ENGINEERING
TOMORROW

Installation guide

Pressure transmitters
MBS 4201, MBS 4251

060R9360

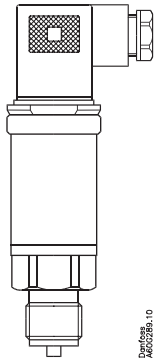
Page content

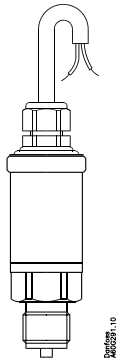
Description / Application

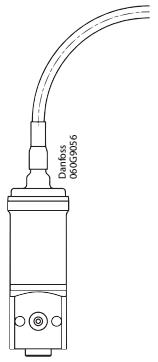
Application: Pressure measurement in potentially explosive areas.

Approval: Ex ia IIC T5...T4 Ga/Gb (MBS 42xx series) in accordance with ATEX directive 2014/34 EU.

Function: Pressure transmitters type MBS 4201, MBS 4251 convert the pressure measured to a 4 – 20 mA current signal.







Specifications

Output current	4 – 20 mA
Supply voltage	10 – 28 V DC

Safety specifications
Electrical

Max. supply voltage	Ui	28 V DC
Max. Input current	Ii	100 mA
Max. Input power	Pi	0.7 W
Internal capacity	Ci	66 nF
Internal inductance	Li	8 µH

Plug Type, MBS42x1-xxxx-Yxxxx (Y=A0, A1, A6, G9 are indicative for plug type)

Ambient temperature	T4	-40 – 100 °C
	T5	-40 – 75 °C
Media temperature	T4	-40 – 100 °C
	T5	-40 – 75 °C

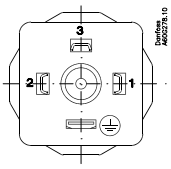
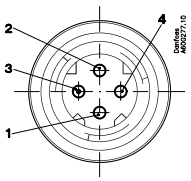
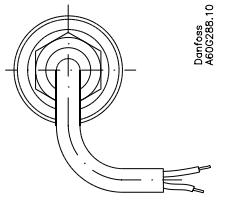
Fixed Cable Types, MBS 42x1-xxxx-Yxxxx (Y = DB, DC, J1, DF, DH are indicative cable lengths, max. 12 m)

		DB, DC, J1 PVC cable	DH, DF ETFE cable
Ambient temperature (fixed installations)	T4	-40 – 80 °C	-40 – 95 °C
	T5	-40 – 75 °C	-40 – 75 °C
Ambient temperature (cables flexed during installation or operation)	T4	-5 – 70 °C	-5 – 70 °C
	T5	-5 – 70 °C	-5 – 70 °C
Media temperature	T4	-40 – 100 °C	-40 – 100 °C
	T5	-40 – 75 °C	-40 – 75 °C

Pressure specification

Measuring range	bar	0 – 1	0 – 1.6	0 – 2.5	0 – 4	0 – 6	0 – 10	0 – 16	0 – 25	0 – 40	0 – 60	0 – 100	0 – 160	0 – 250	0 – 400	0 – 600
Overload (Static)	bar	6	12	24	24	60	60	150	150	300	360	600	1200	1500	1500	1500
Burst pressure	bar	100	100	100	100	100	100	150	150	400	800	1200	1200	2000	2000	2000

Safety Instructions

	EN 175301-803-A	Bayonet A1-3.2- ISO 15170-Sn	
			
Materials of electrical connections	Glass filled polyamid, PA 6.6	Glass filled polyester, PBT	PVC cable or ETFE
Protection	IP65	IP67 / IP69K	IP67

Safety instructions
The transmitter must always be supplied from an intrinsic safety barrier. All national safety regulations must be complied with in connection with installation, start-up and operation of Danfoss pressure transmitters type MBS 4201, MBS 4251. Furthermore, the requirements of the Declaration of Conformity and national regulations for installation in explosion areas apply. Disregarding such regulations involves a risk of serious personal injury or extensive material damage.
Work in connection with the pressure transmitters mentioned must be performed only by suitably qualified persons.

Ex requirements are fulfilled through certificates:
DEMKO 01 ATEX 127938X, IECEx ULD 12.0005X, UKEX UL22UKEX2660X

Special Ex protection instructions: In the event of damage to enclosure or diaphragm, the pressure transmitter must be replaced. The end user must ensure the installation is made in accordance to IEC/EN60079-25 and IEC/EN60079-14.

WARNING –Potential Electrostatic Charging Hazard. The transmitter must only be installed in surroundings with low wind speed, and where rubbing on the plug is unlikely. Cleaning with a damp cloth is recommended. To avoid build -up of electrostatic discharge it must be ensured the pressure connection of the pressure transmitter is having a reliable connection to earth with an impedance no exceeding 1 Gohm.
MBS transmitters contain 1.2 nF capacitance from any input terminal to earth.

Special conditions for safe use in accordance to the ATEX/IECEx certificate:
For installations in which both the Ci and Li of the connected apparatus exceeds 1% of Co and Lo parameters (excluding the cable), then 50% of Co and Lo parameters are applicable and shall not be exceeded.

WARNING –Special precautions are necessary to reduce the risk due to electro-static discharge. The transmitter must only be installed in surroundings with low wind speed, and where rubbing the plug is unlikely. Cleaning with a damp cloth is recommended.
The installation shall ensure that the resistance to earth of metallic parts of the equipment enclosure is less than 1 GOhm.
The equipment does not provide 500 V isolation to earth as required by IEC/EN60079-11: clause 6.3.13.
Installations of the pressure connection across boundary walls requiring Category 1G equipment and a less hazardous area must be gas tight as required by IEC/EN60079-26. Gaskets and seals used at the pressure connection must be suitable for use with the process medium.

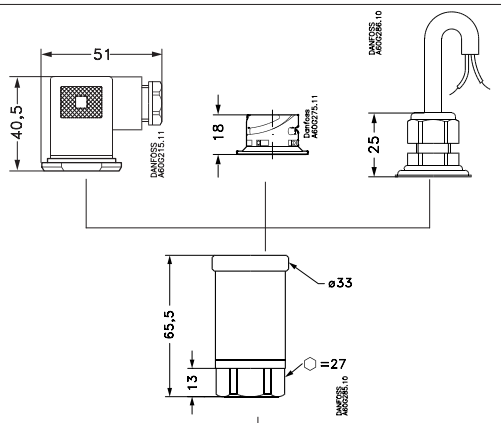
Demands on the medium:
Parts in contact with the medium are made of stainless steel, EN 1088-1 1.4404 (AISI 316L). The user is responsible for a careful analysis of all process parameters when materials have to be specified and for ensuring the process medium is neutral to stainless steel as some media can be corrosive. The end user must ensure that the process connection is gas tight (as required by IEC/EN60079-26) which may require the use of a suitable gasket/seal in combination with the process connection to obtain a gas-tight connection. Gaskets and seals used at the pressure connection, including those supplied with the transmitters, must be determined as being suitable for use with the process medium and process pressure/temperature before use and alternative gasket material chosen if necessary. The end user must ensure the transmitter pressure connection is tightened with the correct torque as required for the specific thread type.

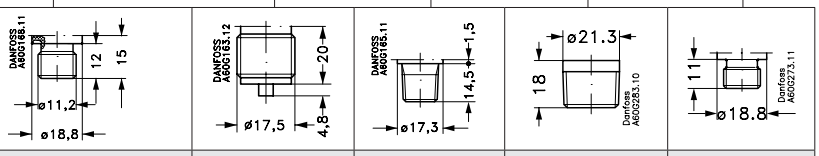
In case of problems please contact: **Danfoss A/S**
DK-6430 Nordborg
Denmark

You find the EC-Type Examination Certificate at:

Installation/dimensions

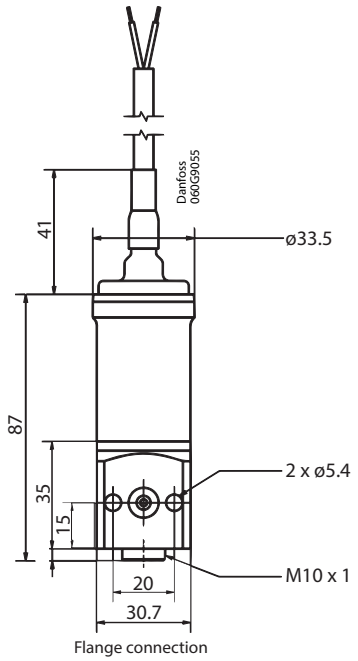
MBS 4201
MBS 4251

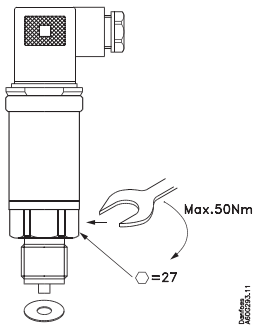




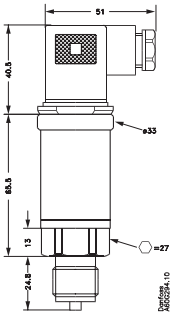
DIN3852-E-G¼ Gasket: DIN 3869-14-NBR	G½ A (EN 837)	¼ - 18 NPT	½ - 14 NPT	ISO 6149-2 M14 x 1.5-6g incl. O-ring NBR

MBS 4201
MBS 4251

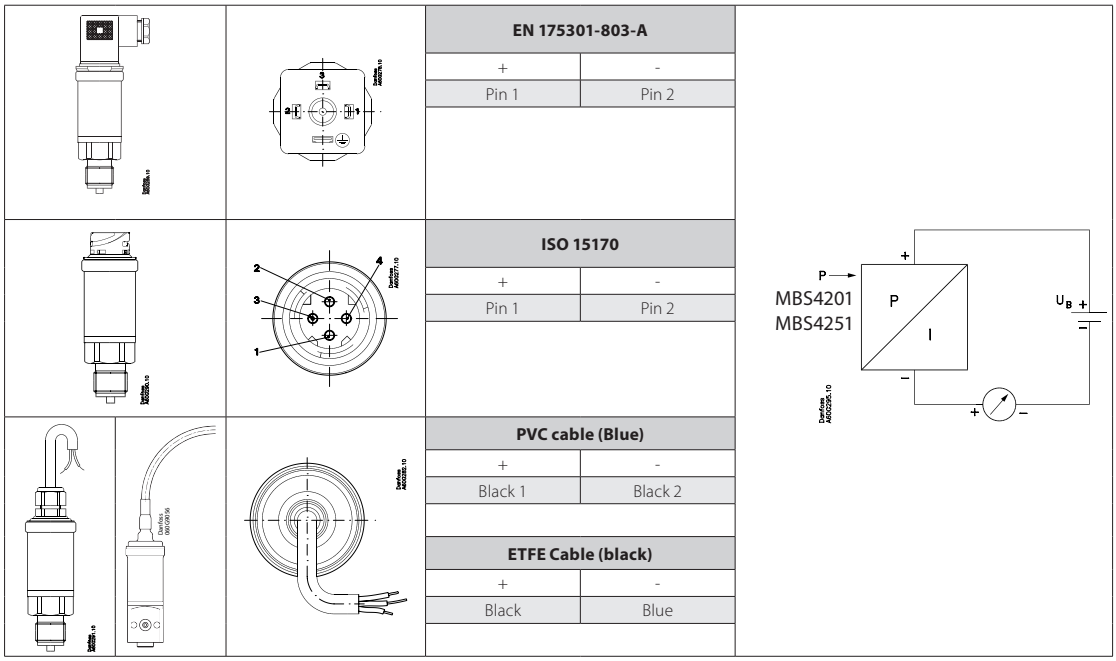




Dimensioned sketch - Example



Electrical connection



EN 175301-803-A	
+	-
Pin 1	Pin 2

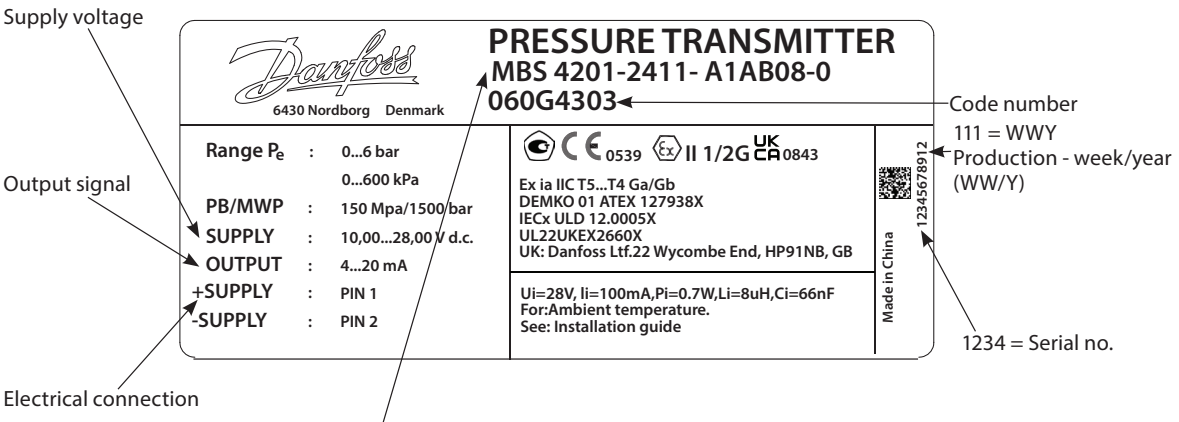
ISO 15170	
+	-
Pin 1	Pin 2

PVC cable (Blue)	
+	-
Black 1	Black 2

ETFE Cable (black)	
+	-
Black	Blue

Cables must be specified for a minimum test voltage of 500 VAC between conductor/earth, conductor/screen and screen/earth.
In addition, the total capacity and inductivity of the installation (transmitter + cable) must be taken into consideration.
In Zone 0 an intrinsically safe type Ex ia circuit must be used and national regulations for Zone 0 must be complied with. The pressure transmitter must only be used in Zone 0 at atmospheric pressure between 0.8 and 1.1 bar and at ambient temperatures between -20 and 50 °C.

Identification



Type no. (Indicates transmitter specification - see key below)

Type no.
MBS 4201-
MBS 4251-

			1	–							–	

Gasket

0	0 N0 Gasket
1	1 Gasket Viton -20 °C – 125 °C
2	2 Gasket NBR -40 °C – 85 °C
3	3 O-Ring Viton -20 °C – 125 °C
4	4 O-Ring NBR -40 °C – 125 °C

Pressure connection

G B 0 4	DIN 3852-E-G1/4, Gasket: DIN 3869-14-NBR
A B 0 8	G1/2A (EN 837)
A C 0 4	1/4-18 NPT
A C 0 8	1/2-14 NPT
F A 0 8	ISO 6149-2, M14x1.5 -6g, O-ring 11.3x2.2, NBR
D F 0 2	M10 x 1 female with flange connection

Measuring range

0 – 1 bar	10
0 – 1.6 bar	12
0 – 2.5 bar	14
0 – 4 bar	16
0 – 6 bar	18
0 – 10 bar	20
0 – 16 bar	22
0 – 25 bar	24
0 – 40 bar	26
0 – 60 bar	28
0 – 100 bar	30
0 – 160 bar	32
0 – 250 bar	34
0 – 400 bar	36
0 – 600 bar	38

Electrical connection

A0	No Plug EN 175301-803-A
A1	Plug PG9 EN 175301-803-A
A6	Plug PG11 EN 175301-803-A
G9	Plug Bayonet A1-3.2- ISO 15170-Sn
DB	Cable Screened 2m Blue PVC
DC	Cable Screened 5m Blue PVC
J1	Cable Screened 7m Blue PVC
DF	Cable Screened 12m Black ETFE Marine approved
DH	Cable Screened 6m Black ETFE Marine approved

Output signal

1	4 – 20 mA

Pressure reference

1	Gauge
2	Absolute
3	Sealed Gauge