

Data Sheet

Pressure transmitter
Type **MBS 33M**

For marine applications



The standard pressure 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

Product specification

Technical data

Table 1: Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)	$\leq \pm 0.5\%$ FS (typ.) $\leq \pm 1.0\%$ FS (max.)
Non-linearity BFSL (conformity)	$\leq \pm 0.2\%$ FS
Hysteresis and repeatability	$\leq \pm 0.1\%$ FS
Thermal zero point shift	$\leq \pm 0.1\%$ FS / 10K (typ.) $\leq \pm 0.2\%$ FS / 10K (max.)
Thermal sensitivity (span) shift	$\leq \pm 0.1\%$ FS / 10K (typ.) $\leq \pm 0.2\%$ FS / 10K (max.)
Response time:	Liquids with viscosity < 100 cSt
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

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] (load connected to 0 V)	$R_L \leq (U_B - 9 \text{ V}) / 0.02 \text{ A}[\Omega]$

Table 3: Environmental conditions

Sensor operating temperature	Normal	-40 – 85 °C
	ATEX Zone 2	-10 – 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
Mains frequency test		Based on SEN 361503
Vibration stability	Sinusoidal	15.9 mm-pp, 5 Hz – 25 Hz 20 g, 25 Hz – 2 kHz
	Random	7.5 g _{rms} , 5 Hz – 1 kHz
Shock resistance	Shock	500 g / 1 ms
	Free fall	1 m
Enclosure (depending on electrical connection)		See Electrical connections

Table 4: Explosive atmospheres

Zone 2 applications ⁽¹⁾	 Ex ce IIA T3 Gc -10°C < Ta < +85°C	EN60079-0; EN60079-7
------------------------------------	---	----------------------

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

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

Dimensions / Combinations

Table 6: Dimensions / Combinations

Type code	A1	A3	A6	A9	
	EN175301-803-A, Pg9	2 m screened cable	EN 175301-803-A, Pg 11	EN175301-803-A, Pg 13.5	
	G 1/4 A (EN 837)	G 1/2 A (EN 837)	1/4 – 18 NPT	1/2 – 14 NPT	G 1/4 (DIN 3852-E)
Type code	AB04	AB08	AC04	AC08	GB04
Recommended torque ⁽¹⁾	30 – 35 Nm	30 – 35 Nm	2 – 3 turns after finger tight-ened	2 – 3 turns after finger tight-ened	30 – 35 Nm

⁽¹⁾ Depends on different parameters as packing material, mating material, thread lubrication and pressure level

Electrical connections

Type code	A1	A3	A6	A9
	EN 175301-803-A, Pg 13.5	2 m screened cable	EN 175301-803-A, Pg 9	EN 175301-803-A, Pg 11
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	Poliolyfin cable with PE 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 Red wire: not used Orange: not used Screen: not 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

Ordering

Ordering standard

MBS 33M

				1	-												
--	--	--	--	---	---	--	--	--	--	--	--	--	--	--	--	--	--

Measuring range

0 – 1.0 bar	1 0
0 – 1.6 bar	1 2
0 – 2.5 bar	1 4
0 – 4.0 bar	1 6
0 – 6.0 bar	1 8
0 – 10 bar	2 0
0 – 16 bar	2 2
0 – 25 bar	2 4
0 – 40 bar	2 6
0 – 60 bar	2 8
0 – 100 bar	3 0
0 – 160 bar	3 2
0 – 250 bar	3 4
0 – 400 bar	3 6
0 – 600 bar	3 8

Gasket / O-ring material

0	No gasket
2	Gasket, NBR -40 °C – 85 °C
4	O-ring, NBR -40 °C – 85 °C

Pressure connection

A B 0 4	G ¼ A (EN 837)
A B 0 8	G ½ A (EN 837)
A C 0 4	¼ – 18NPT
A C 0 8	½ – 14NPT
G B 0 4	DIN 3852-E-G ¼;

Electrical connection

A1	Plug Pg 9 (EN175301-803-A)
A3	Screened cable, 2 m
A6	Plug Pg 11 (EN 175301-803-A)
A9	Plug Pg 13.5 (EN 175301-803-A)

Output signal

1	4 – 20 mA
---	-----------

Pressure reference

Gauge (relative)	1
Absolute	2

■ Preferred version

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.

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
18.10316.266	Marine - Safety Certificate	-	RMRS
19-20025	Marine - Safety Certificate	-	LR
05270-F0 BV	Marine - Safety Certificate	-	BV
18-LD1740756-1-PDA	Marine - Safety Certificate	-	ABS
TAA00000W0	Marine - Safety Certificate	-	DNV GL
TJ18T00028	Marine - Safety Certificate	-	CCS
TA17320M	Marine - Safety Certificate	-	NKK
SMS.W.II-2179-B.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
DK.C.30.018.A 31316	Measuring - Performance Certificate	-	GOST
064G9615.06	EU Declaration	ATEX/EMCD/RoHS	Danfoss
CRN.0F18477.5123467890YTN	Pressure - Safety Certificate	CRN	TSSA
060R3160.00	Manufacturers Declaration	China RoHS	Danfoss
064R9402.00	Manufacturers Declaration	PED	Danfoss
1786330	Explosive - Safety Certificate	-	CSA

Online support

Danfoss offers a wide range of support along with our products, including digital product information, software, mobile apps, and expert guidance. See the possibilities below.

The Danfoss Product Store



The Danfoss Product Store is your one-stop shop for everything product related—no matter where you are in the world or what area of the cooling industry you work in. Get quick access to essential information like product specs, code numbers, technical documentation, certifications, accessories, and more.

Start browsing at store.danfoss.com.

Find technical documentation



Find the technical documentation you need to get your project up and running. Get direct access to our official collection of data sheets, certificates and declarations, manuals and guides, 3D models and drawings, case stories, brochures, and much more.

Start searching now at www.danfoss.com/en/service-and-support/documentation.

Danfoss Learning



Danfoss Learning is a free online learning platform. It features courses and materials specifically designed to help engineers, installers, service technicians, and wholesalers better understand the products, applications, industry topics, and trends that will help you do your job better.

Create your Danfoss Learning account for free at www.danfoss.com/en/service-and-support/learning.

Get local information and support



Local Danfoss websites are the main sources for help and information about our company and products. Find product availability, get the latest regional news, or connect with a nearby expert—all in your own language.

Find your local Danfoss website here: www.danfoss.com/en/choose-region.

Spare Parts



Get access to the Danfoss spare parts and service kit catalog right from your smartphone. The app contains a wide range of components for air conditioning and refrigeration applications, such as valves, strainers, pressure switches, and sensors.

Download the Spare Parts app for free at www.danfoss.com/en/service-and-support/downloads.

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.