

Technical brochure

Pressure transmitter for marine applications Type MBS 3100 and MBS 3150



The compact ship approved pressure transmitter MBS 3100 is designed for use in almost all marine applications.

MBS 3150 with integrated pulse-snubber is designed for use in marine applications with severe medium influences like cavitation, liquid hammer or pressure peaks and offers a reliable pressure measurement, even under harsh environmental conditions.

The flexible pressure transmitter programme covers, absolute and gauge (relative) versions, measuring ranges from 0-1 to 0-600 bar and a wide range of pressure connections.

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

- 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
- Temperature compensated and laser calibrated

Pressure transmitter for marine applications, Types MBS 3100 and MBS 3150
**Ordering
standard versions
MBS 3100**

Plug: Pg 11 (EN 175301-803-A)
Output signal: 4-20mA

Pressure connection	Measuring range Pe ¹⁾ [bar]	Type no.	Code no.
G 1/4 A (EN 837)	0 - 4	MBS 3100 - 1611 - 6AB04	060G1367
	0 - 6	MBS 3100 - 1811 - 6AB04	060G1368
	0 - 10	MBS 3100 - 2011 - 6AB04	060G1369
	0 - 16	MBS 3100 - 2211 - 6AB04	060G1370
	0 - 25	MBS 3100 - 2411 - 6AB04	060G1371
	0 - 40	MBS 3100 - 2611 - 6AB04	060G1372
G 1/4 A, O-ring DIN 3852	0 - 4	MBS 3100 - 1611 - 6BB04	060G1463
	0 - 6	MBS 3100 - 1811 - 6BB04	060G1464
	0 - 10	MBS 3100 - 2011 - 6BB04	060G1465
	0 - 16	MBS 3100 - 2211 - 6BB04	060G1466
	0 - 25	MBS 3100 - 2411 - 6BB04	060G1467
	0 - 40	MBS 3100 - 2611 - 6BB04	060G1468
G 1/2 A (EN 837)	-1 - 1.5 ²⁾	MBS 3100 - 8411 - 6AB08	060G5600
	-1 - 5 ²⁾	MBS 3100 - 8711 - 6AB08	060G5601
	0 - 4	MBS 3100 - 1611 - 6AB08	060G1469
	0 - 6	MBS 3100 - 1811 - 6AB08	060G1470
	0 - 10	MBS 3100 - 2011 - 6AB08	060G1471
	0 - 16	MBS 3100 - 2211 - 6AB08	060G1472
	0 - 25	MBS 3100 - 2411 - 6AB08	060G1473
	0 - 40	MBS 3100 - 2611 - 6AB08	060G3388

¹⁾ Gauge/relative

²⁾ Sealed gauge

**Ordering
standard versions
MBS 3150**

Plug: Pg 11 (EN 175 301-803-A)
Output signal: 4-20 mA

Pressure connection	Measuring range Pe ¹⁾ [bar]	Type no.	Code no.
G 1/4 A, O-ring DIN 3852	0 - 6	MBS 3150 - 1811 - 6BB04	060G1474
	0 - 10	MBS 3150 - 2011 - 6BB04	060G1475
G 1/2 A (EN 837)	0 - 6	MBS 3150 - 1811 - 6AB08	060G1476
	0 - 10	MBS 3150 - 2011 - 6AB08	060G1477

¹⁾ Gauge/relative

Technical data
Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)	For range 0 to 600 bar	±0.5% FS (typ.) ±1% 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 MBS 3100		< 4 ms
Response time MBS 3150	liquids with viscosity <100 Cst Air and gases	< 4 ms < 35 ms
Overload pressure (Static)		6 × FS (max. 1500 bar)
Burst pressure		> 6 × FS (max. 2000 bar)
Durability, P: 10-90% FS		>10×10 ⁶ cycles

Electrical specifications

Nom. output signal (short circuit protected)	4 to 20 mA
Supply voltage (polarity protected)	9 to 32 V dc
Voltage dependency	< 0.2 %FS/10V
Current limitation	28 mA (typ.)
Load [R _L] (load connected to 0V)	$R_L \leq \frac{V_{\text{supply}} - 9\text{V}}{0.02\text{A}} [\Omega]$

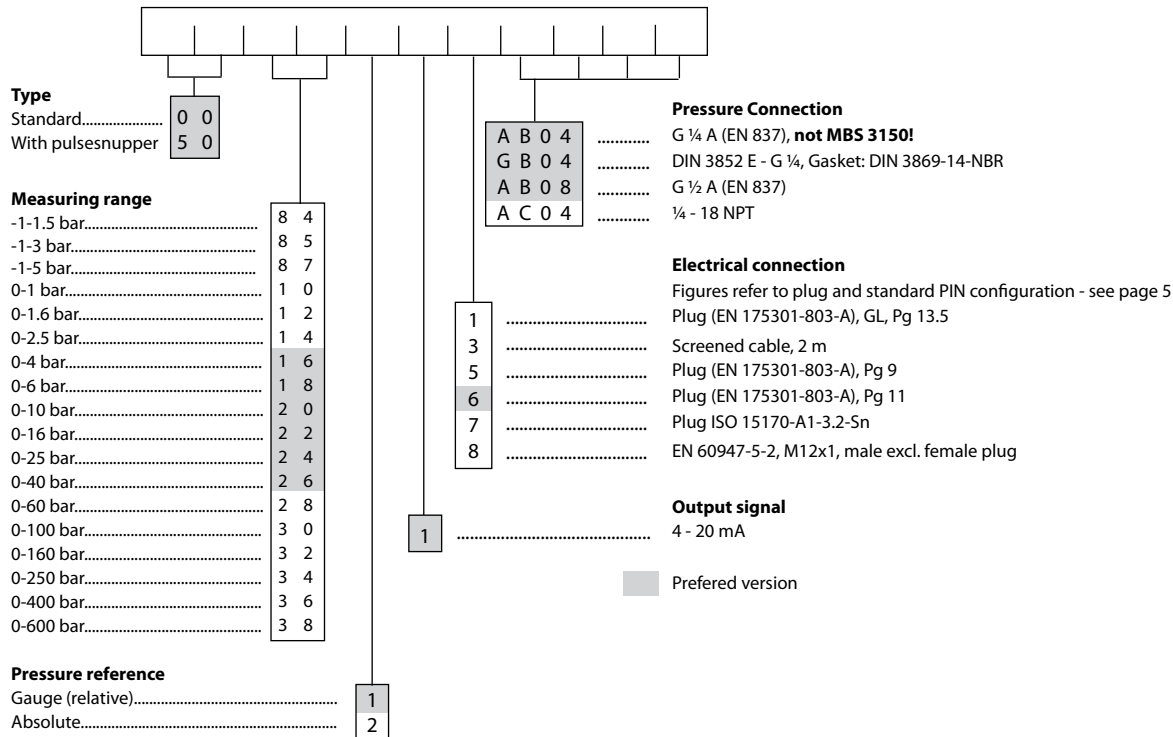
Environmental conditions

Medium temperature range	-40 → +85°C		
Ambient temperature range (depending on electrical connection)	see page 4		
Compensated temperature range	0 → +80°C		
Transport temperature range	-50 → +85°C		
EMC - Emission	EN 61000-6-3		
EMC Immunity	EN 61000-6-2		
Insulation resistance	> 100 MΩ at 100 V		
Mains frequency test	SEN 361503		
Vibration stability	Sinusoidal	15.9 mm-pp, 5 Hz-25 Hz 20 g, 25 Hz - 2 kHz	IEC 60068-2-6
	Random	7.5 g _{rms} , 5Hz-1kHz	IEC 60068-2-64
Shock resistance	Shock	500 g / 1 ms	IEC 60068 - 2 - 27
	Free fall		IEC 60068 - 2 - 32
Enclosure (depending on electrical connection)		see page 5	

Mechanical characteristics

Materials	Wetted parts	EN 10088-1 ; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1 ; 1.4404 (AISI 316 L)
	Pressure connection	see page 4
	Electrical connections	see page 5
Weight (depending on pressure connection and electrical connection)		0.2 - 0.3 kg

Ordering of special versions



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 for other versions

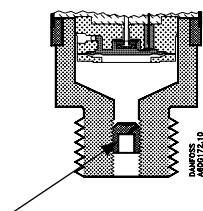
Dimensions / Combinations

Type code	1	3	5	6	7	8
	EN175301-803-A, Pg 13.5	2 m screened cable	EN 175301-803-A, Pg 9	EN175301-803-A, Pg11	ISO 15170-A1-3.2-Sn	EN 60947-5-2 M12x1 ; 4-pin
	G ½ A (EN 837)	¼ - 18 NPT	G ¼ A (EN 837)	DIN 3852-E-G ¼ Gasket: DIN 3869-14		
Type code	AB08	AC04	AB04	GB04		
Recommended torque1)	30-35 Nm	2-3 turns after finger tightened	30-35 Nm	30-35 Nm		

1) Depends of different parameters as packing material, mating material, thread lubrication and pressure level.

Electrical connections

Type code, page 4					
1	3	5	6	7	8
EN 175301-803-A, Pg 13.5	2 m screened cable	EN 175301-803-A, Pg 9	EN 175301-803-A, Pg 11	ISO 15170-A1-3.2-Sn	
<i>Ambient temperature</i>					
-40 → + 85 °C	-40 → + 85 °C	-40 → + 85 °C	-40 → + 85 °C	-40 → + 85 °C	-25 → + 85 °C
<i>Enclosure (IP protection fulfilled together with mating connector)</i>					
IP 65	IP 67	IP 65	IP 65	IP 67/IP69K	IP 67
<i>Materials</i>					
Glass filled polyamid, PA 6.6	Poliolyfin cable with PE shrinkage tubing	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	Glass filled polyester, PBI	Nickel plated brass, CuZn/Ni
<i>Electrical connection, 4 - 20 mA output (2 wire)</i>					
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	Pin1: + supply Pin 2: ÷ supply Pin 3: Fan Pin 4: Not used	Pin 1: + supply Pin 2: Not used Pin 3: Not used Pin 4: - supply

**MBS 3150
Application and media conditions**

Application

Cavitation, liquid hammer and pressure peaks may occur in hydraulic systems with changes in flow velocity, e.g. fast closing of a valve or pump starts and stops.
The problem may occur on 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 restricted to the start-up period when the dead volume behind the nozzle orifice is relatively big (0.3 mm). 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

Approvals

- Lloyd's Register of Shipping
- Det Norske Veritas
- Germanischer Lloyd
- RINA, Registro Italiano Navale
- American Bureau of Shipping
- Bureau Veritas
- Nippon Kaiji Kyokai
- MRS, Maritime Register of Shipping
- Korean Register of Shipping