Data sheet

Pressure transmitters for wind turbine applications Types MBS 8200 and MBS 8250

MBS 8200 is a series of compact pressure transmitters developed to withstand the pressure pulsations and vibrations known in wind turbine applications.

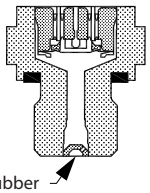
A new technology combining piezo resistive sensor element and programmable gain amplifiers makes the MBS 8200 the obvious choice for applications demanding highest accuracy and insensitiveness against temperature variations. Further this technology enhances the functional safety by limiting the output signal at excess pressure conditions, it allows excellent sink/source capabilities and it leave the pressure transmitters unaffected by electromagnetic fields up to 100 V/m.

MBS 8250 with integrated pulse-snubber is designed for use in hydraulic applications with severe media influences like cavitation, liquid hammer or pressure peaks, and offers a reliable pressure measurement, even under harsh environmental conditions.

Features

- Designed for use in harsh industrial environments
- EMC protection 100 V/m
- For media and ambient temperatures up to 125 °C
- Reverse polarity protected
- Version with integrated pulse-snubber. Protected against cavitation, liquid hammering and pressure peaks
- Enclosure and wetted parts of AISI 316L
- Digitally temperature calibrated
- RoHS conformity

MBS 8250



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 occour in liquids containing particles. Mounting the transmitter in an upright position minimizes the risk of clogging, because the flow in the nozzle is restricted to the start-up period when the dead volume behind the nozzle fills, and furthermore because the nozzle orifice is relatively big (0.4 mm). The media viscosity has only little effect on the response time. Even at viscosities up to 100 cSt, the response time will not exceed 4 ms.

Technical data

Performance (EN 60770)

Non-linearity BFSL (conformity)		≤ ± 0.2% FS
Hysteresis and repeatability		≤ ± 0.1% FS
Total error band inside the compensated temperature range		≤ ± 1% FS
Thermal shift outside the compensated temperature range		≤ ± 0.65% FS / 10 K
Response time MBS 8200 (10-90%)		< 2 ms
Response time MBS 8250 (10-90%)	Liquids with viscosity < 100 cSt	< 4 ms
	Air and gases	< 35 ms
Overload pressure (static)		Min. 6 × FS (max. 1400 bar)
Burst pressure		> 6 × FS (max. 2000 bar)
Durability, P: 10 – 90% FS		> 10 × 10^6 cycles

Electrical specifications

Nom. output signal (short curcuit protected)	4 – 20 mA (2-wire)
Supply voltage, U_B (polarity protected)	9 – 32 V d.c. > 32 V: Contact Danfoss
Supply voltage dependency	≤ ± 0.05% FS / 10 V
Current limitation (linear output signal up to 1.5 × rated range)	22 mA ± 0.5 mA
Load [R_L] (load connected to 0 V)	$R_L \leq \frac{U_B - 9\,V}{0.02\,A}$ [Ω]

Environmental conditions

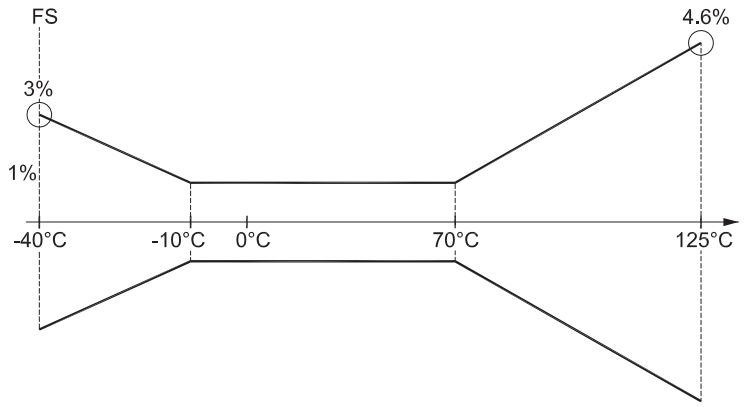
Media temperature range			-40 – 125 °C
Ambient temperature range			-40 – 105 °C
Compensated temperature span			Δ 80 °C
Compensated temperature range default			-10 – 70 °C
Storage temperature			-50 – 125 °C
EMC - Emission			EN 61000-6-3
EMC Immunity	RF Field	100 V/m, 20 MHz – 2 GHz	ISO 11452-2
		20 V/m, 2 GHz – 4 GHz	
Insulation resistance			> 100 MΩ at 500 V d.c.
Vibration stability	Sinusoidal	15.9 mm-pp, 5 Hz-25 Hz	IEC 60068-2-6
		25 g, 25 Hz - 2 kHz	
	Random	15 g_{rms}, 5 Hz – 1 kHz	IEC 60068-2-64
Shock resistance	Shock	500 g / 1ms	IEC 60068-2-27
	Free fall	1 m	IEC 60068-2-32
Enclosure (depending on electrical connection)			See page 5

Technical data
(continued)

Mechanical characteristics

Materials	Wetted parts	EN 10088-1; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1; 1.4404 (AISI 316 L)
	Pressure connection	EN 10088-1; 1.4404 (AISI 316 L)
	Electrical connections	See page 5
Net weight (depending on pressure connection)		< 0.07 kg

Total error band



Ordering

MBS 82

Type
Standard 00
With pulse snubber 50

Measuring range
0 - 6 bar 18
0 - 10 bar 20
0 - 16 bar 22
0 - 25 bar 24
0 - 40 bar 26
0 - 60 bar 28
0 - 100 bar 30
0 - 160 bar 32
0 - 250 bar 34
0 - 400 bar 36

Compensated temperature range
-10 to 70° C 21

Pressure Reference
Gauge (relative) 1
Absolute 2

Output signal
4 - 20 mA 1

Gasket
No gasket 0
Gasket, Viton, medium temp. -20°C-125°C 1

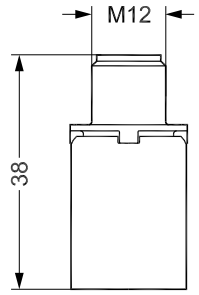
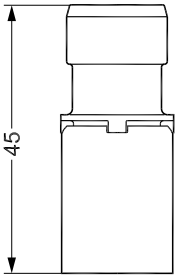
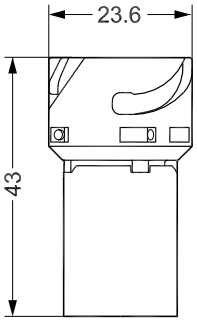
Pressure Connection
G1/4, DIN3852-E / ISO 1179-2 GB04
M14×1.5, ISO 6149-2 FA08

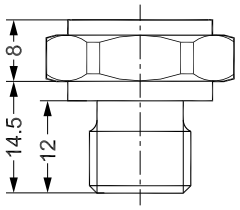
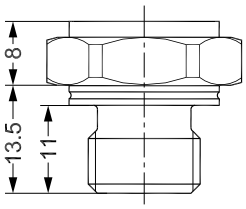
Electrical Connection
*M12x1, metal, IEC 947-5-2, 4 pin, Au, male, excl. female plug C1
Round Packard Metric-Pack 3-pin, Sn, male, excl. female plug C2
Bayonet, ISO 15170/DIN 72585-A1-3.1-Au, excl. female plug C6

* Sealed gauge versions

Please contact your local Danfoss office for further information or request on other versions.

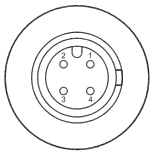
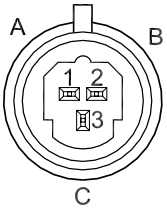
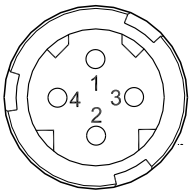
Dimensions/Combinations

Type code	C1	C2	C6
Electrical connections	M12 × 1, 4-pin, metal, Au	Round Packard, Sn	ISO 15170 A1-3.1 Au
Housing Ø = 19 mm			

Type code	GB04	FA08
Pressure connections	G1/4 - DIN 3852-E Gasket: DIN 3869-14	M14 x 1.5 - ISO 6149-2 O-ring
Hex is 22 mm across flats		
Recommended torque [1])	30 - 35 Nm	30 - 35 Nm

[1]) Depends of different parameters such as gasket material, mating material, thread lubrication and pressure level

Electrical connections

Type code	C1	C2	C6
Electrical connection	M12 × 1, 4 pin, Metal Au 	Round Packard, Sn 	ISO 15170 A1-3.1 Au 
Enclosure (IP protection fulfilled together with mating connector)	IP67	IP67	IP69K
Material	Glass filled polyamid, PA 6.6 Au coated contacts	Glass filled polyamide, PA 6.6 Sn coated contacts	Glass filled polyester, PBT Au coated contacts
Electrical connection, 4 – 20 mA output (2 wire)	Pin1: + supply Pin 2: - supply Pin 3: not used Pin 4: not used	Pin 1 (A): - supply Pin 2 (B): + supply Pin 3 (C): not used	Pin 1: + supply Pin 2: - supply Pin 3: not used Pin 4: not used