ENGINEERING
TOMORROW

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

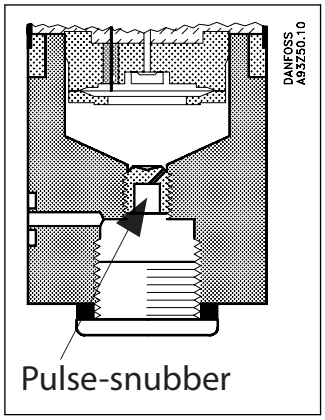
Features

- 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	< 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 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_B - 9 V) / 0.02 A [Ω]

Table 3: 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 4: Explosive atmospheres

Zone 2 applications[1]	CE Ex II 3G Ex ec IIA T4 Gc -20°C<Ta<+85°C	EN60079-0, EN60079-7

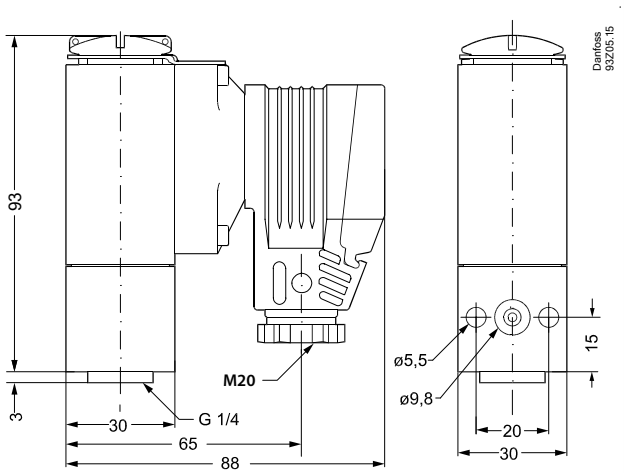
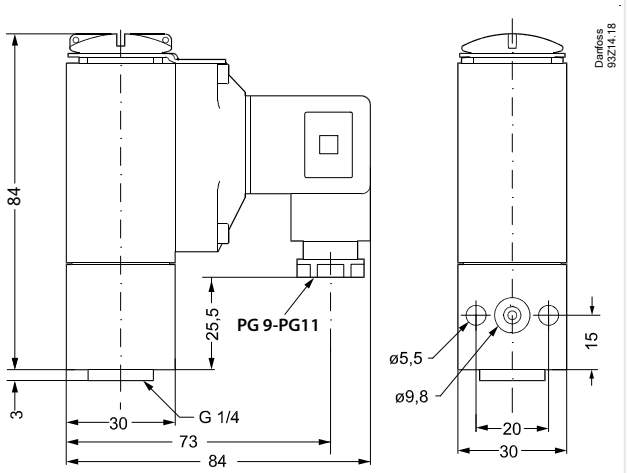
[1] The Pressure transmitter must be installed where it cannot be exposed to impact in normal use

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

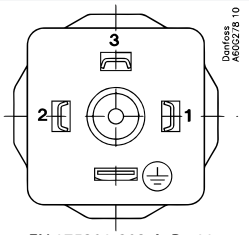
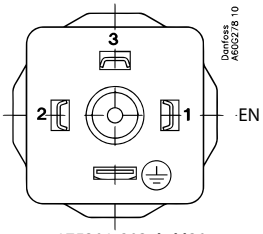
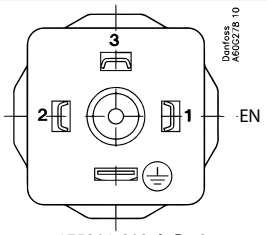
Dimension

Table 6: Dimension

Plug M20, EN 175301-803-A	Plug Pg 9 – 11, EN 175301-803-A
	

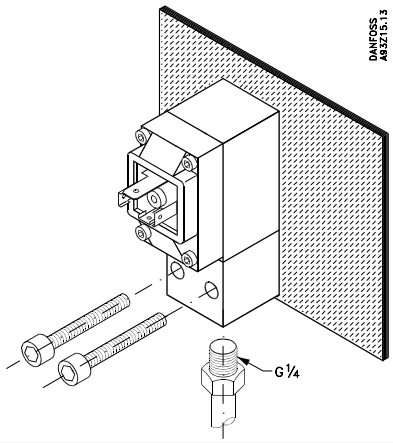
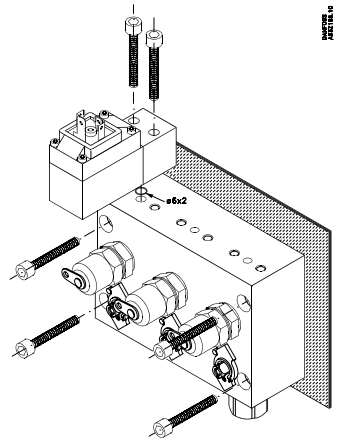
Electrical connections

Table 7: Electrical connections

Plug type, page 4	A6	H3	A0/A1/J7
	 EN 175301-803-A, Pg 11	 175301-803-A, M20	 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 Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply Pin 3: Function test 40 – 200 mV Earth: Connected to MBS enclosure

Mechanical connection

Table 8: Mechanical connection

Thread	Flange
	

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