

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 – 4 to 0 – 400 bar.

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

## Features

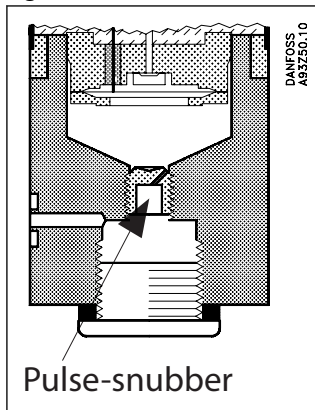
### Features

- 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 4 up to 400 bar
- Output signal: 4 – 20 mA
- A wide range of pressure connections
- Fully digitally compensated
- Accuracy 0.3% FS (max)
- UL approved
- Several Marine approvals

## 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. 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 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)**

Description	Values
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
Response time	Liquids with viscosity < 100 cSt
	Air and gases (MBS 5150)
Overload pressure (static)	< 4 ms
Burst pressure	< 35 ms
Power-up time	6 × FS (max. 1500 bar)
Durability, P: 10 – 90% FS	6 × FS (max. 2000 bar)
MTTFd - Calculation based on the SN 29500	< 50ms
	> 10 × 10 <sup>6</sup> cycles
	> 100 Years

**Table 2: Electrical specifications**

Description	Values
Nom. output signal (short-circuit protected)	4 – 20 mA
Supply voltage [UB], polarity protected	9 – 32 V DC
Supply voltage dependency	≤ ± 0.1 % FS / 10 V
Current limitation (linear output signal up to 1.5 × rated range)	22.4 mA
Load [RL] (load connected to 0 V)	RL ≤ (U <sub>B</sub> - 9 V) / 0.02 A [Ω]

**Table 3: Environmental conditions**

Description	Values
Sensor temperature range	Normal
Media temperature range	-40 – 85 °C
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
Insulation resistance	> 100 MΩ at 500 V
Vibration stability	Sinusoidal
	Random
Shock resistance	Shock
	Free fall
Enclosure (IP protection fulfilled together with mating connector)	IP65 (IP54 ATEX Zone 2)

**Table 4: Explosive atmospheres**

Zone 2 applications <sup>(1)</sup>	II 3G Ex ec IIA T4 Gc -20°C < Ta < +85°C	EN60079-0, EN60079-7
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<sup>(1)</sup> The Pressure transmitter must be installed where it cannot be exposed to impact in normal use

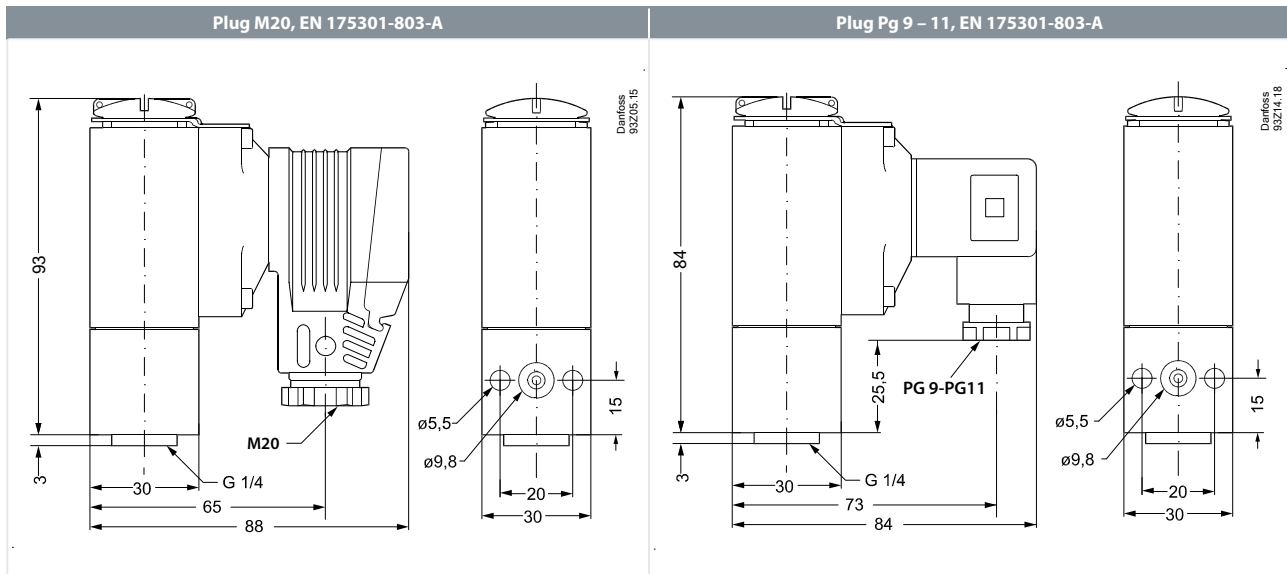
## Pressure transmitter, Type MBS 5100 and MBS 5150

**Table 5: Mechanical characteristics**

Description		Values	
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 6: Dimension**



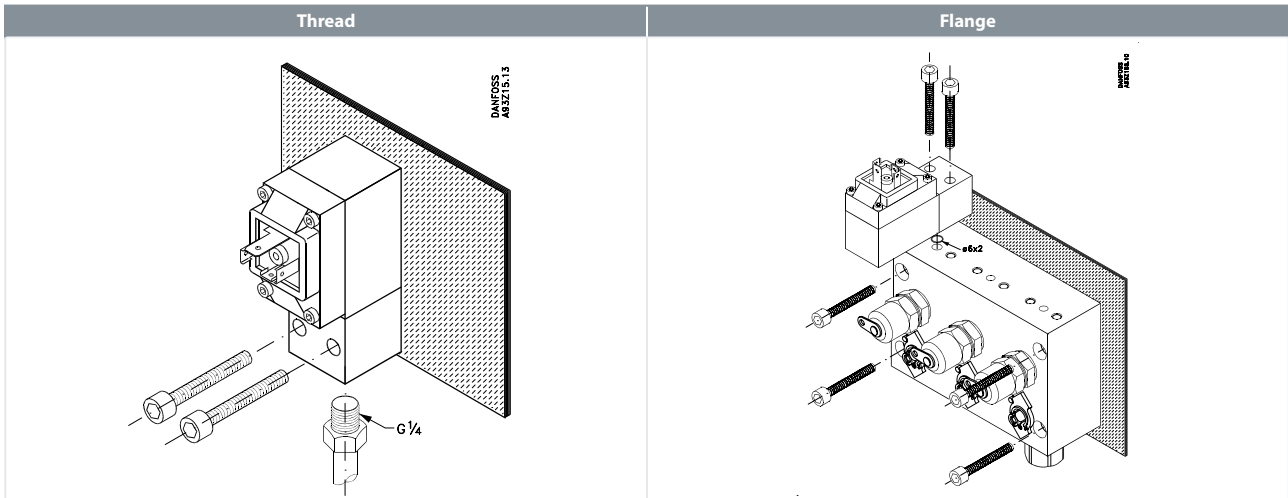
## Electrical connections

**Table 7: Electrical connections**

Plug type, page 4	A6	H3	A0/A1/J7
	<p>EN 175301-803-A, Pg 11</p>	<p>175301-803-A, M20</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 8: Mechanical connection

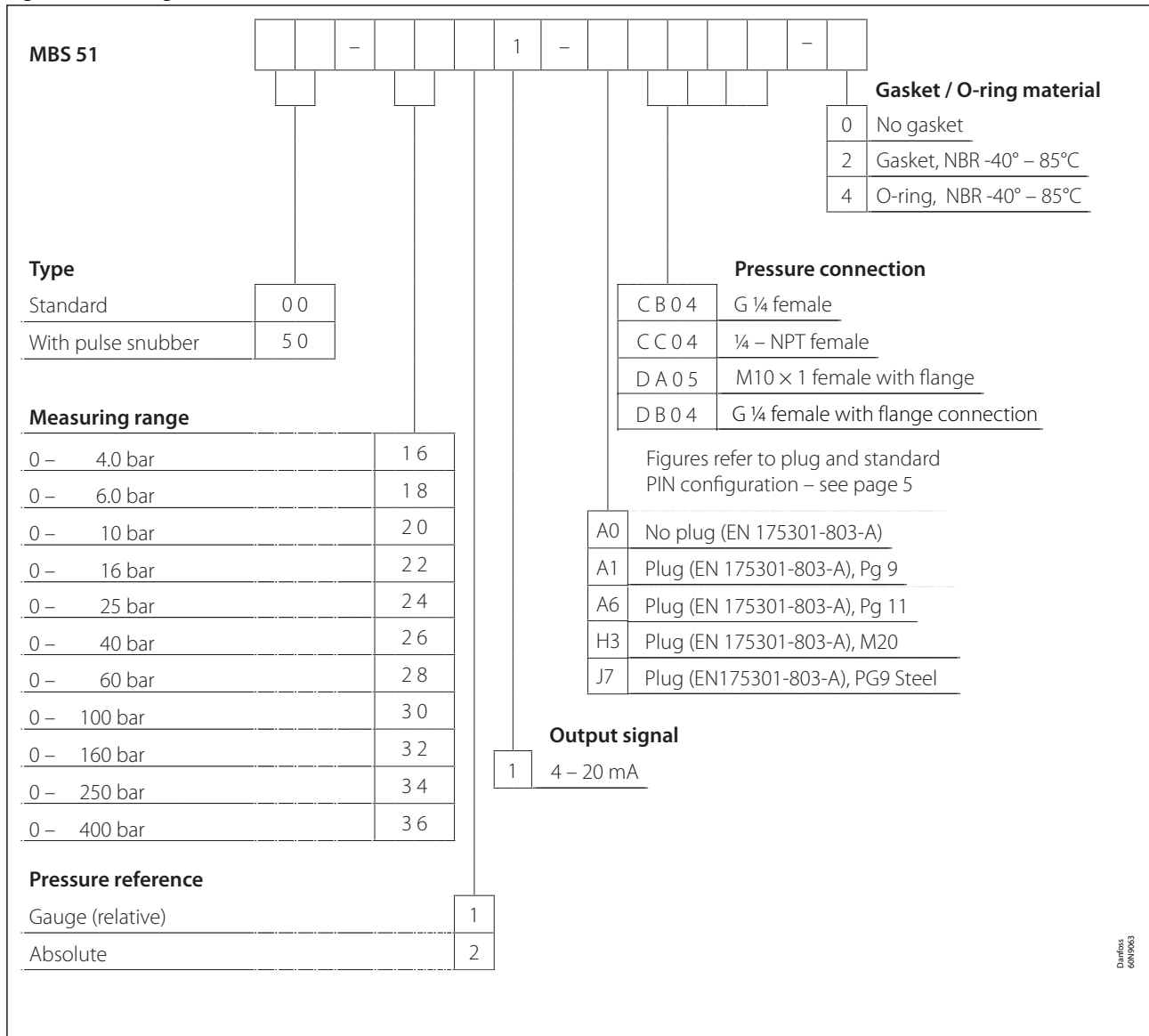


## Ordering

### 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 2: 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](http://danfoss.com) or contact your local Danfoss representative if you have any questions.

### Valid approvals

**Table 9: valid approvals**

File name	Document type	Document topic	Approval authority
<a href="#">BV 06094-F0 BV</a>	Marine - Safety Certificate		BV
<a href="#">DNV TAA000013G Rev.2</a>	Marine - Safety Certificate		DNV
<a href="#">RINA ELE031621XP</a>	Marine - Safety Certificate		RINA
<a href="#">NKK TA21099M</a>	Marine - Safety Certificate		NKK
<a href="#">LR 2010635TA-02</a>	Marine - Safety Certificate		LR
<a href="#">ABS 21-2092809-PDA</a>	Marine - Safety Certificate		ABS
<a href="#">KR DLN 34014-AE001</a>	Marine - Safety Certificate		KR
<a href="#">CCS TJ22PTB00047</a>	Marine - Safety Certificate		CCS
<a href="#">UL E227388</a>	Explosive - Safety Certificate	Hazardous Locations	UL
<a href="#">UL E31024</a>	Electrical - Safety Certificate		UL
<a href="#">UL E311982</a>	Electrical - Safety Certificate		UL
<a href="#">UL E510763</a>	Electrical - Safety Certificate		UL
<a href="#">Danfoss EU-UK 064G9615.11</a>	EU-UK Declaration	EMC/RoHS/ATEX	Danfoss
<a href="#">BV SMS.W.II-2179-C.0</a>	Marine - Manufacturing Permission		BV
<a href="#">UL E494625</a>	Electrical - Safety Certificate		UL
<a href="#">TSSA CRN.0F18477.5123467890YTN</a>	Pressure - Safety Certificate	CRN	TSSA



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