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Data Sheet

Pressure transmitter Type **MBS 33M**

For high accuracy marine applications



The high accuracy transmitter MBS 33M is designed for use in almost all marine applications, and offers a reliable pressure measurement, even under harsh environmental conditions.

The flexible pressure transmitter programme covers a 4 – 20 mA output signal, absolute or gauge (relative) versions, measuring ranges from 0 – 1 to 0 – 600 bar. A wide range of pressure and electrical connections.

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

Features

- Designed for use in severe maritime environments
- All relevant marine approvals
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- Pressure ranges in relative (gauge) or absolute from 0 up to 600 bar
- Standard output signal: 4 – 20 mA
- A wide range of pressure connections
- Fully digitally compensated
- For use in ATEX Zone 2 explosive atmospheres
- UL approved

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Product specification

Technical data

Table 1: Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)		≤ ± 0.3% FS (typ.)
		≤ ± 0.8% FS (max.)
Non-linearity BFSL (conformity)		≤ ± 0.2% FS
Hysteresis and repeatability		≤ ± 0.1% FS
Thermal zero point shift		≤ ± 0.1% FS / 10K (typ.)
		≤ ± 0.2% FS / 10K (max.)
Thermal sensitivity (span) shift		≤ ± 0.1% FS / 10K (typ.)
		≤ ± 0.2% FS / 10K (max.)
Response time:	Liquids with viscosity < 100 cSt	< 4 ms
Overload pressure (static)		6 × FS (max. 1500 bar)
Burst pressure		6 × FS (max. 2000 bar)
Power-up time		< 50 ms
Durability, P: 10 – 90% FS		> 10 × 10^6 cycles
MTTFd - Calculation based on the SN 29500		> 100 years

Table 2: Electrical specifications

Nom. output signal (short-circuit protected)	4 – 20 mA
Supply voltage [U_B] (polarity protected)	9 – 32 V DC (12 / 24 V DC nom.)
Supply voltage dependency	< 0.1% FS / 10 V
Output limitation	22.4 mA
Load	$R_L \leq (U_B - 9\ V) / 0.02\ A[\Omega]$

Table 3: Environmental conditions

Sensor operating temperature	Normal		-40 – 85 °C
	ATEX Zone 2		-20 – 85 °C
Media temperature range			-40 – 85 °C
Ambient temperature range (depending on electrical connection)			See Electrical connections
Compensated temperature range			0 – 80 °C
Transport/storage temperature range			-50 – 85 °C
EMC – Emission			EN 61000-6-3
EMC – Immunity			EN 61000-6-2
Insulation resistance			> 100 MΩ at 500 V DC
Vibration stability	Sinusoidal	15.9 mm-pp, 5 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 connections

Table 4: Explosive atmospheres

Zone 2 applications[1]	CE Ex II 3G Ex ec IIA T4 Gc -20°C<Ta<+85°C	EN60079-0; EN60079-7

[1] The Pressure transmitter must be installed where it cannot be exposed to impact in normal use.

Table 5: Mechanical characteristics

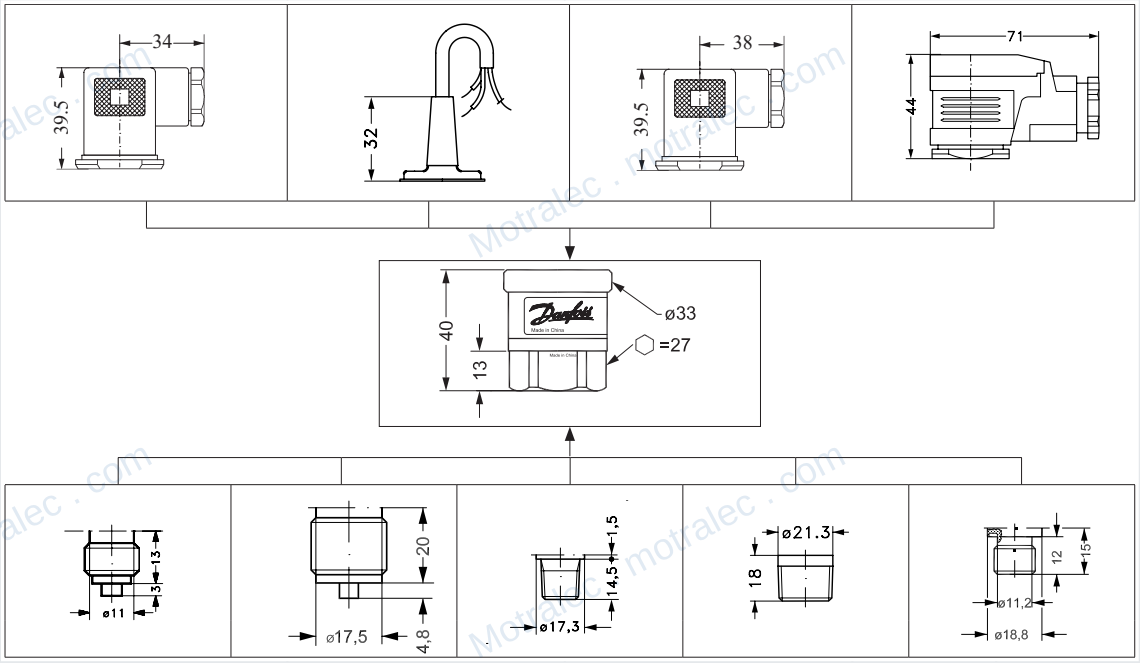
Materials	Wetted parts	EN 10088-1; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1; 1.4404 (AISI 316 L)
	Electrical connections	See Electrical connections
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

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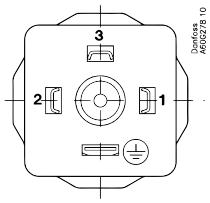
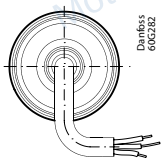
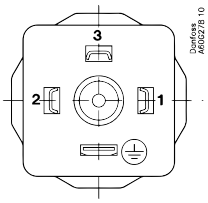
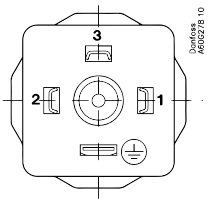
Dimensions / Combinations

Table 6: Dimensions / Combinations

Type code	A1	F4	A6	H3	
	EN175301-803-A,Pg9	2 m screened cable	EN 175301-803-A, Pg 11	EN175301-803-A, M20	
					
	G ¼ A (EN 837)	G ½ A (EN 837)	¼ –18 NPT	½ – 14 NPT	G ¼ (DIN 3852-E)
Type code	**AB04**	**AB08**	**AC04**	**AC08**	**GB04**
Recommended torque[1]	30 – 35 Nm	30 – 35 Nm	2 – 3 turns after finger tightened	2 – 3 turns after finger tightened	30 – 35 Nm

[1] Depends on different parameters as packing material, mating material, thread lubrication and pressure level

Electrical connections

Type code	A1	F4	A6	H3
	 EN 175301-803-A, Pg 9	 Cable screened ship 2m	 EN 175301-803-A, Pg 11	 EN 175301-803-A, M20
Ambient temperature	-40 – 85 °C	-30 – 85 °C	-40 – 85 °C	-40 – 85 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67	IP65	IP65
Material	Glass filled polyamid, PA 6.6	RTFRO cable with shrinkage tubing	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6
Electrical connection, 4 – 20 mA output (2 wire)	Pin1: + supply Pin 2: ÷ supply Pin 3: not used ⏚ Earth: Connected to MBS enclosure	Brown wire: + supply Black wire: ÷ supply Blue wire: Not used Screen connected to MBS enclosure	Pin1: + supply Pin 2: ÷ supply Pin 3: not used ⏚ Earth: Connected to MBS enclosure	Pin1: + supply Pin 2: ÷ supply Pin 3: not used ⏚ Earth: Connected to MBS enclosure

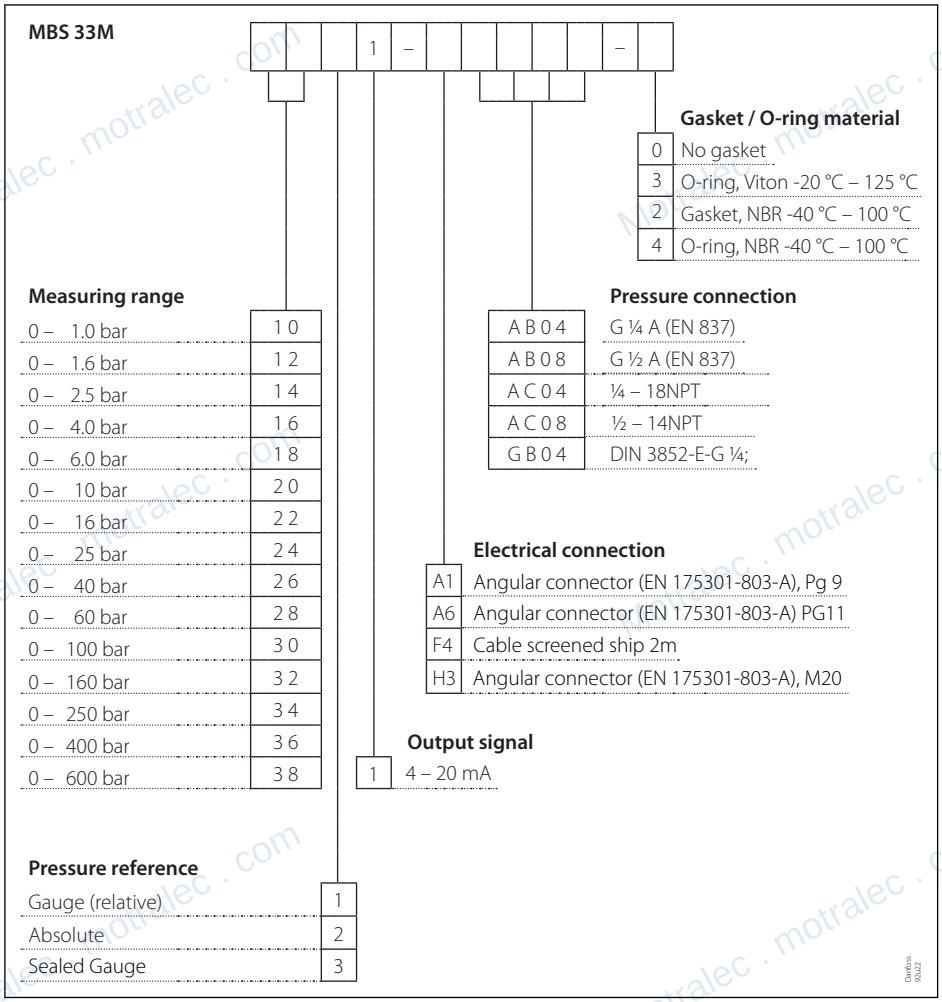
NOTE:
Please check Store.danfoss.com to find the correct variant for your requirements

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Ordering

Ordering standard

Figure 1: Ordering standard



NOTE:
Non-standard build-up combinations may be selected. However, minimum order quantities may apply. Please contact your local Danfoss office for further information or request on other versions.

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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 7: Certificates and declarations

File name	Document type	Document topic	Approval authority
2008558TA	Marine - Safety Certificate	-	LR
08472-E0 BV	Marine - Safety Certificate	-	BV
18-LD1740756-1-PDA	Marine - Safety Certificate	-	ABS
TAA000025S rev. 1	Marine - Safety Certificate	-	DNV GL
TJ18T00028	Marine - Safety Certificate	-	CCS
TA20389M	Marine - Safety Certificate	-	NKK
SMS.W.II-2179-C.0	Marine - Manufacturing Permission	-	BV
E227388	Explosive - Safety Certificate	Hazardous Locations	UL
E31024	Electrical - Safety Certificate	-	UL
E311982	Electrical - Safety Certificate	-	UL
E494625	Electrical - Safety Certificate	-	UL
064G9615.11	EU-UK Declaration	ATEX / EMC / RoHS	Danfoss
CRN.0F18477.5123467890YTN	Pressure - Safety Certificate	CRN	TSSA
E510763	Electrical Safety Certificate	-	UL
CPH 04967-AE006	Marine Safety Certificate	-	KR
ELE098420XG	Marine Safety Certificate	-	RINA
LLC CDC EURO-TYSK UA.TR.089.1015.05-22	Pressure Certificate	-	LLC CDC EURO-TYSK
Danfoss UA 2023-01-10	UA Declaration	EMC/LVD	Danfoss
Danfoss UA 2023-01-10	UA Declaration	PED	Danfoss
EAC KZ 7500533.13.12.00845	EAC Declaration	EMC	EAC

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