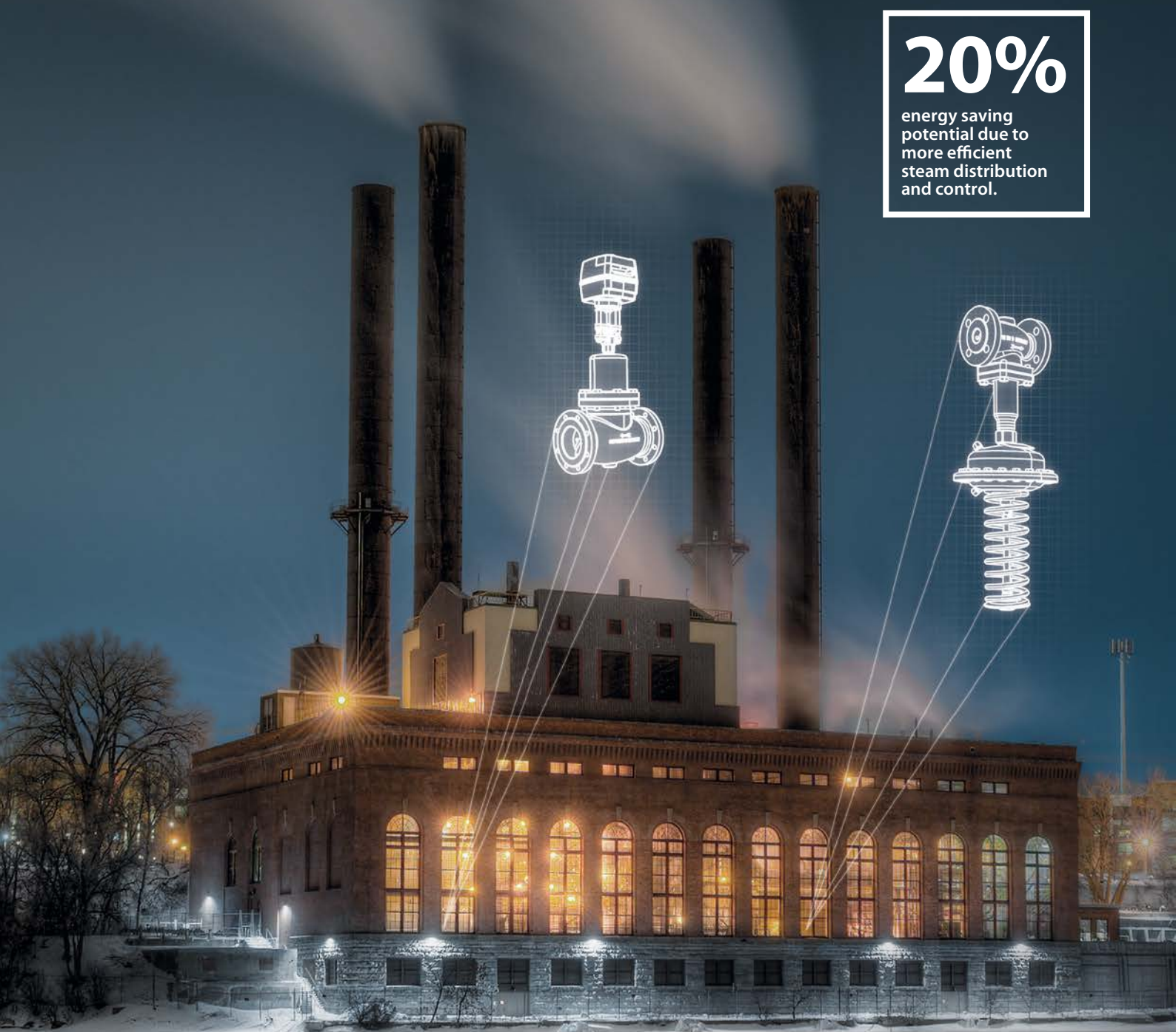
*Danfoss*

Danfoss steam valves

# Save energy with efficient and safe steam distribution

**20%**

energy saving  
potential due to  
more efficient  
steam distribution  
and control.



[heating.danfoss.com](http://heating.danfoss.com)

# Safe and efficient steam control

Would you like to improve the performance of your industrial process, steam based room heating system or domestic hot water heating?

**If so, the use of Danfoss components for steam will make your application 100% safe and under control.**

Steam as an energy source plays an important role as an efficient energy carrier, especially in industrial environments. Furthermore, the same steam is often used for hot water preparation or space heating.

When working with steam and high temperatures, safety and efficient steam control is essential. Therefore, Danfoss is delighted to offer control components specially designed to the highest standards of control and safety.

Various products for pressure, flow, and temperature control, such as self-acting pressure reducing controllers and motorized control valves, can be used for different steam applications:

- Steam pressure control in boiler houses
- Steam reduction in distribution network
- Temperature control of district energy networks and heat transfer stations – efficient space heating and drinking water preparation
- Temperature and pressure control in various industrial applications



## Benefits of Danfoss steam controllers:

- Robust design, directly operated – longer lifetime, low maintenance costs
- Resistant to wet and dirty steam
- Large capacity – big size controllers
- High flexibility due to the threaded and flanged versions
- Easy to install and commission

Pressure reducer  
AVDS



2-way seated valve VFS  
combined with AMV 25





# Typical applications

## Steam pressure reduction

One of the main reasons for reducing the steam supply pressure is due to the maximum allowable pressure limitation on pipelines and installed equipment. If maximum allowable pressure of installed equipment is lower than the steam supply pressure, pressure must be reduced accordingly; thus safe working pressure in supply line is not exceeded (Fig. 1).

Other positive impacts from pressure reduction:

- **Energy savings**

Due to the reduced condensing pressures at the point of use, return temperature will be lower, which will reduce standing losses.

- **Lower investment costs**

Due to the use of low pressure heat exchangers, the investment costs are lower; despite slightly bigger dimensions they are usually less expensive because of lower design specifications.

- **Constant steam supply**

Many plants use steam at different pressures. To save the energy, the high pressure condensate from one process is flashed to steam for use in another process. In such „stage“ system, pressure reducer ensures constant steam supply in low pressure system at times when not enough flash steam is being generated.

Fig. 1

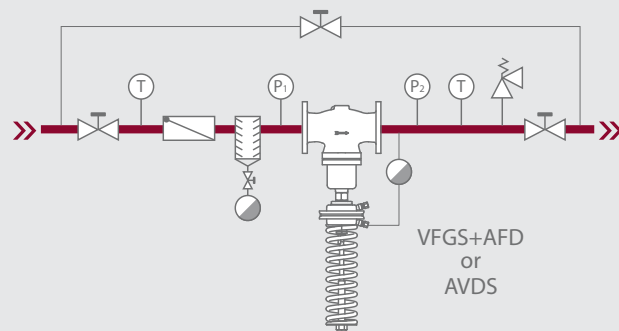


Fig. 2

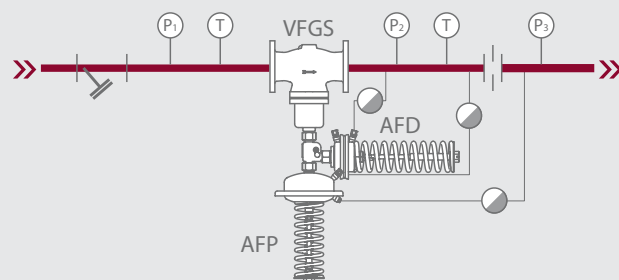
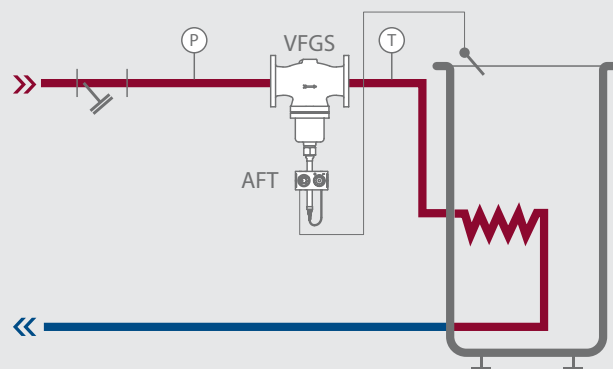


Fig. 3



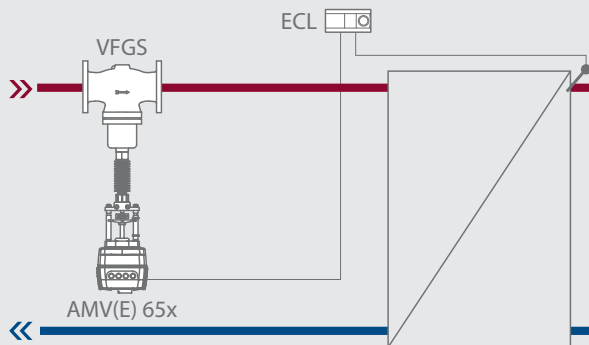


Fig. 4

### Pressure reduction and flow control

Combined pressure control and flow limitation e.g. behind the steam generator (Fig. 2).

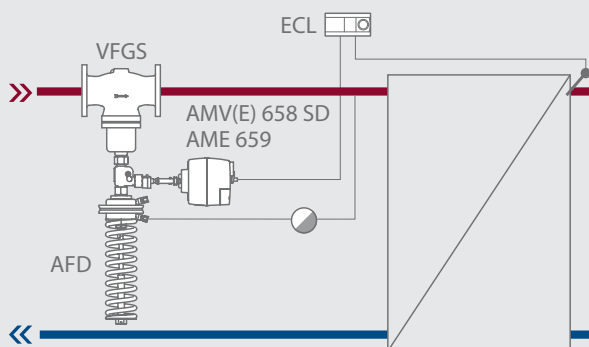


Fig. 5

### Temperature control in various industrial processes

Applications like drying ovens, sterilisers, and electrolytic baths (Fig. 3).

### Temperature control in district heating substation

Temperature control in heat exchanger used in district heating substations for indirect sanitary water preparation or space heating (Fig. 4).

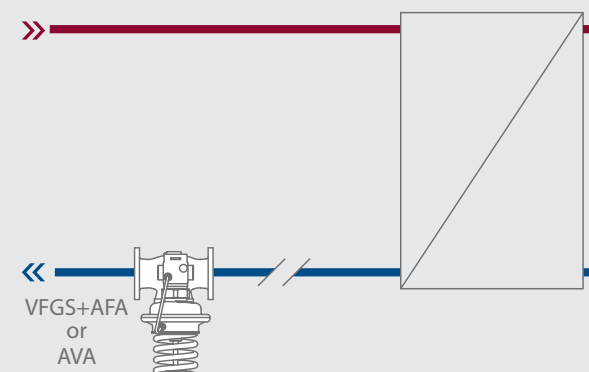


Fig. 6

### Safety pressure control

In the event that the pressure reduction equipment fails, safety control components should also be implemented in the system.

Safety steam controller, which consists of valve (VFGS), electric actuator (AMV/E 658 SD, AME 659 SD), pressure reducer (AFD) and combination piece (KF 3), can prevent the secondary side of the system against overheating in case of failure (Fig. 5).

To maintain the pressure on condensing side, AFA+VFGS or AVA controllers can be used for keeping the pressure of the condensate on desired/safe level. (Fig. 6).

# Motorized control valves

## Product range overview



### ELECTRICAL ACTUATORS

AMV(E) 655 <sup>1)</sup>



AMV(E) 658 SU/SD /  
AME 659 SD <sup>1)2)</sup>




AMV(E) 25 /  
AMV(E) 25 SU/SD <sup>3)</sup>



AMV(E) 35 <sup>3)</sup>



	AMV(E) 655 <sup>1)</sup>	AMV(E) 658 SU/SD / AME 659 SD <sup>1)2)</sup>	AMV(E) 25 / AMV(E) 25 SU/SD <sup>3)</sup>	AMV(E) 35 <sup>3)</sup>
Voltage 24 V	AC/DC	AC/DC	AC	AC
Voltage 230 V	AC/DC	AC/DC	AC	AC
3 point control	AMV or AME	AMV or AME	AMV	AMV
Modulating control	AME	AME	AME	AME
Safety function	no	yes	yes (SU/SD)	no
Speed (s/mm)	2 or 6	2 or 6	11 / 15	3
Force / torque	2000 N	2000 N	1000 N / 450 N	600 N

CONTROL VALVES	Type	PN (bar)	Temp. (°C)	Ports	DN	Stroke (mm)	Kvs / Q (m <sup>3</sup> /h)	Max ΔP <sup>4)</sup> (bar)			
	VFS 2		25	2(-10)-200 <sup>5)</sup>	2	15-100	15-40	0,4-145	1,5-4,5 (DN65-100)	1,5-4,5 (DN65-100)	AMV(E) 25: 3-25 (DN15-50) AMV(E) 25 SU/SD: 0,5-22 (DN15-50)

1) For temperatures > 120°C electric actuators must be installed (oriented) downwards. See installation instructions/data sheets.

2) AME 659 SD – with safety function DIN EN 14597 certified.

3) Electric actuators must be installed (oriented) according to installation instructions/data sheets.

4) This is a general overview. For detailed ΔP over different DN's see datasheet.

5) With accessory, max. temperature up to 200°C / 350°C. See accessories table.



6) AFD+VFGS and AVDS should be mounted before the control valve (flow mounting). See instructions/data sheet.



7) Valve and pressure actuator/thermostat need to be ordered separately.


8) VFGS 2 - Standard version / VFGS 2-X - Special version with grooved flanges (market specific-CPCU France).






# Pressure reducers, pressure relief controllers and thermostats

## Product range overview

	Type	PN (bar)	Temp. (°C)	Setting range of p-reduction (bar)	DN	Max ΔP (bar)	Kvs / Q (m³/h)
PRESSURE REDUCERS	<b>AVDS <sup>6)</sup></b> 	25	2-200	1.0-12	15-25	10	1.0-6.3
	<b>AFD + VFGS 2 <sup>6)</sup> 7) 8)</b> 	16 / 25 / 40	2-350 <sup>5)</sup>	0.05-16	15-250	10-20	4.0-400

	Type	PN (bar)	Temp. (°C)	Setting range of p-reduction (bar)	DN	Max ΔP (bar)	Kvs / Q (m³/h)
PRESSURE RELIEF CONTROLLERS	<b>AVA</b> 	25	2-150	1.0-11	15-50	16-20	4.0-25
	<b>AFA + VFGS 2 <sup>7) 8)</sup></b> 	16 / 25 / 40	2-350 <sup>5)</sup>	0.05-16	15-250	10-20	4.0-400

	Type	PN (bar)	Temp. (°C)	Setpoint (°C)	DN	Max ΔP (bar)	Kvs / Q (m³/h)
THERMOSTAT	<b>AFT06(17)+VFGS 2 <sup>7) 8)</sup></b> 	16 / 25 / 40	2-200 <sup>5)</sup>	-20...180 (130)	15-125	15-20	4.0-160

	Type	Point of use
ACCESSORIES	 <b>Combination piece KF3</b>	For more additional functions - combination with pressure and electric actuators
	 <b>Valve extension ZF4, ZF5</b>	For combination with VFGS valves DN 15-125. ZF 4 for temperatures up to 200°C, ZF 5 for temperatures up to 350°C
	 <b>Valve extension D40</b>	For combination with VFGS valves DN 125-250. For temperatures up to 200°C
	 <b>Flow divider for VFGS valves DN 15-250</b>	For noise reduction (in case of high differential pressures)
	 <b>Adapter 065B3527</b>	For combination of VFGS valve and electric actuator AMV(E) 65x
	<b>Adapter 065Z7548</b>	For combination of AMV(E) 25(SU/SD), AMV(E)35 and VFS 2 DN 15-50 for temperatures up to 200°C

**Note:** The product range available may vary for certain markets. This is a general overview. For detailed data, see product datasheets. Accessories, can be found in data sheets of actuators and valves. Besides single components for steam applications, Danfoss can provide also complete solution – subscriber station for different steam applications.

# 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.



Find more information at [www.heating.danfoss.com](http://www.heating.danfoss.com)

# Danfoss offers consultancy of component selection, design and supply of substations

## SUBSTATIONS

Need a design of a station and optimization of heating installations? Just send us your heating demand, design temperature, design pressures, space requirements and all other relevant information.



## CONTROL VALVES AND PLATE HEAT EXCHANGERS

Need a component? Danfoss is the global leader supplying all control components and heat exchangers for District Energy. Danfoss supports your choice of the optimal component for your application.



## AUTOMATIC CONTROLS AND SCADA

Need automatic controls and communication? Accurate control of substations is a precondition for perfect indoor climate and reduced energy costs. Danfoss automatic controller ECL provides that, and offers external communication possibilities. Furthermore, Danfoss offers a web-based SCADA solution called ECL portal. This portal enables remote monitoring and control of the substation.



**Danfoss A/S** · Heating Segment · 6430 Nordborg · Denmark  
Tel.: +45 74 88 22 22 · Email: [heating@danfoss.com](mailto:heating@danfoss.com) · [www.heating.danfoss.com](http://www.heating.danfoss.com)

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.