



MAKING MODERN LIVING POSSIBLE



## A partner you can trust

With more than 60 years of experience, Danfoss Industrial Automation has acquired unparalleled knowledge of technologies and applications. This experience has given us a leadership position within our key technologies of pressure sensors and controls, temperature sensors and controls, fluid controls and motor starters.

Thanks to the scope of our product range, we can often deliver what might be termed 'special configurations' directly from stock, saving you time and money. Where necessary, we can modify products to your specifications or, where the specifications do not yet exist, we'll help you define them. Serving a broad, global market within diverse and demanding industries, Industrial Automation is your one-stop partner for industrial control components and systems.

Through Danfoss Industrial Automation, you gain access to the entire Danfoss pool of technology.

## One call to Danfoss and you're in control

Danfoss Industrial Automation offers you easy access to one of the widest ranges of quality industrial controls available, including:

- Solenoid valves
- Externally-operated valves
- Thermostatically-operated valves
- Electro-mechanical contactors
- Electronic contactors and motor controllers
- Pressure and temperature switches
- Pressure transmitters
- Temperature sensors and transmitters

More and more customers are turning to us to improve productivity and reduce costs through our combination of value-added services and product line competencies. Our specialists will be happy to advise you on product selection and configuration to meet your specific needs.



## Danfoss controls

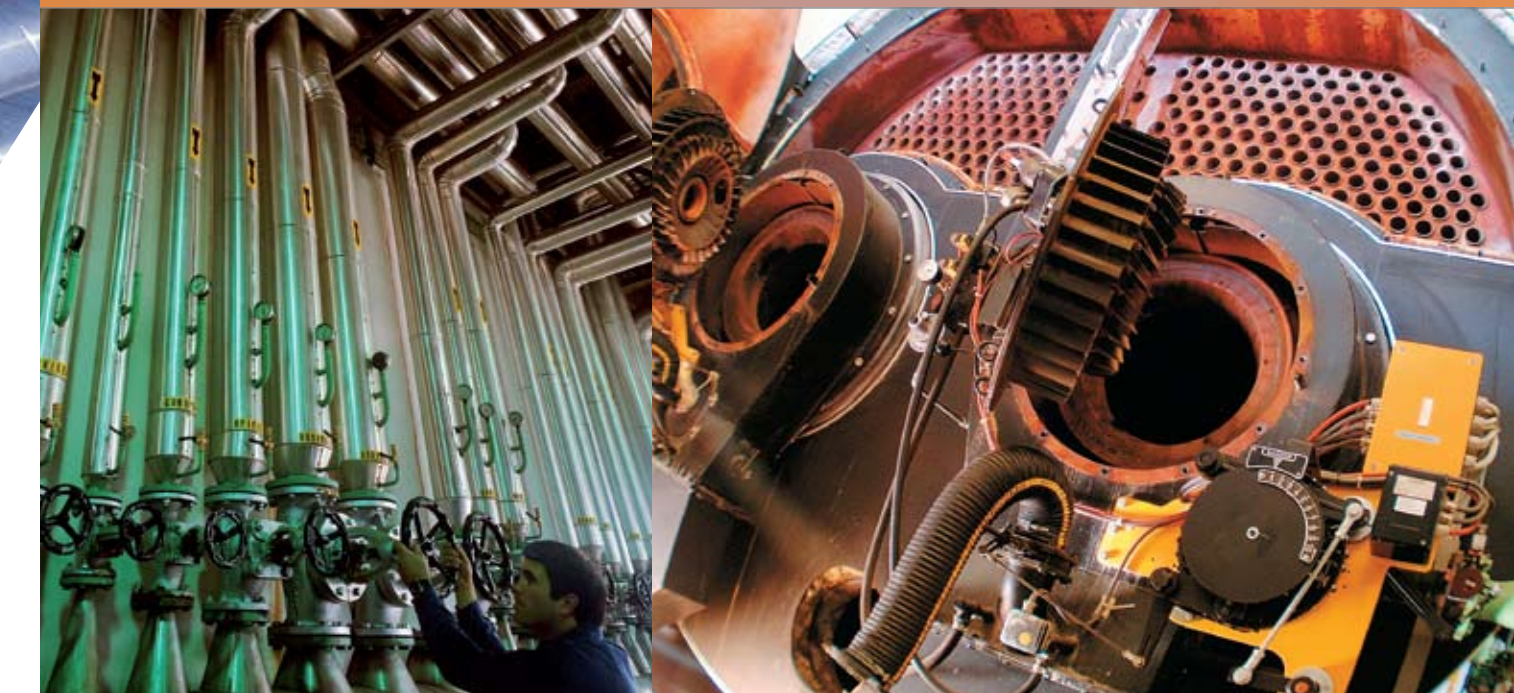
### – tailored for use in hazardous areas

In Ex areas, where people's lives and high-value materials are at stake, safety, robustness and reliability requirements leave no room for compromise.

By working in partnership with Danfoss Industrial Automation, you can be confident that you will get precisely the controls needed to achieve optimum safety.

Our comprehensive range of intrinsically safe solenoid valves, switches, pressure transmitters and temperature sensors is designed and approved to be used in environments where there is a danger of explosion. Our products cover countless applications within the heating, marine & engine, hydraulic and vacuum industries.

## Tough controls for tough environments



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 subsequent 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.

IC.PB.DIC.J1.02 / 520B3127

Danfoss A/S, IA-MC, November 2007/ht

INDUSTRIAL AUTOMATION





## Solenoid valves

Danfoss solenoid valves are designed for explosion-risk environments; i.e., where flammable liquids and gasses are produced, transported or tapped.

They are delivered as a part programme, with a separate valve and coil, and can be quickly and simply assembled without tools, providing optimum product flexibility and availability.



**Approval**

Approved for use in Zone 1 in accordance with directive 94/9/EC (ATEX 100A) EN50014 and EN50028.

### Coils for Solenoid valves

Compatibility for Valve type	Power consumption holding	Coil type	Supply voltage Volt	Code No.
All B-series valves (see below)	10W 21 VA	BO024C	24V50/60 Hz	018Z6595
		BO048C	48V50/60 Hz	018Z6594
		BO110C	110V50/60 Hz	018Z6593
		BO230C	230V50/60 Hz	018Z6592
		BO240C	240V50/60Hz	018Z6591
		BO024D	24 dc	018Z6596
	10W 16W	BP024D	24 dc with 3 m cable	018Z6633

Suitable Valve Body for Eex approved coils: (see data sheets for further details)

Direct-operated: 2/2-ways: EV210B DN 1.5 - 25B, EV210B DN 1.5 - 35S, EV212B DN 1.5 - 35S, 3/2 way: EV310B DN 1.5 - 2B  
 Servo-operated: 2/2-ways: EV220B DN 6 - 22B/DN 6 - 22BD, EV220B DN15 - 50B/DN 65 - 100C, EV220B DN 6 - 50B/DN 15 - 50SS, EV222B DN 15 - 50, EV250B DN 12 - 22B



## Switches

The Danfoss RT-E series, pressure, differential pressure and temperature switches, are designated for industrial refrigeration and general industrial application in explosive zones. The range includes solutions for refrigeration systems with ammonia, hydrocarbons and other applications where flammable gases, vapours, mists and dust are likely to occur.

RT-E pressure and temperature switches for use in explosive zones incorporate an SPDT changeover switch, where contact position depends on the pressure or temperature values of the system.

**Approval**

Approved in accordance with 94/9/EC, ATEX directive, explosive zone 1, for surface equipment, category 2.



### Pressure Switches (as standard connection G3/8A and with auto reset)

Type	Range	Differential	Max. working pressure	Code no.
RT 112E	0.1 to 1.1 bar	0.07 to 0.16 bar	7 bar	017-518566
RT 113E	0 to 0.3 bar	0.01 to 0.05 bar	0.4 bar	017-519566
RT 1AE	-0.8 to 5 bar	0.5 to 1.6 bar bar	22 bar	017-500966*
RT 116E	1 to 10 bar	0.3 to 1.3 bar	22 bar	017-520166
RT 5E	4 to 17 bar	1.2 to 4 bar	22 bar	017-525266
RT 6AEW	5 to 25 bar	fixed 3 bar	34 bar	017-513866*
RT 6 AEB Man. reset	10 to 28 bar	fixed 1.5 bar	34 bar	017-513466*
RT 6AES Man. reset	10 to 28 bar	fixed 1.5 bar	34 bar	017-522166*
RT 117E	10 to 30 bar	1 to 4 bar	42 bar	017-529866

\* with welded nipple Ø6.5/10 mm

### Differential Pressure Switches (as standard connection G3/8A and with welded nipple Ø6.5/10 mm)

Type	Range	Differential	Max. working pressure	Code no:
RT 260AE	0.5 to 4 °C	fixed 0.3 bar	22 bar	017D003666
RT 262AE	0.1 to 1.5 °C	fixed 0.1 bar	11 bar	017D003066

### Temperature Switches (as standard with 2 m capillary tube)

Type	Range	Type of charge	Max. sensor temp.	Code no:
RT 14E	5-30 °C	B	150 °C	017-509866
RT 101E	25-90 °C	B	300 °C	017-512666
RT 107E	70-150 °C	C	215 °C	017-515366
RT 123E	150-250 °C	C	300 °C	017-521666

Type of charge: B = Adsorption, C = Partial

## Pressure Transmitters

Our Eex pressure transmitter programme offers reliable pressure measurement, even in harsh and demanding applications. It covers a 4-20 mA output signal, absolute and gauge (relative) versions, measuring ranges from 0-1 to 0-600 bar, and zero point and span adjustment with a wide range of pressure connections. Some models are also available with integrated pulse snubber for protection against cavitation, liquid hammer or pressure peaks.

**Approval**

EEx ia IIC T6 explosion protected in accordance with ATEX 100a.



## Temperature sensors and transmitters

Danfoss temperature sensors are designed for heavy-duty applications and are based upon decades of global experience within the marine industry and in refrigeration plants - among the toughest environments.

The range includes different versions with measuring ranges from -50°C to 800°C.

MBT 5113 and MBT 5116 for measuring and regulating exhaust gas in stationary and marine equipment like diesel engines, turbines and compressors, among others.

MBT 5250 and MBT 5252 for measuring and regulating temperature in piping systems and refrigeration plant on ships - or at all points where reliable, robust and accurate equipment is required.

These temperature sensors include Pt-sensing elements which are passive components and therefore classified as a simple apparatus. As such they cannot be approved according to the ATEX directive.

**Approval**

Included in the Danfoss programme is the temperature transmitter, MBT 9110, which is a terminal block version in accordance with the ATEX directive.



### Temperature transmitter MBT 9110, EEx approval:

KEMA 03ATEX1339 X Ex II 1 G D, T80°C T105°C

EEx ia IIC T6 / T4

Max. amb. temperature for T1...T4 85°C

Max. amb. temperature for T5 and T6 60°C

ATEX, applicable in zone

0, 1, 2, 20, 21 or 22

The EEx approved transmitter can be used together with our temperature sensors if certain measures are taken.

### Ex installation

For safe installation of MBT 9110 transmitters in hazardous areas, the following points must be observed:

- The module must only be installed by qualified personnel who are familiar with national and international laws, directives and standards that apply.
- The transmitter is approved to be mounted in a metal enclosure Form B according to DIN 43729 that is providing a degree of ingress protection of at least IP 6X in accordance with EN 60529.
- The ATEX transmitter can be mounted in the standard B-head or in a heightened lid, but only the transmitter is ATEX approved and marked according to this.