ENGINEERING
TOMORROW

Brochure| Controls

Tough controls for tough environments

Danfoss controls - designed and approved for hazardous areas

sensors.danfoss.com

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 Sensing Solutions, 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 and hydraulic industries.

A **partner** you can **trust**

With more than 75 years of experience, Danfoss Sensing Solutions 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 as well as fluid controls.

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.

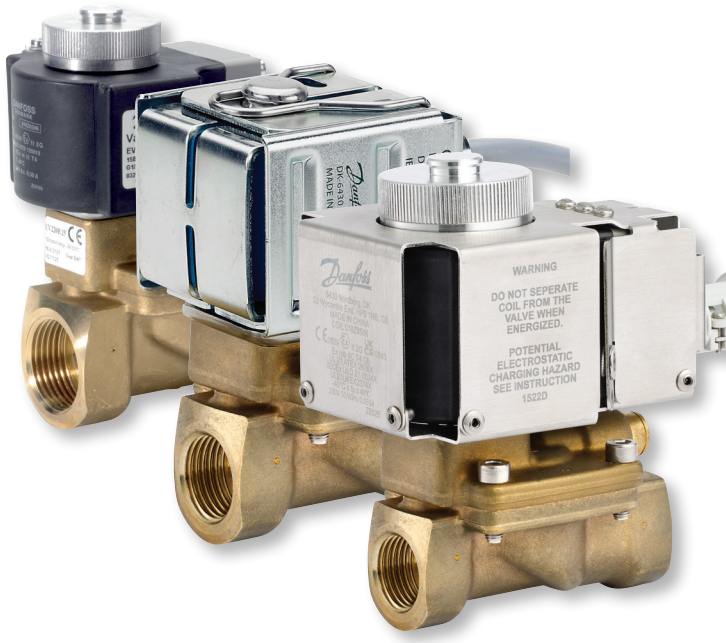
Serving a broad, global market within diverse and demanding industries, Danfoss is your one-stop partner for industrial control components and systems.

Through Danfoss Sensing Solutions, you gain access to the entire Danfoss pool of technology.

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 quickly and easily be assembled without tools, providing optimum product flexibility and availability.



Approval

Approved for use in Zone 1 in accordance with directive Atex 2014/34/EU

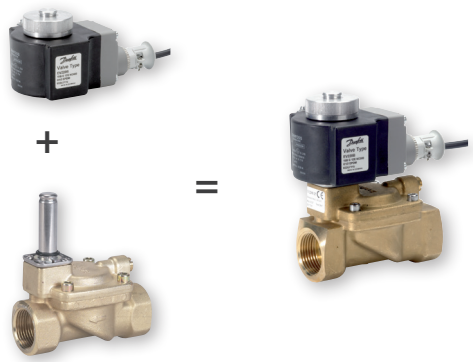
Type BO, coils for Solenoid valves

ATEX (ECEX) 2014/34/EU

- *EX MB IIC T4 GB*
- *ITS 09 ATEX 16835X*

Compatibility for Valve type	Power consumption holding	Coil type	Supply voltage Volt	Code No.
EV2XXB 1,5-6 NO/NC	10W 21 VA	**BO024C**	24V50/60 Hz	018Z6595
		BO110C	110V50/60 Hz	018Z6593
		BO230C	230V50/60 Hz	018Z6592
		BO240C	240V50/60Hz	018Z6591
	10W	**BO024D**	24 DC	018Z6596

Type BO will be replaced in 2023 by type BI

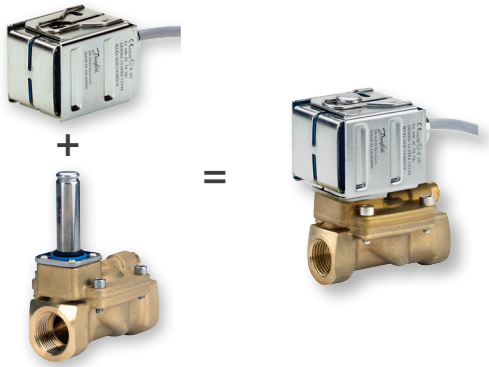


Type BZ, coils for Solenoid valves

ATEX (IECEX) 2014/34/EU

- *EX MB IIC T4 GB*
- *DEMCO 14 ATEX 1314X*
- *IECEX ULD 14.0001X*

Compatibility for Valve type	Power consumption holding	Coil type	Supply voltage Volt	Code No.
EV2XXB 6-100 NO/NC	8,6W	**BZ120C**	110V 50Hz	018F4703
	9,0W	**BZ120C**	120V 60 Hz	
	9,5W	**BZ240C**	230V 50 Hz	018F4704
	9,0W	**BZ240C**	230V 60Hz	

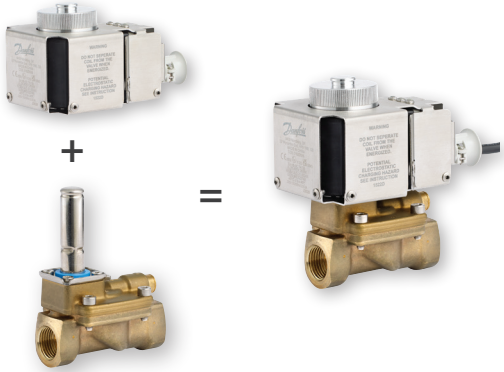


Type BI, coils for Solenoid valves

ATEX (IECEX) 2014/34/EU

- *EX MB IIC T4 GB*
- *CE 0539 (EX LOGO) II 2G*
- *UKCA 0843 (EX LOGO) II 2G*

Compatibility for Valve type	Power consumption holding	Coil type	Supply voltage Volt	Code No.
EV2XXB 1,5-6 NO/NC	10W 21 VA	**BI024C**	24V50/60 Hz	018Z8595
		BI110C	110V50/60 Hz	018Z8593
		BI230C	230V50/60 Hz	018Z8592
		BI240C	240V50/60 Hz	018Z8591
	10W	**BI024D**	24 DC	018Z8596



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 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 2014/34/EU 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	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	017-502166*
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 bar	fixed 0.3 bar	22 bar	017D003666
RT 262AE	0.1 to 1.5 bar	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 9E	-45 to -15 °C	A	150 °C	017-617866*
RT 14E	-5-30 °C	B	150 °C	017-509866
RT 14E	-5-30 °C	B	150 °C	017-617966*
RT 101E	25-90 °C	B	300 °C	017-512666
RT 101E	25-90 °C	B	300 °C	017-618066*
RT 107E	70-150 °C	C	215 °C	017-515366
RT 107E	70-150 °C	C	215 °C	017-618266*
RT 123E	150-250 °C	C	300 °C	017-521666
RT 123E	150-250 °C	C	300 °C	017-618366*

Type of charge: A= Vapour, B = Adsorption, C = Partial * *5m capillary tube*

Pressure Transmitters

Our marine and UL approved 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 with a wide range of pressure connections.
Version with integrated pulse snubber available, for protection against cavitation, liquid hammer or pressure peaks.

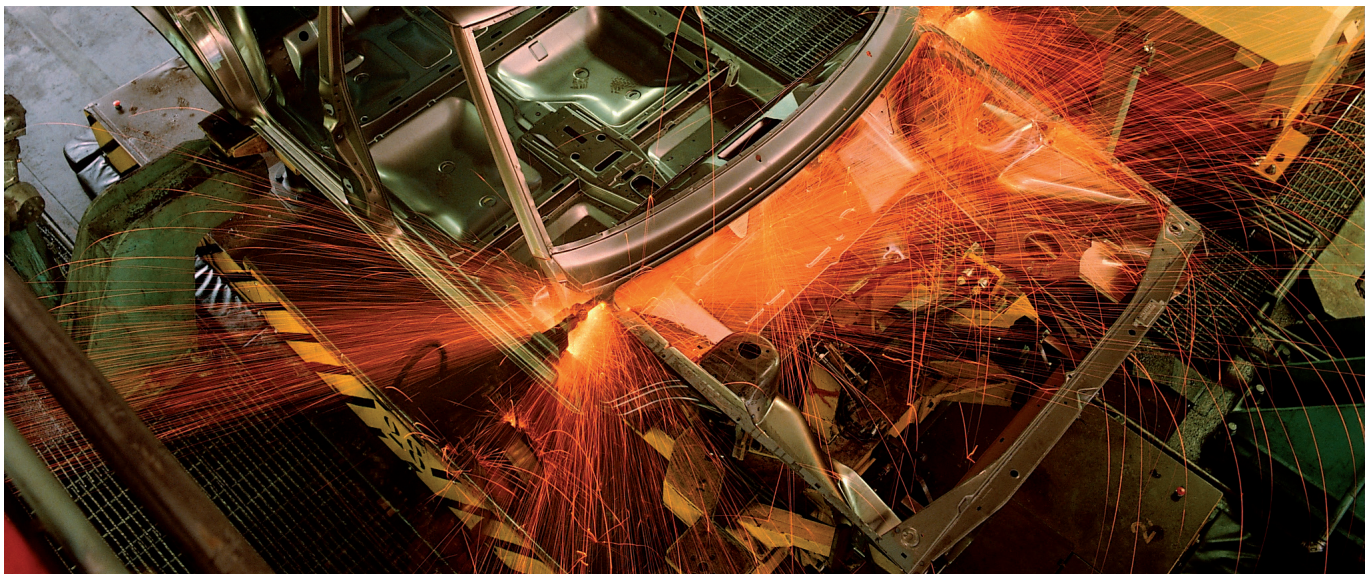
Approval

EEx ia IIC T5..T4 explosion protected in accordance with ATEX 2014/34/EU, for use in Zone 0.

Pressure Transmitters

(Pressure connection G1/2A, 4 - 20 mA output signal and with Pg9 electrical plug)

Type	Measuring range Pe (bar)	Comments	Code no.
MBS4201	0-1 bar		060G4303
MBS4201	0-1.6 bar		060G4300
MBS4201	0-2.5 bar		060G4304
MBS4201	0-4 bar		060G4305
MBS4201	0-6 bar		060G4306
MBS4201	0-10 bar		060G4307
MBS4201	0-16 bar		060G4301
MBS4201	0-25 bar		060G4308
MBS4201	0-40 bar		060G4309
MBS4201	0-60 bar		060G4302
MBS4251	0-100 bar		060G4310
MBS4251	0-160 bar	with pulse-snubber	060G4311
MBS4251	0-250 bar	with pulse-snubber	060G4312
MBS4251	0-400 bar	with pulse-snubber	060G4313
MBS4251	0-600 bar	with pulse-snubber	060G4314



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.

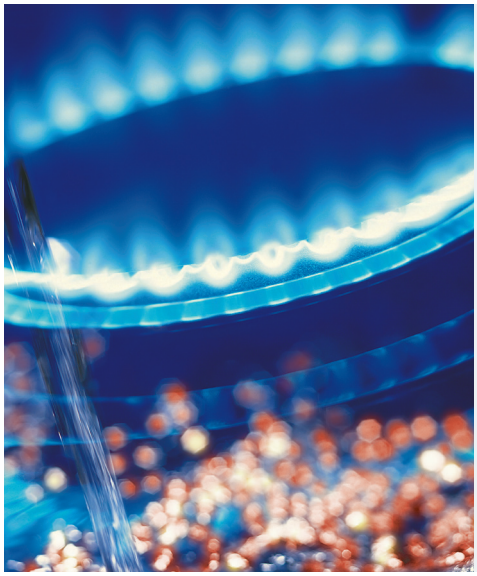
Temperature transmitter MBT 9110, EEx approval:

KEMA 03ATEX1535X 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.

Approval

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



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.

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Danfoss Ex products where people's lives and **high-value materials** are at stake, **safety, robustness** and **reliability** requirements leave no room for compromize

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