ENGINEERING TOMORROW



**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



# **Product specification**

# **Technical data**

## Table 1: Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)		$\leq \pm 0.3\%$ FS (typ.)	
		$\leq$ ± 0.8% FS (max.)	
Non-linearity BFSL (conformity)		$\leq \pm 0.2\%  \text{FS}$	
Hysteresis and repeatability		≤ ± 0.1% FS	
Thermal zero point shift		$\leq$ ± 0.1% FS / 10K (typ.)	
		$\leq$ ± 0.2% FS / 10K (max.)	
Thermal sensitivity (span) shift		$\leq$ ± 0.1% FS / 10K (typ.)	
memai sensitivity (span) siliit		$\leq$ ± 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		$> 10 \times 10^6$ 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 <sub>L</sub> ] (load connected to 0 V)	$R_{L} \le (U_{B} - 9 \text{ V}) / 0.02 \text{ A}[\Omega]$

#### **Table 3: Environmental conditions**

Concar appraisa tamparatura	Normal		-40 – 85 °C
Sensor operating temperature	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			$> 100~\text{M}\Omega$ at 500 V DC
Mains frequency test			Based on SEN 361503
	Sinusoidal	15.9 mm-pp, 5 Hz – 25 Hz	IEC 60068-2-6
Vibration stability		20 g, 25 Hz – 2 kHz	
	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 Electrical connections	

## **Table 4: Explosive atmospheres**

•		
Zone 2 applications <sup>(1)</sup>	<b>C €</b> ⟨Ex⟩ <sub>II 3G</sub> Ex ce IIA T3 Gc -10°C <ta<+85°c< td=""><td>EN60079-0; EN60079-7</td></ta<+85°c<>	EN60079-0; EN60079-7

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

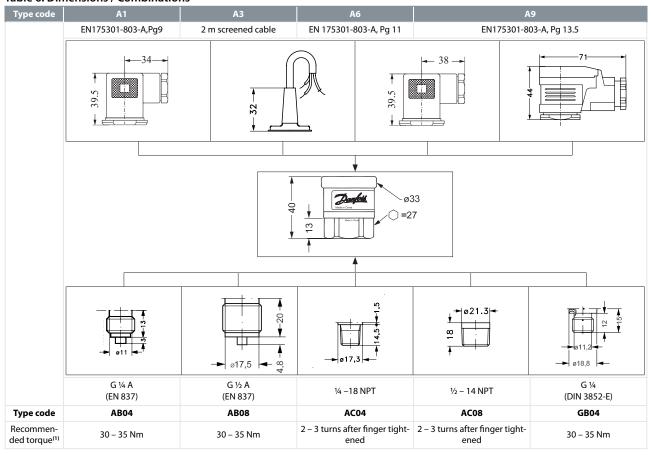
## **Table 5: Mechanical characteristics**

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	



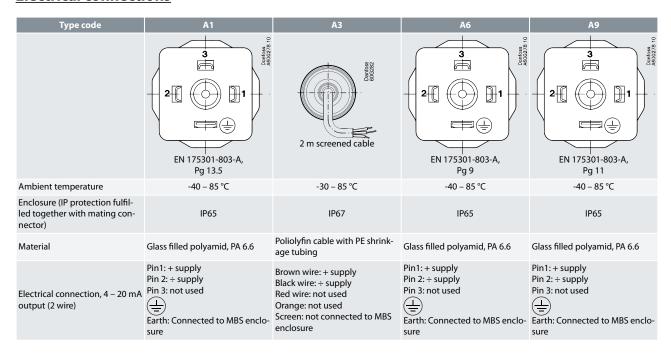
# **Dimensions / Combinations**

**Table 6: Dimensions / Combinations** 



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

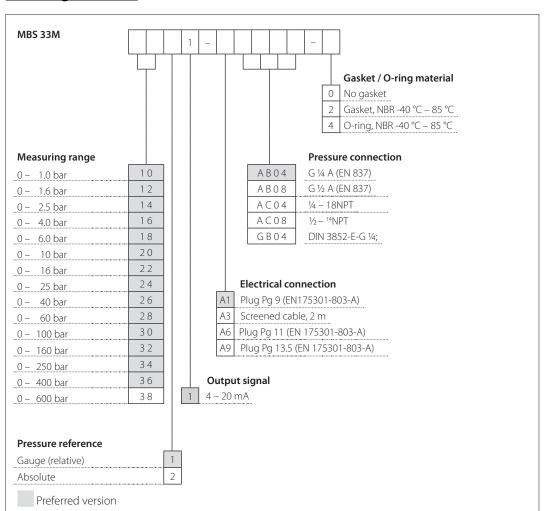
# **Electrical connections**





# **Ordering**

# **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.



# 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.