



Pressure transmitter

MBS 5100 / MBS 5150

For marine applications

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 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.

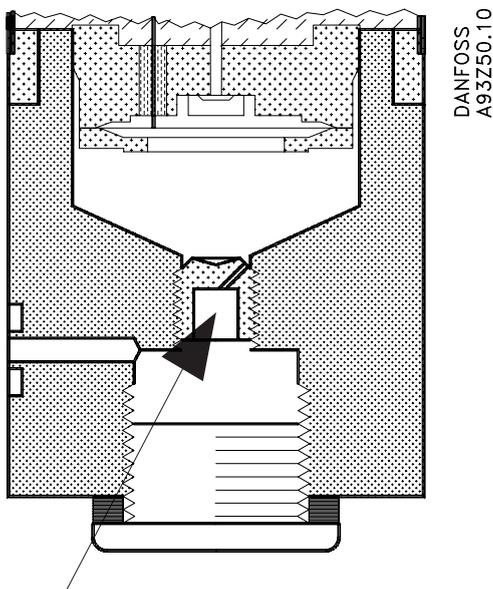
Features & benefits

- 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

Applications

Application and media conditions for MBS 5150

Figure: MBS 5150



Pulse snubber

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 details

General data

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

Table: 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 ≤ (UB- 9 V) / 0.02 A [Ω]

Table: Environmental conditions

Description		Values	
Sensor temperature range		Normal -40 – 85 °C	
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	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 (IP54 ATEX Zone 2)	

Table: Explosive atmospheres

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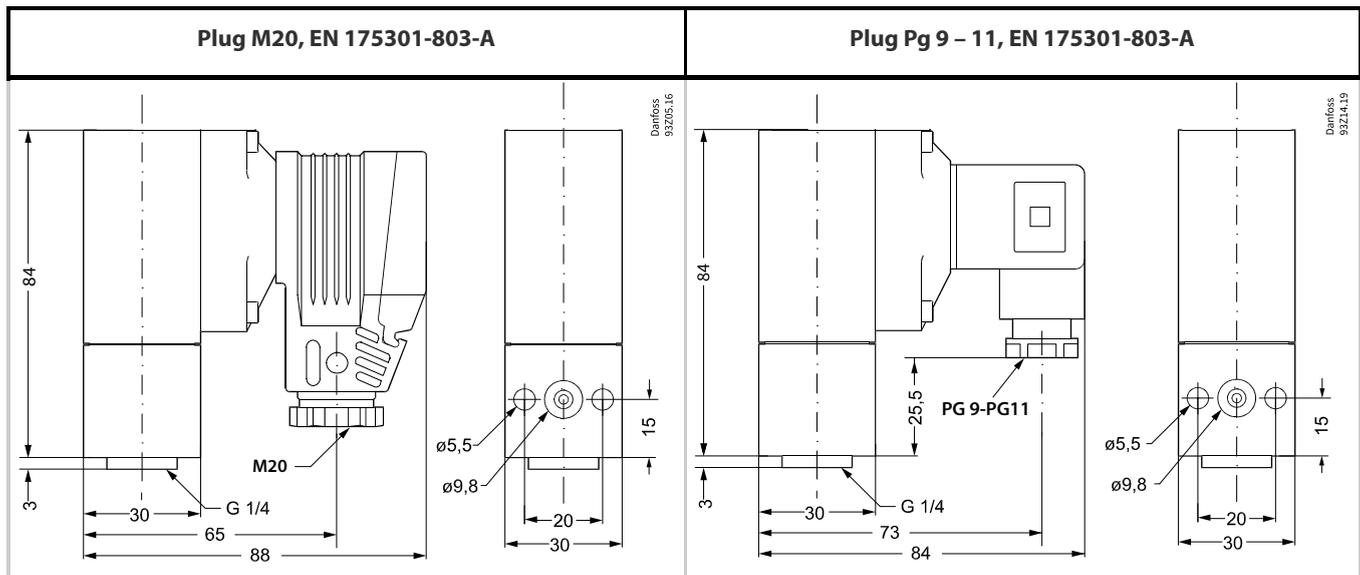
⁽¹⁾The Pressure transmitter must be installed where it cannot be exposed to impact in normal use

Table: 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	
	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

Dimensions

Table: Dimension



Connections

Table: 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</p> <p>Earth: Connected to MBS enclosure</p>	<p>Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV</p> <p>Earth: Connected to MBS enclosure</p>	<p>Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV</p> <p>Earth: Connected to MBS enclosure</p>

Table: Mechanical connection

Thread	Flange
<p>DANFOSS A9SZ15.13</p> <p>G1/4</p>	<p>DANFOSS A9SZ15.10</p> <p>6x2</p>

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.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Marine Certificate	BV 06094-G0 BV	BV - Bureau Veritas	Marine
Marine Certificate	NKK TA21099M	ClassNK - The Japanese Marine Association	Marine
Marine Certificate	LR 2584360TA	LR - Lloyd's Register	Marine
Marine Certificate	KR DLN 34014-AE001	KR - Korean Register of Shipping	Marine
Marine Certificate	CCS TJ22PTB00047	CCS - China Classification Society	Marine
Manufacturer's Declaration	Danfoss MD 060R3160.00	Danfoss	China RoHS
EU-UK Declaration	Danfoss EU-UK 064G9615.11	Danfoss	UK RoHS, EU RoHS, EMC, ATEX
Pressure Safety Certificate	TSSA CRN.OF18477.5123467890YTN	TSSA - Technical Standards & Safety Authority	CRN
Electrical Safety Certificate	UL E311982	UL - Underwriters Laboratories inc.	
Electrical Safety Certificate	UL E494625	UL - Underwriters Laboratories inc.	
Explosive Safety Certificate	UL E227388	UL - Underwriters Laboratories inc.	Explosive, UL-CSA
Electrical Safety Certificate	UL E31024	UL - Underwriters Laboratories inc.	
UA Declaration	Danfoss UA 2023-01-10 Regulators PL01 PL04	Danfoss	PED, Pressure
UA Declaration	Danfoss UA 2024-07-25 cooling sensors	Danfoss	LVD, EMC
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.05-22	LLC CDC EURO TYSK - Ukraine	Pressure
Export Control Declaration	Pressure & Temperature Sensors	Danfoss	
Marine Certificate	RINA ELE031621XP	RINA - Registro Italiano Navale	Marine
Marine Certificate	ABS 21-2092809-PDA	ABS - American Bureau of Shipping	Marine
EAC Declaration	EAC KZ 7100841.13.12.00005	EAC - Eurasian Customs Union	EMC
Marine Certificate	DNV TAA000013G Rev.2	DNV GL	
Electrical Safety Certificate	UL E510763	UL - Underwriters Laboratories inc.	

Contact details

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