ENGINEERING TOMORROW

Data Sheet

Pressure transmitter Type **MBS 9300**

For marine applications



Compact pressure transmitter programme, MBS 9300 gauge version is designed for use in marine applications e.g. crankcase and turbocharger filters monitoring as well as applications within level measurement.

The programme covers 4 – 20 mA and ratiometric 10-90% of supply output signals, pressure span from 40 – 400 mbar as well as bidirectional ranges.

Excellent vibration stability, robust construction, and a high degree of EMC/EMI protection equip the pressure transmitter to meet the most stringent industrial requirements.

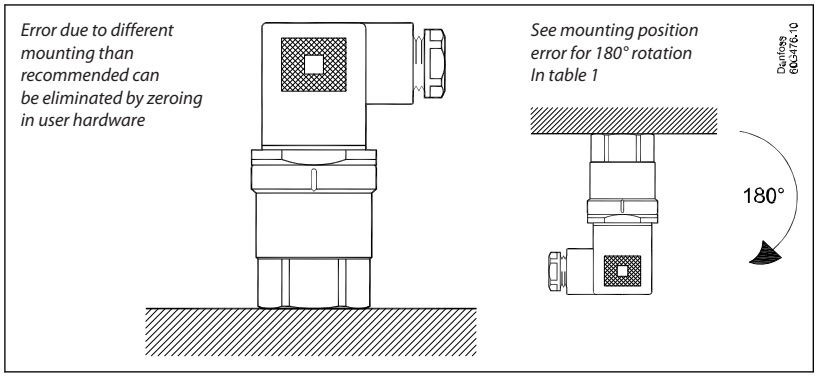
Features

- Compact design
- Full scale span from 40 – 400 mbar
  - bidirectional ranges available, e.g. -40 – 70 mbar etc.
  - lowest zero point –150 mbar
  - max full scale 250 mbar
- Digital temperature compensated
- Output signals 4-20 mA and Ratiometric 10-90% of supply
- Excellent shock and vibration robustness
- Reverse polarity protection
- With build-in clipping function and self-diagnostic features on request
- Enclosure and wetted parts of stainless steel (AISI 316L)
- EU RO Mutual Recognition
- Customer specific versions on request
- For use in Zone 2 explosive atmosphere

Applications

Recommended mounting position

Figure 1: Mounting position



Product specification

Technical specifications

Table 1: Performance (EN 60770)

Description	Value range					Units
Full-scale span (FSS) Full-Scale Span (FSS) is the difference between the upper limit and the lower limit of the pressure range. (e.g. for pressure range -30 – 30 mbar, FSS = 60 mbar.)	40	60	100/140	150	250/400	mbar
Accuracy @ 25 °C (incl. non-linearity, hysteresis and repeatability)	≤ ± 2	≤ ± 1.5	≤ ± 1	≤ ± 0.5	≤ ± 0.5	% FSS typ.
Non-linearity (BFSL)	≤ ± 0.2	≤ ± 0.2	≤ ± 0.2	≤ ± 0.2	≤ ± 0.2	% FSS
Hysteresis and repeatability	≤ ± 0.1	≤ ± 0.1	≤ ± 0.1	≤ ± 0.1	≤ ± 0.1	% FSS
Total error band (TEB) within compensated temperature range	≤ ± 5	≤ ± 3	≤ ± 2	≤ ± 1.5	≤ ± 1.5	% FSS
Mounting position error for 180° rotation	≤ ± 1.25	≤ ± 0.8	≤ ± 0.5	≤ ± 0.35	≤ ± 0.2	% FSS
Overload pressure (static)	3.5	3.5	3.5	3.5	3.5	bar
Burst pressure	50	50	50	50	50	bar
Response time				< 2 ms		
Resolution				Infinite		
Durability P: 10 – 90% FS				10×10^6 pressure cycles		

Table 2: Electrical specifications

Nom. output signal (short circuit protected)	4 – 20 mA	Ratiometric 10-90% supply
Supply voltage [U_B], reverse polarity protected	9 – 32 V DC	5 V DC +/- 10%
Supply voltage dependency	< ± 0.05% FSS / 10 V	-
Load [R_L] (load connected to 0 V)	$R_L \leq (U_B - 8\ V) / 0.02\ A$	$R_L \geq 1.5\ k\Omega$
Supply current consumption	-	≤ 6 mA
Sink / Source	-	3.3 mA
Output impedance	-	≤ 25 Ω

Table 3: Environmental specifications

Media temperature range	FPM gasket	-20 °C – 100 °C
	NBR gasket	-25 °C – 85 °C
Ambient temperature range		See Electrical connection
Compensated temperature range		0 °C – 80 °C
Transport / storage temperature range		-40 °C – 125 °C
EMC - Emission		EN 61000-6-3 and EN61236-1
EMC Immunity		EN 61000-6-2 and EN61236-1

Vibration stability	Sinusoidal	15.9 mm-pp, 2 Hz – 25 Hz	IEC 60068-2-6
		20 g, 25 Hz – 2 kHz	
	Random	7.5 g_{rms}, 5 Hz – 1 kHz	IEC 60068-2-64
Shock resistance	Shock	500 g / 1 ms	IEC 60068-2-27
	Free fall	1 m	IEC 60068-2-32
Enclosure (depending on electrical connection)			See Electrical connection

Table 4: Explosive atmospheres

Zone 2 applications[1]	CE Ex II 3G Ex nA IIA T3 Gc -10 °C < Ta < + 85 °C	EN60079-0; EN60079-15

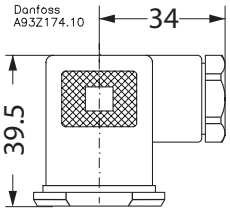
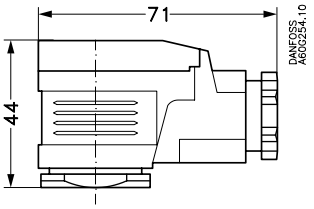
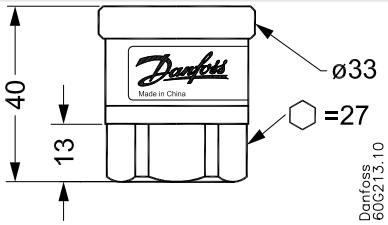
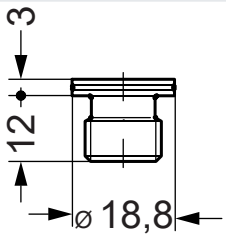
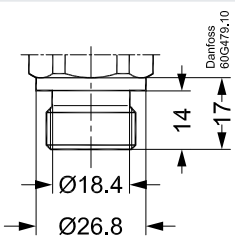
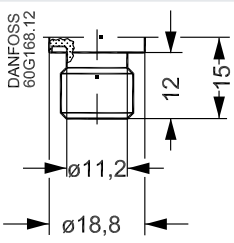
[1] When used in ATEX Zone 2 areas at low temperatures the cable and plug must be protected against impact.

Table 5: Mechanical specifications

Net weight	0.2 – 0.3 kg
Electrical connector	See Electrical connection
Pressure connection	See Electrical connection
Materials, wetted parts	EN 10088; 1.4404 (AISI 316 L)

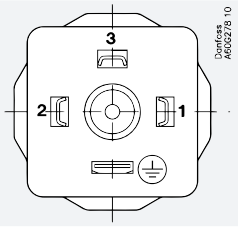
Dimensions / Combinations

Table 6: Connections dimensions / combinations

Type code: Electrical connection	A1	A6	A9
	EN 175301-803-A, Pg 9	EN 175301-803-A, Pg 11	EN 175301-803-A, Pg 13.5
		
		
			
Type code: Pressure connection	DIN 3852-E, M14x1.5	DIN 3852-E, G½	DIN 3852-E, G¼
Recommended torque:	20 – 25 Nm		

Electrical connection

Table 7: Electrical connection

Type code	A0, A1, A6 and A9
	EN 175301-803-A
	
Ambient temperature	-25 °C – 100 °C (ATEX zone 2 = -10 °C – 85 °C)
Enclosure	IP65
Materials	Glass filled polyamid, PA 6.6
Electrical connection 4-20 mA (2 wire)	Pin 1: + supply Pin 2: - supply Pin 3: Not used Earth: Connected to transmitter enclosure
Electrical connection Ratiometric 10-90% supply	Pin 1: + supply Pin 2: - common Pin 3: Output Earth: Connected to transmitter enclosure

For proper ventilation of atmospheric reference pressure a vented cable is recommended.

Ordering

Type 9300 | | | 1 | | – | | | | | | | |

Pressure range

-20 – 20 mbar	A 1
-30 – 30 mbar	A 2
-70 – 70 mbar	A 3
0 – 40 mbar	B 1
0 – 60 mbar	B 2
0 – 100 mbar	B 3
0 – 150 mbar	B 4
0 – 250 mbar	B 5

Pressure reference

Gauge (relative)	1

Output signal

4 - 20 mA	1
Ratiometric 10 - 90% of supply	6

Gasket

1	Gasket, FPM
2	Gasket, NBR

Pressure connection

G B 0 8	DIN 3852-E-G1/2, gasket DIN 3869-21
G B 0 4	DIN 3852-E-G1/4, gasket DIN 3869-14
F A 0 9	DIN 3852-E-M14 x1.5, gasket DIN 3869-14

Electrical connection

A 0	No plug (EN175301-803-A)
A 1	Plug Pg 9 (EN 175301-803-A)
A 6	Plug Pg 11 (EN175301-803-A)
A 9	Plug Pg 13.5 (EN175301-803-A)

Non-standard build-up codes on request. However, minimum order quantities may apply.
Please contact your Danfoss officer for further information.

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 8: Certificates and declarations

File name	Document type	Document topic	Approval authority
064G9615.06	EU Declaration	ATEX/EMCD/RoHS	Danfoss
TAA00000W0	Marine - Safety Certificate	-	DNV GL
ELE-311018XG	Marine - Safety Certificate	-	RINA
08472-D0 BV	Marine - Safety Certificate	-	BV
20-LD1952235-PDA	Marine - Safety Certificate	-	ABS
HTS-ETS 39049-19	Marine - Safety Certificate	-	LR
CPH 04967-AE006	Marine - Safety Certificate	-	KR
MRA000001Z	Marine - Safety Certificate	EU RO Mutual Recognition	DNV GL
E311982	Electrical - Safety Certificate	-	UL
E227388	Explosive - Safety Certificate	Hazardous Locations	UL
064R9402.00	Manufacturers Declaration	PED	Danfoss
064R9401.00	Manufacturers Declaration	China RoHS	Danfoss
SMS.W.II-2179-B.0	Marine - Manufacturing Permission	-	BV
B-BK-60210-1170_19	Food and Health - Performance Certificate	-	PZH

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