

Data sheet

Pressure transmitter for marine applications

Type MBS 5100 and MBS 5150



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 or 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.

Features

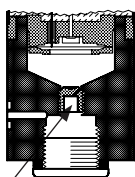
- Designed for use in severe maritime environments
- MBS 5150 with integrated pulse-snubber is suitable in marine applications with severe medium influences like cavitation, liquid hammer or pressure peaks and offers a reliable pressure measurement, even under harsh environmental conditions.
- Pressure 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
- For use in zone 2 explosive atmospheres

Approvals

Lloyds Register of shipping, LRS
 Germanischer Lloyd, GL
 Bureau Veritas, BV
 Det Norske Veritas, DNV
 Registro Italiano Navale, RINA

Nippon Kaiji Kyokai, NKK
 American Bureau of Shipping, ABS
 Korean Register of Shipping, KR
 China Classification Society, CCS
 Russian Maritime Register of Shipping, RMRS

Application and media conditions for MBS 5150



Pulse-snobber

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 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 start-up 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.

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	Liquids with viscosity < 100 cSt	< 4 ms
	Air and gases (MBS 5150)	< 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 – 20% FS
	0 – 16 to 0 – 40 bar measuring range	-5 – 10% FS
	0 – 60 to 0 – 600 bar measuring range	-5 – 2.5% FS
Span adjustment	0 – 1 to 0 – 600 bar measuring range	-5 – 5.0% FS

Electrical specifications

Nom. output signal (short-circuit protected)	4 – 20 mA
Supply voltage [U _B], polarity protected	10 – 32 V d.c.
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)	$R_L \leq (U_B - 10 V) / 0.02 A [\Omega]$

Technical data
(continued)
Environmental conditions

Sensor temperature range	Normal	-40 – 85 °C
	ATEX Zone 2	-10 – 85 °C
Media temperature range	115 - (0.35 x ambient temp.)	
Ambient temperature range (depending on electrical connection)	-40 – 85 °C	
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 ¹⁾	
Insulation resistance	> 100 MΩ at 100 V	
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 (IP protection fulfilled together with mating connector)		IP65

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

Explosive atmospheres

Zone 2 applications	 Ex nA IIA T3 Gc -40C<Ta<+85C	EN60079-0; EN60079-15
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When used in ATEX Zone 2 areas at temperatures <-10 °C the cable and plug must be protected against impact

Mechanical characteristics

Electrical connection	EN 175301-803-A 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		
Net weight	0.4 kg		

Ordering standard

MBS 51

Type	
Standard	00
With pulse snubber	50

Measuring range	
0 – 1.0 bar	10
0 – 1.6 bar	12
0 – 2.5 bar	14
0 – 4.0 bar	16
0 – 6.0 bar	18
0 – 10 bar	20
0 – 16 bar	22
0 – 25 bar	24
0 – 40 bar	26
0 – 60 bar	28
0 – 100 bar	30
0 – 160 bar	32
0 – 250 bar	34
0 – 400 bar	36
0 – 600 bar	38

Pressure connection	
CA 05	M10 × 1 female
CB 04	G ¼ female
CC 04	¼ – NPT female
DA 05	M10 × 1 female with flange
DB 04	G ¼ female with flange connection

Electrical connection	
Figures refer to plug and standard PIN configuration – see page 5	
0	No plug (EN 175301-803-A)
1	Plug (EN 175301-803-A), Pg 11
2	Plug (EN 175301-803-A), GL Pg 13.5
3	Plug (EN 175301-803-A), Pg 9

Output signal	
1	4 – 20 mA

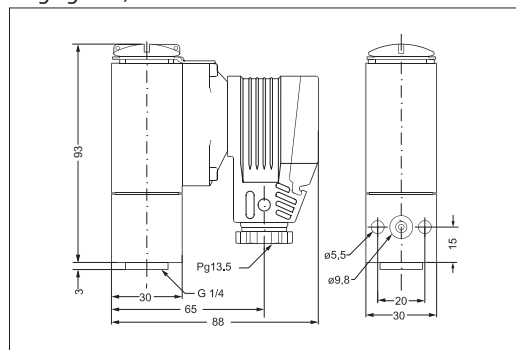
Pressure reference	
Gauge (relative)	1
Absolute	2

Preferred version

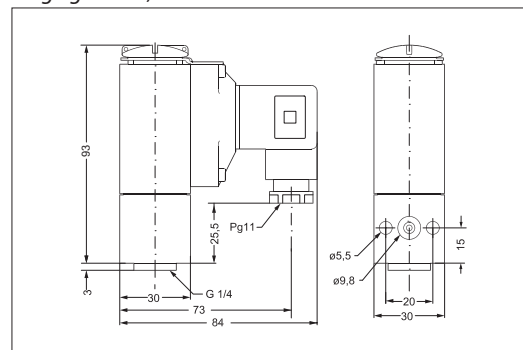
Non-standard build-up combinations may be selected. However, minimum order quantities may apply. Please contact your local Danfoss office for further information or request for other versions.

Dimensions

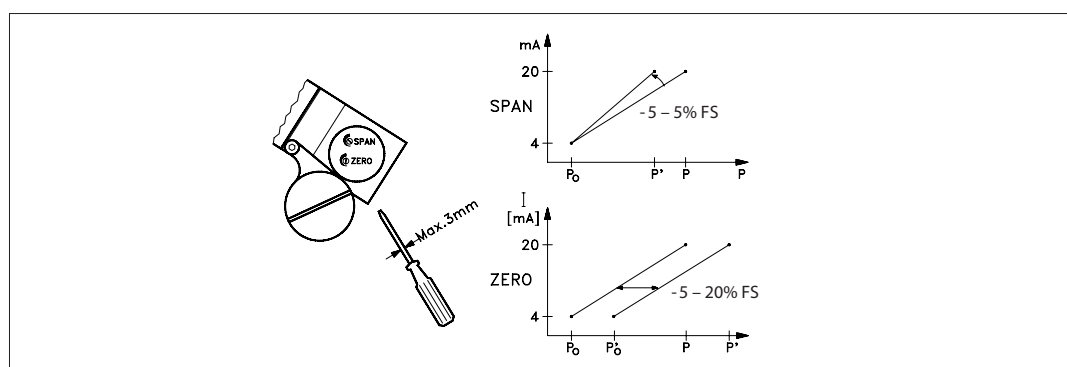
Plug Pg 13.5, EN 175301-803-A



Plug Pg 9 – 11, EN 175301-803-A



Adjustment

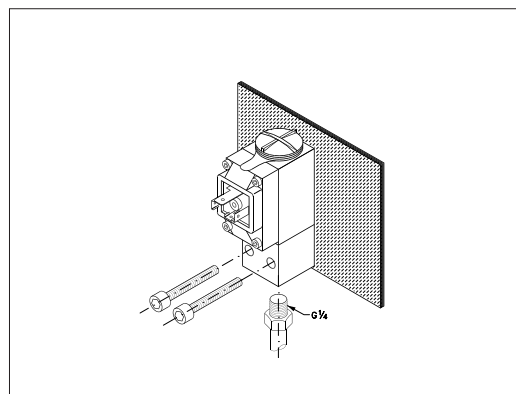


Electrical connections

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

Mechanical connection

Thread



Flange

