

Data Sheet

Pressure transmitter Type **MBS 5100** and **MBS 5150**

For marine applications



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

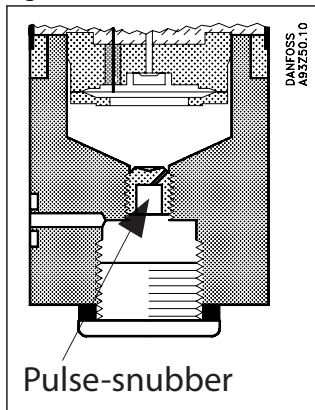
Features

- 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

Application

Application and media conditions for MBS 5150

Figure 1: MBS 5150



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.

Product specification

Technical data

Table 1: Performance (EN 60770)

Features		Description
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

Table 2: Electrical specifications

Features		Description
Nom. output signal (short-circuit protected)		4 – 20 mA
Supply voltage [UB], polarity protected		10 – 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 [RL] (load connected to 0 V)		RL ≤ (U _B - 10 V) / 0.02 A [Ω]

Table 3: Environmental conditions

Features		Description	
Sensor temperature range	Normal	-40 – 85 °C	
Media temperature range		115 - (0.35 × 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	IEC 60068-2-6
		20 g, 25 Hz – 2 kHz	
	Random	7.5 grms, 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 (IP protection fulfilled together with mating connector)		IP65	

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

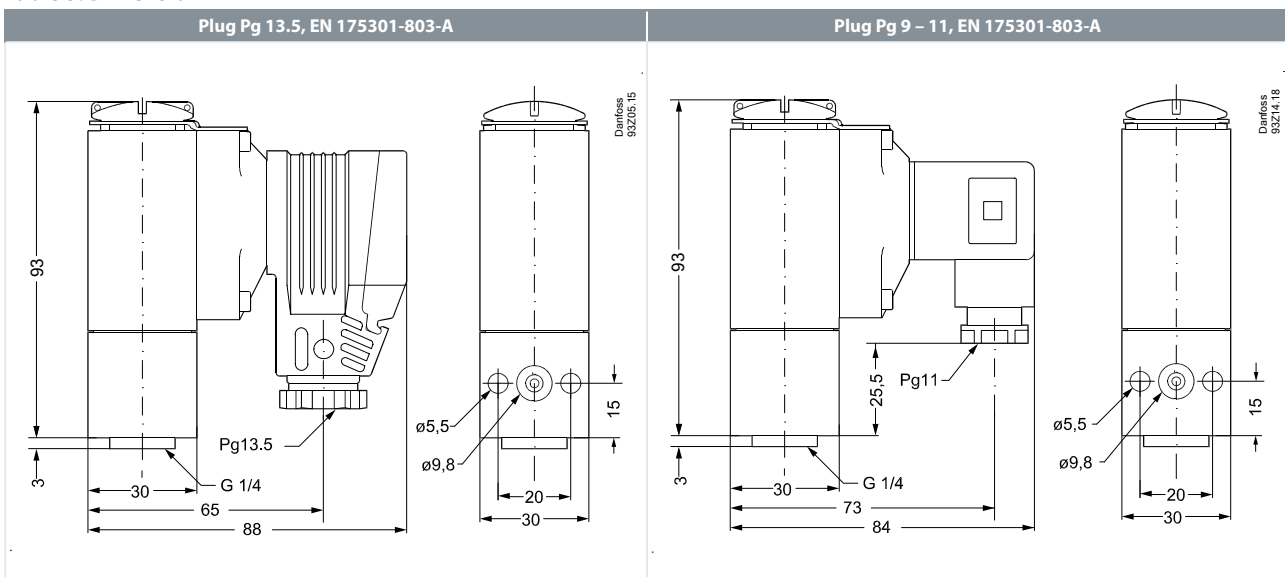
Pressure transmitter, Type MBS 5100 and MBS 5150

Table 4: Mechanical characteristics

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

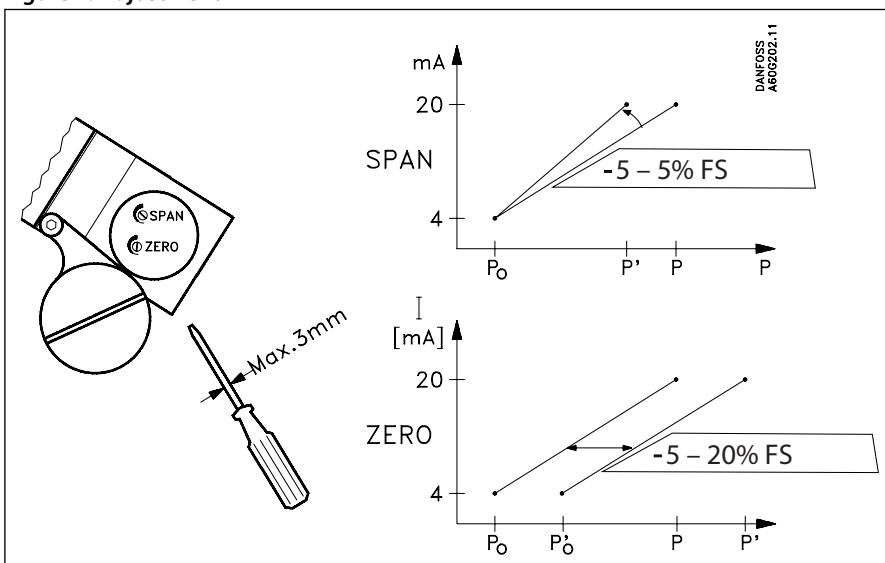
Dimension

Table 5: Dimension



Adjustment

Figure 2: Adjustment



Electrical connections

Table 6: Electrical connections

Plug type, page 4	A6	A9	A1
	<p>EN 175301-803-A, Pg 11</p>	<p>175301-803-A, Pg 13.5</p>	<p>175301-803-A, Pg 9</p>
Electrical connection, 4 – 20 mA output (2 wire)	<p>Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV Earth: Connected to MBS enclosure</p>	<p>Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV Earth: Connected to MBS enclosure</p>	<p>Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV Earth: Connected to MBS enclosure</p>

Mechanical connection

Table 7: Mechanical connection

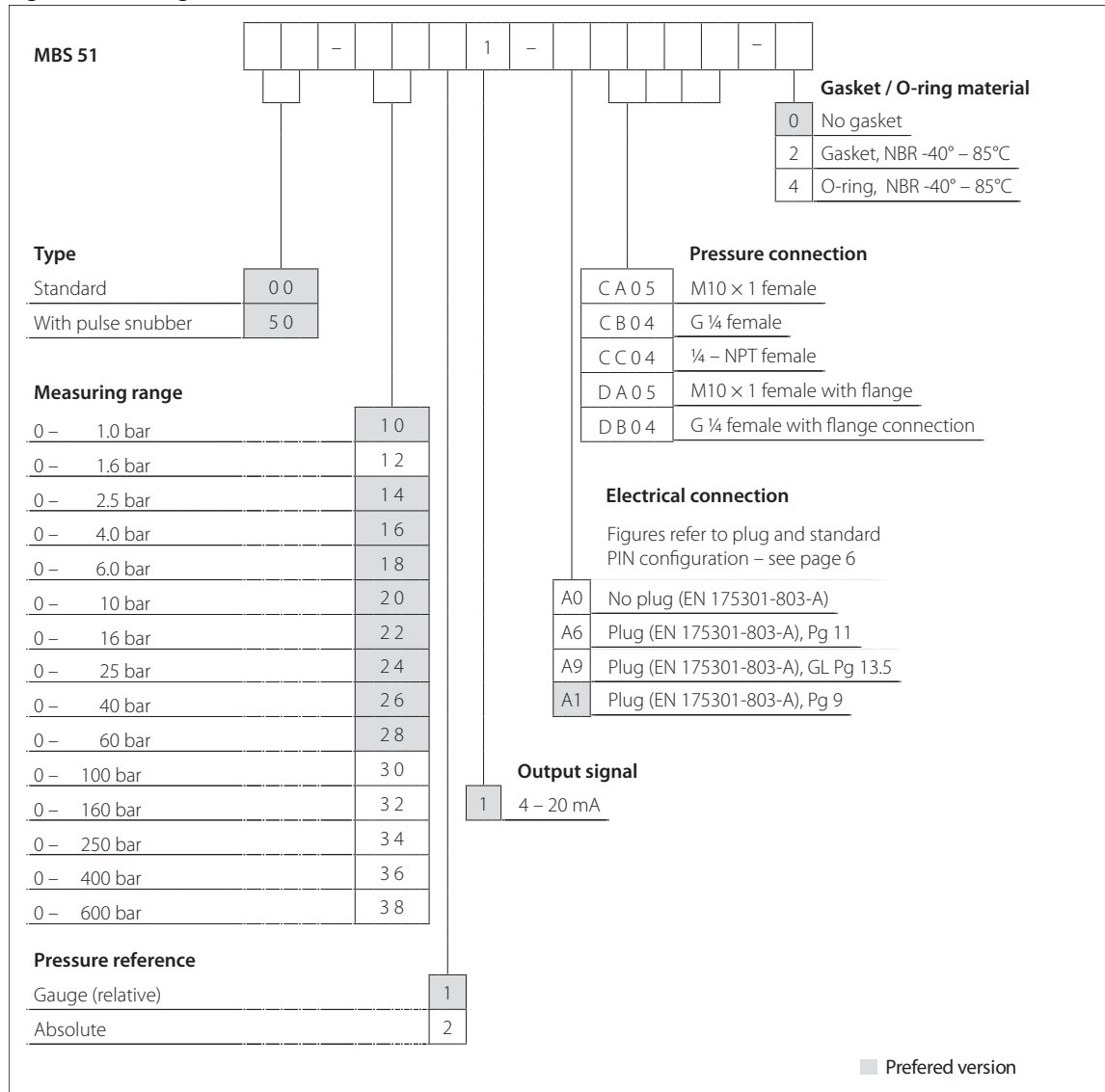
Thread	Flange
<p>DANFOSS AS2151.13</p> <p>G$\frac{1}{4}$</p>	<p>DANFOSS AS2151.13</p> <p>6x2</p>

Ordering

Ordering standards

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.

Figure 3: Ordering standards



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.

Valid approvals

Table 8: valid approvals

File name	Document type	Document topic	Approval authority
BV 06094-F0 BV	Marine - Safety Certificate		BV
RMRS 18.10316.266	Marine - Safety Certificate		RMRS
DNV GL TAA000013G	Marine - Safety Certificate		DNV GL
RINA ELE071320XP-001	Marine - Safety Certificate		RINA
NKK TA18355M	Marine - Safety Certificate		NKK
LR 2010635TA	Marine - Safety Certificate		LR
ABS 15-LD1317840-PDA	Marine - Safety Certificate		ABS
KR DLN 34014-AE001	Marine - Safety Certificate		KR
CCS TJ18T00028	Marine - Safety Certificate		CCS
UL E227388	Explosive - Safety Certificate	Hazardous Locations	UL
UL E31024	Electrical - Safety Certificate		UL
UL E311982	Electrical - Safety Certificate		UL
GOST DK.C.30.018.A 31316	Measuring - Performance Certificate		GOST
EU Declaration Danfoss 060R9400.02	EU Declaration	EMCD/ROHS	Danfoss
060R3160.00	Manufacturers Declaration	China RoHS	Danfoss
BV SMS.W.II-2179-B.0	Marine - Manufacturing Permission		BV
UL E494625	Electrical - Safety Certificate		UL
CSA 1786330	Explosive - Safety Certificate		CSA
ABS 15-LD1309521-PDA	Marine - Safety Certificate		ABS
BV 06094-F0 BV	Marine - Safety Certificate		BV
TSSA CRN.0F18477.5123467890YTN	Pressure - Safety Certificate	CRN	TSSA

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