

Pressure transmitters for marine applications

Type MBS 5100 and MBS 5150

Features



- Designed for use in severe maritime environments
- MBS 5150 with integrated pulse-snubber
- Resistant to cavitation and liquid hammer
- Pressure connection of acid-resistant stainless steel (AISI 316L)
- Pressure ranges in relative (gauge) or absolute from 0 up to 600 bar
- Output signal: 4 - 20 mA
- A wide range of pressure connections
- Temperature compensated and laser calibrated
- Accuracy 0.3% FS
- Zero and span adjustment

Description

The ship approved high accuracy block pressure transmitter is designed for use in almost all marine applications. MBS 5150 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 transmitters can be easily mounted directly on the MBV 5000 block test valve or the threaded pressure connection can be used.

The flexible pressure transmitter programme covers a 4-20 mA output signal, absolute and gauge (relative) versions, measuring ranges from 0-1 to 0-600 bar with zero and span adjustment.

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

Ordering standard versions

Plug: Pg 11 (EN 175301-803)
Output: 4-20 mA
Pressure connection: G 1/4 with flange connection

Measuring range P_e ¹⁾ [bar]	MBS 5100		MBS 5150	
	Type no.	Code no.	Type no.	Code no.
0 - 1	MBS 5100-1011-1DB04	060N1032	MBS 5150-1011-1DB04	060N1081
0 - 2,5	MBS 5100-1411-1DB04	060N1033	MBS 5150-1411-1DB04	060N1083
0 - 4	MBS 5100-1611-1DB04	060N1034	MBS 5150-1611-1DB04	060N1084
0 - 6	MBS 5100-1811-1DB04	060N1035	MBS 5150-1811-1DB04	060N1063
0 - 10	MBS 5100-2011-1DB04	060N1036	MBS 5150-2011-1DB04	060N1064
0 - 16	MBS 5100-2211-1DB04	060N1037	MBS 5150-2211-1DB04	060N1065
0 - 25	MBS 5100-2411-1DB04	060N1038	MBS 5150-2411-1DB04	060N1085
0 - 40	MBS 5100-2611-1DB04	060N1039	MBS 5150-2611-1DB04	060N1066
0 - 60	MBS 5100-2811-1DB04	060N1040	MBS 5150-2811-1DB04	060N1086
0 - 100	MBS 5100-3011-1DB04	060N1041	MBS 5150-3011-1DB04	060N1087

¹⁾ Relative/ gauge

Technical data

Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)	±0.1% FS (typ.) ±0.3% 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 5100	< 4 ms	
Response time MBS 5150	Liquids with viscosity < 100 cSt	< 4 ms
	Air and gases	< 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	
Zero point adjustment	0-1 to 0-10 bar measuring range	-5 to +20 % FS
	0-16 to 0-40 bar measuring range	-5 to +10% FS
	0-60 to 0-600 bar measuring range	-5 to +2.5% FS
Span adjustment	0-1 to 0-600 bar measuring range	-5 to +5% FS

Electrical specifications

Nom. output signal (short circuit protected)	4 to 20 mA
Supply voltage, U _B (polarity protected)	10 to 32 V dc
Supply voltage dependency	≤ ±0.01% FS/10 V
Current limitation (linear output signal up to 1.5 × rated range)	28 mA (typ.)
Load [R _L] (load connected to 0 V)	$R_L \leq \frac{U_B - 10 V}{0.02 A}$ [Ω]

Environmental conditions

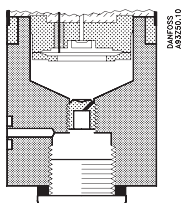
Medium temperature range	-40 → +85 °C	
Ambient temperature range (depending on electrical connection)	-40 → + 85 °C	
Compensated temperature range	0 → +80°C	
Transport temperature range	-50 → +85°C	
EMC - Emission	EN 61000-6-3	
EMC Immunity	EN 61000-6-2 ¹⁾	
Insulation resistance	> 100 MΩ at 100 V	
Mains frequency test	SEN 361503	
Vibration stability	Sinusoidal	15.9 mm-pp, 5 Hz-25 Hz 20 g, 25 Hz - 2 kHz
	Random	7.5 g _{rms} , 5 Hz - 1 kHz
		IEC 60068-2-6 IEC 60068-2-34, IEC 60068-2-36
Shock resistance	Shock	500 g / 1 ms
	Free fall	IEC 60068 - 2 - 27 IEC 60068 - 2 - 32
Enclosure (depending on electrical connection)	IP65	

1) RF field 10 V/m, 26 MHz - 2 GHz deviation < 2% FS

Mechanical characteristics

Electrical connection	EN 175301-803 plug		
Wetted parts, material	Versions without flange connection	EN 10088-1; 1.4404 (AISI 316L)	
	Versions with flange connection	Pressure connection	AISI 316L
		Plug	Glass filled polyamid PA 6.6
		Plug gasket	W.no. 10388 Sn5
	O-ring for flange	NBR	
Enclosure material	Anodized AlMgSiPb		
Weight	0.4 kg		

Application and media conditions, MBS 5150



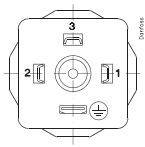
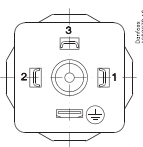
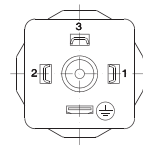
Application

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. The problem may occur on the inlet and outlet side, even at rather low operating pressures.

Media condition

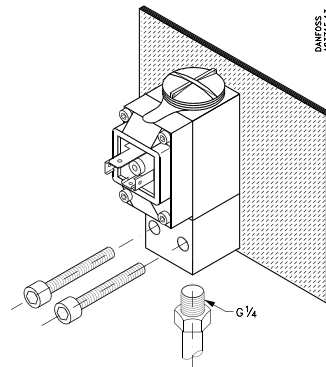
Clogging of the nozzle may occur in liquids containing particles. Mounting the transmitter in an upright position minimizes the risk of clogging, because the flow in the nozzle is restricted to the start-up period when the dead volume behind the nozzle fills, and furthermore because the nozzle orifice 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.

Electrical connections

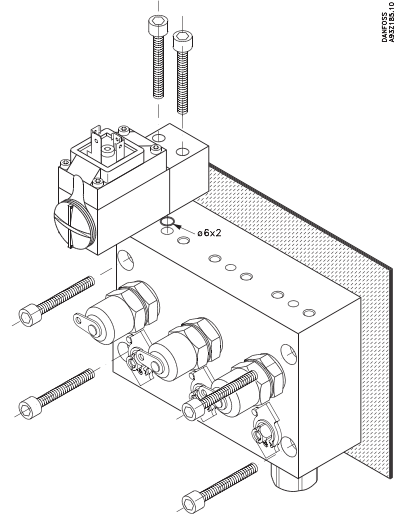
Plug type, page 3		
1	2	3
EN 175301-803, Pg 11	EN 175301-803, Pg 13.5	EN 175301-803, Pg 9
		
<i>Electrical connection, 4 - 20 mA output (2 wire)</i>		
Pin1: + supply Pin 2: ÷ supply Pin 3: Function test 40 - 200 mV Earth: Connected to MBS enclosure	Pin1: + supply Pin 2: ÷ supply Pin 3: Function test 40 - 200 mV Earth: Connected to MBS enclosure	Pin1: + supply Pin 2: ÷ supply Pin 3: Function test 40 - 200 mV Earth: Connected to MBS enclosure

Mechanical connection

Thread



Flange



- Lloyd's Register of Shipping
- Det Norske Veritas
- Germanischer Lloyd
- RINA, Registro Italiano Navale

- American Bureau of Shipping
- Bureau Veritas
- Nippon Kaiji Kyokai
- Korean Register of Shipping

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