

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

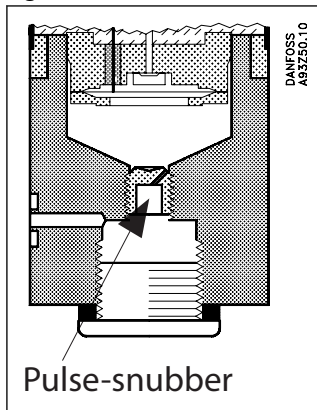
Features

- 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. 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) |
| | < 50ms |
| | >10 × 10 ⁶ cycles |



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 |
| Mains frequency test | Based on SEN 361503 |
| Vibration stability | Sinusoidal |
| | Random |
| Shock resistance | Shock |
| | Free fall |
| Enclosure (IP protection fulfilled together with mating connector) | IP65 |

Table 4: Explosive atmospheres

| | | |
|------------------------------------|--|----------------------|
| Zone 2 applications ⁽¹⁾ |   II 3G Ex ce IIA T3 Gc -10°C < Ta < +85°C | EN60079-0, EN60079-7 |
|------------------------------------|--|----------------------|

⁽¹⁾ When used in ATEX Zone 2 areas at low temperatures the cable and plug must be protected against impact.

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) |
| | 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 Pg 13.5, EN 175301-803-A | Plug Pg 9 – 11, EN 175301-803-A |
|-------------------------------|---------------------------------|
| | |

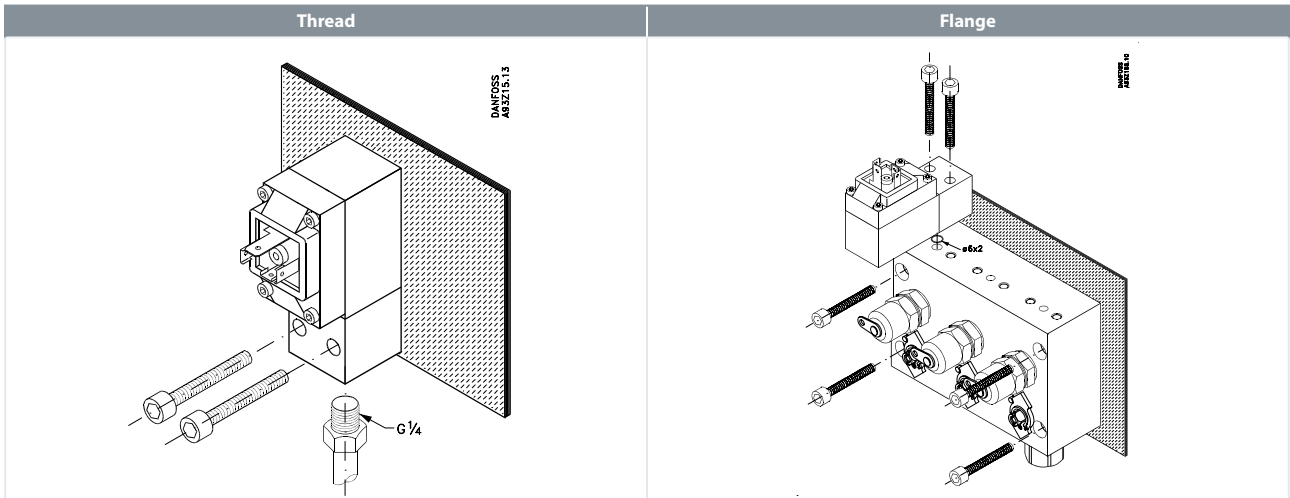
Electrical connections

Table 7: 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 8: Mechanical connection

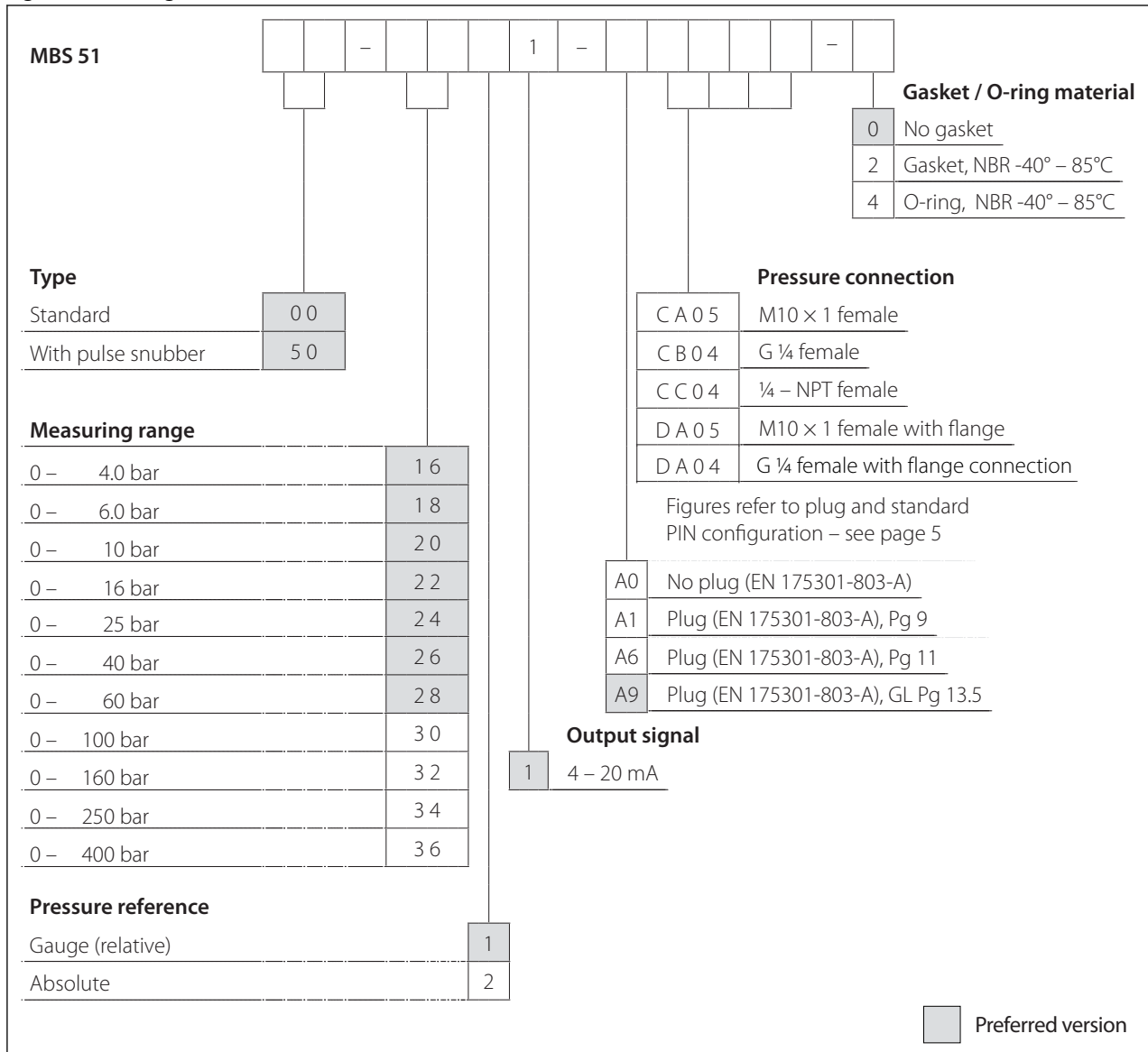


Ordering

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 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 |
|------------------------------------|-------------------------------------|---------------------|--------------------|
| 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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