Data sheet



Pressure transmitter

MBS 3300 / MBS 3350

For high temperature marine applications

Description

The compact high temperature pressure transmitter 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 different output signals, absolute or gauge (relative) versions, measuring ranges from 0 – 1 to 0 – 600 bar and a wide range of pressure and electrical connections.

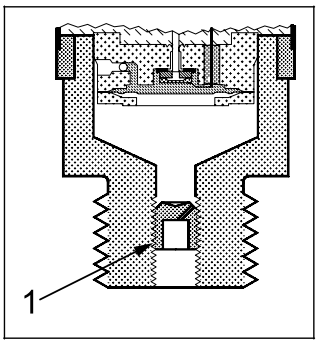
A robust design, an exellent vibration stability, and a high degree of EMC / EMI protection equip the pressure transmitter to meet the most stringent marine requirements

Features & benefits

- Designed for use in severe maritime environments
- For medium and ambient temperatures up to 125 °C
- All standard output signals:
  - Ratiometric 10 - 90% of supply
  - 4 – 20 mA
  - 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V
- Enclosure and wetted parts of AISI 316L
- A wide range of pressure and electrical connections
- Fully digitally compensated
- For use in ATEX Zone 2 explosive atmospheres
- UL approved

Applications

Application and media conditions (MBS 3350)



1	Pulse-snubber

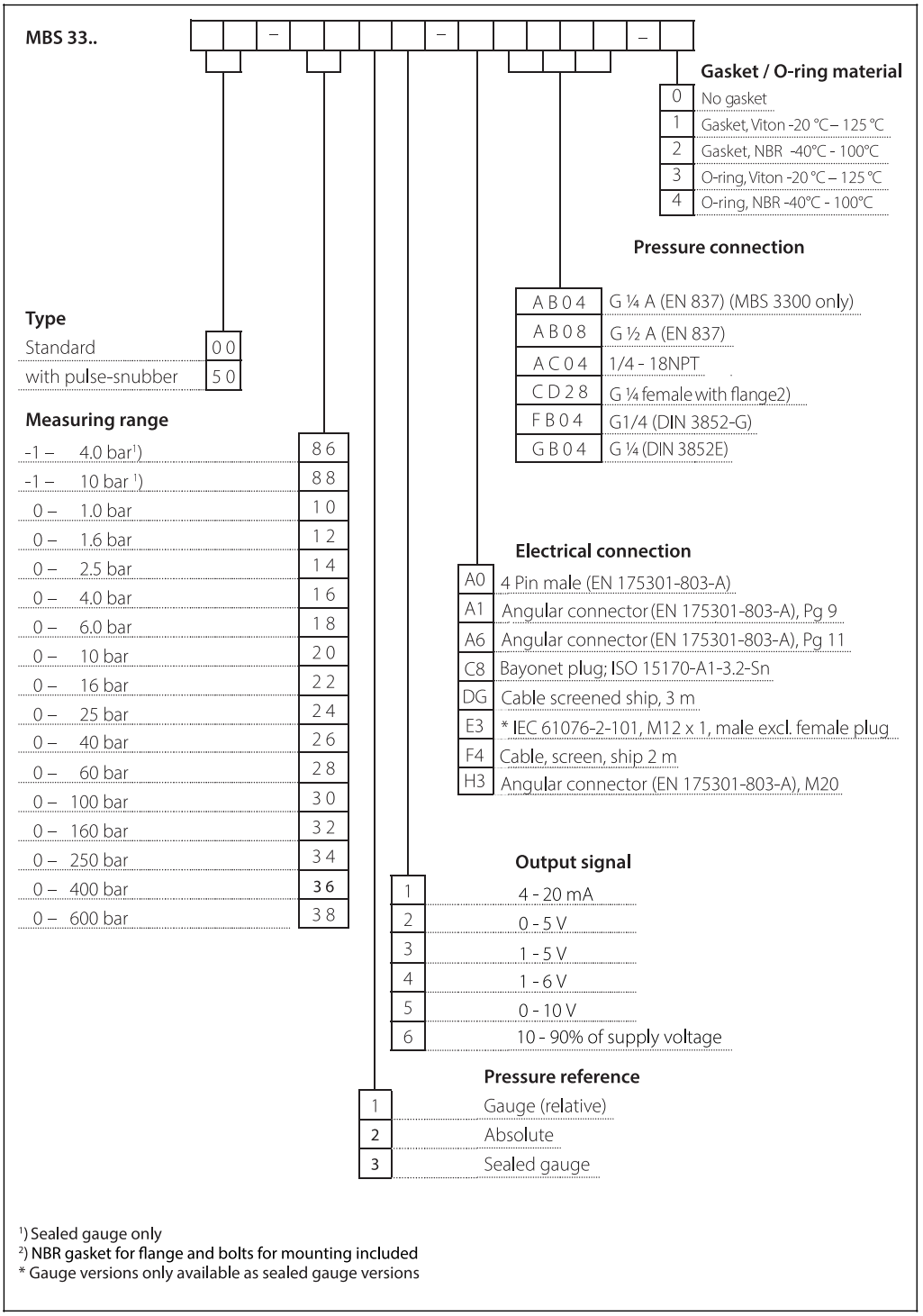
Application
Cavitation, liquid hammer and pressure peaks may occur in liquid filled hydraulic systems with changes in flow velocity, e.g. fast closing of a valve or pump starts and stops.
Liquid backlash can create huge pressure peaks of a non uniform nature and damage the diaphragm. The problem may occur on the inlet and outlet side, even at rather low operating pressures.

Media condition
Clogging of the nozzle may occur in liquids containing particles. Mounting the transmitter in an upright position minimizes the risk of clogging, because the flow in the nozzle is limited to the startup period until the dead volume behind the nozzle orifice is filled.
The media viscosity has only little effect on the response time. Even at a viscosities up to 100 cSt, the response time will not exceed 4 ms.

Ordering

Product code numbers

MBS 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.

Note: For a detailed overview of our existing code numbers, please visit the Danfoss Product Store at store.danfoss.com. You can use the filtering options to find the right sensor for your specific needs.

Product details

General data

Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)		≤ ± 0.5% FS (typ.)
		≤ ± 1.0% FS (max.)
Non-linearity BFSL (conformity)		≤ ± 0.2% FS
Hysteresis and repeatability		≤ ± 0.1% FS
Thermal error band (compensated temperature range)		≤ ± 1.0% FS
Response time	Liquids with viscosity < 100 cSt	< 4 ms
	Air and gases (MBS 3350)	< 35 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

Electrical specifications

Nom. output signal (short-circuit protected)	4 – 20 mA	0 – 5 V, 1 – 5 V, 1– 6 V	0 – 10 V	10 – 90% of supply voltage
Supply voltage [U_B], polarity protected	9 – 32 V DC (12 / 24 V DC nom.)	9 – 32 V DC (12 / 24 V DC nom.)	15 – 32 V DC (12 / 24 V DC nom.)	4.5 – 5.5 V DC (5 V DC nom.)
Supply – current consumption	–	≤ 5 mA	≤ 8 mA	≤ 5 mA - 5 V
Supply voltage dependency	< 0.1% FS / 10 V	< 0.05% FS / 10 V		–
Ratiometricity	–	–		< 0.05% FS / 4.5 - 5.5 V
Output limitation	22.4 mA	0-5 V: 5.75 V 1-5 V: 5.6 V 1-6 V: 6.75 V	0-10 V: 11.5 V	≈ supply voltage
Sink / Source	–	< 1 mA		
Load [R_L]	R_L ≤ (U_B - 9 V) / 0.02 A	R_L ≥ 10 kΩ	R_L ≥ 15 kΩ	R_L ≥ 10 kΩ at 5 V DC

Environmental conditions

Sensor operating temperature (depending on gasket material)	4 – 20 mA		-40 – 100 °C
	10 – 90% of supply voltage 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V		-40 – 125 °C
Media temperature range			-40 – 125 °C
Ambient temperature range (depending on electrical connection)			See Electrical connections
Compensated temperature range			0 – 100 °C
Transport/storage temperature range			-50 – 125 °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

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.

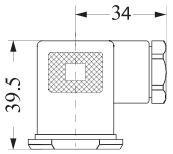
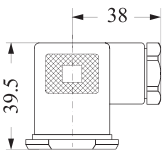
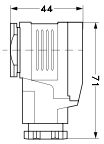
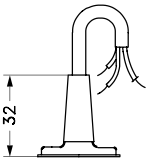
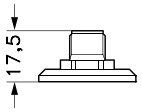
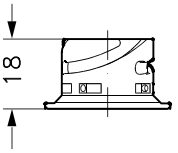
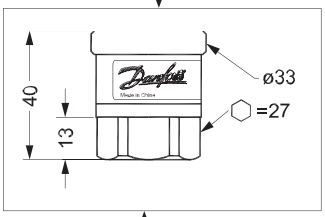
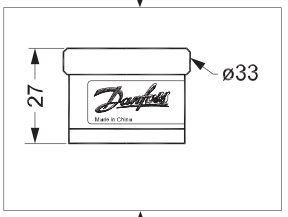
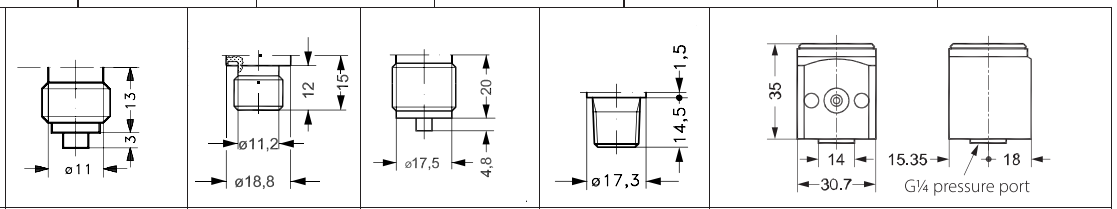
- Only versions with EN 175301-803-A, Screened cable, Flying leads, ISO 15170 Bayonet or Deutsch DT04-4p
- Deutsch DT04-4P: Must be installed in an enclosure that complies with the impact requirements in accordance to EN 60079-0

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
	Pressure connections	See Electrical connections
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

Dimensions

Dimensions/Combinations

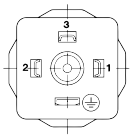
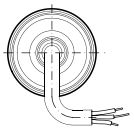
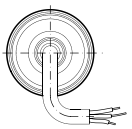
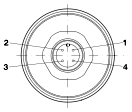
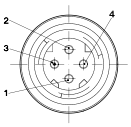
Type code	A1	A6	H3	F4 / DG	E3	C8
	EN 175301-803-A Pg 9	EN 175301-803-A Pg 11	EN 175301-803-A M20	Cable screened ship 2 m / 3 m	IEC 61076-2-101; M12 x1 male excl. female plug	ISO 15170-A1-3-2-Sn Bayonet
						
						
						
	G¼ A (EN 837)	G¼ (DIN 3852-E)	G½ A (EN 837)	¼ - 18 NPT	G¼ A female with flange	
Type code	**AB04**	**GB04**	**AB08**	**AC04**	**CD28**	
Recomended torque[1)]	30 - 35 Nm	30 - 35 Nm	30 - 35 Nm	2 - 3 turns after finger tightened		

[1)] Depends on various parameters such as seal material, coupling material, thread lubrication and pressure level

Note: Dimensions are in mm, unless stated otherwise.

Connections

Table: Standard Electrical connections

Type code See Dimensions/Combinations	A0 / A1 /A6 / H3	DG	F4	E3	C8
					
	EN 175301-803-A, 4PIN male, Pg9, Pg11 and M20	Cable screened ship, 3 m	Cable screened ship 2m	IEC 61076-2-101 M12 × 1; 4-pin	ISO 15170-A1-3.2-Sn Bayonet
Ambient temperature 4 - 20 mA output	-40 – 100 °C	-30 – 100 °C	-30 – 100 °C	-25 – 90 °C	-40 – 100 °C
Ambient temperature 0 - 5 V, 1 - 5 V, 1 - 6 V, 0 – 10 V and ratiometric output	-40 – 125°C	-30 – 125 °C	-30 – 125 °C	-25 – 90 °C	-40 – 125 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67	IP67	IP67	IP67
Atex Zone 2 enclosure	IP54				
Material	Glass filled polyamid, PA 6.6	RTFRO with PE shrinkage tubing	RTFRO with PE shrinkage tubing	Nickel plated brass, CuZn/Ni	Glass filled polyester PBT
Electrical connection, 4 – 20 mA output (2 wire)	Pin1: + supply Pin 2: ÷ supply Pin 3: not used  Earth: Connected to MBS enclosure	Black wire: + supply Blue wire: ÷ supply Brown wire: not used Screen: Connected to MBS enclosure	Black wire: + supply Blue wire: ÷ supply Brown wire: not used Screen: Connected to MBS enclosure	Pin1: + supply Pin 2: not used Pin 3: not used Pin 4: - supply	Pin1: + supply Pin 2: ÷ supply Pin 3: not used Pin 4: not used
Electrical connection, 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V and ratiometric out- put	Pin1: + supply Pin 2: ÷ supply[1] Pin 3: + output  Earth: Connected to MBS enclosure	Black wire: + supply Blue wire: ÷ supply [1] Brown wire: + output Screen: Connected to MBS enclosure	Red wire: + Supply Black wire: -supply [1] Brown wire: Output Orange: not used Screen: not connected to MBS enclosure	Pin1: + supply Pin 2: not used Pin 3: + output Pin 4: - supply [1]	Pin1: + supply Pin 2: output Pin 3: Ventilation Pin 4: ÷supply[1]

[1] Common

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

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.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Issuer	Approval topic
Electrical Safety Certificate	UL E311982	UL - Underwriters Laboratories inc.	
Electrical Safety Certificate	UL E510763	UL - Underwriters Laboratories inc.	
Manufacturer's Declaration	Danfoss MD 060R3160.00	Danfoss	China RoHS
Pressure Safety Certificate	TSSA CRN.0F18477.5123467890YTN	TSSA - Technical Standards & Safety Authority	CRN
Explosive Safety Certificate	UL E227388	UL - Underwriters Laboratories inc.	UL-CSA, Explosive
Electrical Safety Certificate	UL E494625	UL - Underwriters Laboratories inc.	
Electrical Safety Certificate	UL E31024	UL - Underwriters Laboratories inc.	
Hygienic Certificate	NSF C0252992	NSF International	Drinking Water
EU-UK Declaration	Danfoss EU-UK 064G9615.11	Danfoss	EMC, EU RoHS, ATEX, UK RoHS
UA Declaration	Danfoss UA 2023-01-10 Regulators PL01 PL04	Danfoss	Pressure, PED
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.05-22	LLC CDC EURO TYSK - Ukraine	Pressure
Marine Certificate	ABS 23-2425974-PDA	ABS - American Bureau of Shipping	Marine
Marine Certificate	CCS TJ22PTB00047	CCS - China Classification Society	Marine
UA Declaration	Danfoss UA 2024-07-25 cooling sensors	Danfoss	LVD, EMC
Marine Certificate	LR 2511187TA	LR - Lloyd's Register	Marine
EAC Declaration	EAC KZ 7100841.13.12.00005	EAC - Eurasian Customs Union	EMC
Hygienic Certificate	NSF C863837	NSF International	Drinking Water
Export Control Declaration	Pressure & Temperature Sensors	Danfoss	
Marine Certificate	DNV TAA000025S	DNV	Marine
Marine Certificate	NKK TA25667M	ClassNK - The Japanese Marine Association	Marine
Marine Certificate	KR DNL34014-AE008	KR - Korean Register of Shipping	Marine
Marine Certificate	RINA ELE290425XG	RINA - Registro Italiano Navale	Marine

Marine Certificate	BV 08472-E0 BV	BV - Bureau Veritas	Marine
EU Declaration	PL 04 Packaging	Danfoss	Packaging

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