

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.

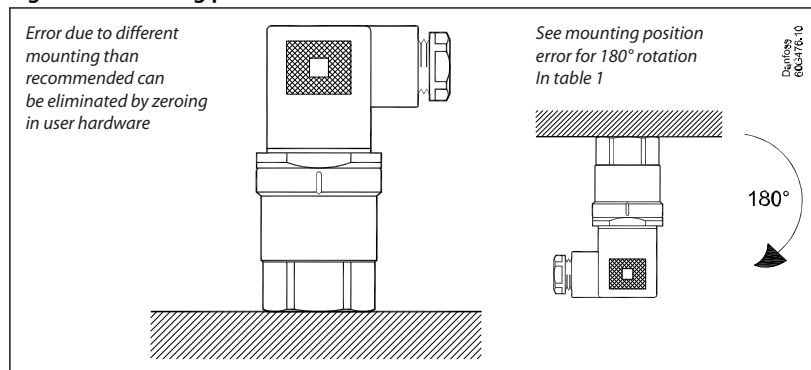
### Features

- 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 <sup>6</sup> pressure cycles

Table 2: Electrical specifications

Nom. output signal (short circuit protected)	4 – 20 mA	Ratiometric 10-90% supply
Supply voltage [U <sub>g</sub> ], reverse polarity protected	9 – 32 V DC	5 V DC +/- 10%
Supply voltage dependency	< ± 0.05% FSS / 10 V	-
Load [R <sub>L</sub> ] (load connected to 0 V)	R <sub>L</sub> ≤ (U <sub>g</sub> - 8 V) / 0.02 A	R <sub>L</sub> ≥ 1.5 kΩ
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 <a href="#">Electrical connection</a>	
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	

## Pressure transmitter, type MBS 9300

Vibration stability	Sinusoidal	15.9 mm-pp, 2 Hz – 25 Hz 20 g, 25 Hz – 2 kHz	IEC 60068-2-6
	Random	7.5 g <sub>rms</sub> , 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 <a href="#">Electrical connection</a>

**Table 4: Explosive atmospheres**

Zone 2 applications <sup>(1)</sup>		EN60079-0; EN60079-15
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<sup>(1)</sup> 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 <a href="#">Electrical connection</a>
Pressure connection	See <a href="#">Electrical connection</a>
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
<b>Type code:</b> 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																	
<b>Pressure range</b>	<table border="1"> <tr><td>-20 – 20 mbar</td><td>A 1</td></tr> <tr><td>-30 – 30 mbar</td><td>A 2</td></tr> <tr><td>-70 – 70 mbar</td><td>A 3</td></tr> <tr><td>0 – 40 mbar</td><td>B 1</td></tr> <tr><td>0 – 60 mbar</td><td>B 2</td></tr> <tr><td>0 – 100 mbar</td><td>B 3</td></tr> <tr><td>0 – 150 mbar</td><td>B 4</td></tr> <tr><td>0 – 250 mbar</td><td>B 5</td></tr> </table>	-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
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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.

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**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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