ENGINEERING TOMORROW

Data sheet

High temperature pressure transmitters for heavy-duty applications
MBS 2200 and MBS 2250

The compact heavy duty pressure transmitter type MBS 2200 and MBS 2250 are designed for use in severe industrial and hydraulic applications. MBS 2250 with integrated pulse-snubber is suitable for use in applications with severe medium influences like cavitation, liquid hammer or pressure peaks and offers a reliable pressure measurement, even under harsh environmental conditions.

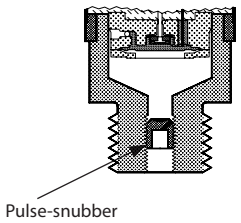
The flexible program of pressure transmitters with ratiometric output covers absolute or gauge (relative) versions, measuring ranges from 0 – 1 to 0 – 600 bar and a wide range of pressure and electrical connections.

A robust design, an excellent vibration stability and a high degree of EMC/EMI protection equip the pressure transmitter to meet the most stringent industrial requirements.

Features

- Designed for use in harsh industrial environments
- For medium and ambient temperatures up to 125 °C
- With integrated pulse-snubber
- Ratiometric output signal: 10 – 90% of supply voltage
- Enclosure and wetted parts of AISI 316L
- A wide range of pressure and electrical connections
- Temperature compensated, linearized and laser adjusted
- For use in Zone 2 explosive atmospheres

Application and media conditions (MBS 2250)



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.

Technical data

Performance (EN 60770)

Accuracy		≤ ± 0.5% FS (typ.)
		≤ ± 1.0% FS (max.)
Non-linearity (best fit straight line)		≤ ± 0.2% FS
Hysteresis and repeatability		≤ ± 0.1% FS
Thermal error band (compensated temperature range)		≤ ± 1.0% FS
Response time	Liquids with viscosity < 100 cSt	< 4 ms
	Air and gases (MBS 2250)	< 35 ms
Overload pressure (static)		Min. 6 × FS (max. 1500 bar)
Burst pressure		6 × FS (max. 2000 bar)
Durability, P: 10 – 90% FS		> 10 × 10^6 cycles

Electrical specifications

Nom. output signal	10 – 90% of supply voltage
Supply voltage [U_B], polarity protected	4.75 – 8 V DC 5 V DC (nom.)
Power consumption	≤ 5 mA at 5 V DC
Output impedance	≤ 25 Ω
Load [R_L] (load connected to ground)	R_L ≥ 10 kΩ at 5 V DC

Environmental conditions

Sensor temperature range		Normal	-40 – 125 °C
		ATEX Zone 2	-10 – 85 °C
Media temperature range			165 - (0.35 x ambient temperature)
Ambient temperature range (depending on electrical connection)			See page 5
Compensated temperature range			0 – 100 °C
Transport / storage temperature range			-50 – 125 °C
EMC – Emission			EN 61000-6-3
EMC – Immunity			EN 61000-6-2
Insulation resistance			> 100 MΩ at 100 V DC
Mains frequency test		500 V, 50 Hz	Based on SEN 361503
Vibration stability	Sinusoidal	20 g, 25 Hz – 2 kHz	IEC 60068-2-6
	Random	7.5 g_{rms}, 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 (depending on electrical connection)			See page 5

Technical data
(continued)

Explosive atmospheres

Zone 2 applications	CE Ex II 3G Ex nA IIA T3 Gc -20C<Ta<+85C	EN60079-0; EN60079-15

When used in ATEX Zone 2 areas at temperatures <-10 °C the cable and plug must be protected against impact.

Mechanical characteristics

Materials	Wetted parts	EN 10088-1; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1; 1.4404 (AISI 316 L)
	Electrical connections	See page 5
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

Ordering standard

MBS 2200
MBS 2250

Measuring range

0 – 1.0 bar	10
0 – 1.6 bar	12
0 – 2.5 bar	14
0 – 4.0 bar	16
0 – 6.0 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
0 – 600 bar	38

Pressure reference

Gauge (relative)	1
Absolute	2

Output signal

Ratiometric, 10 – 90%	6

Gasket / O-ring material

0	No gasket
1	Gasket, Viton -20 – 125 °C
3	O-ring, Viton -20 – 125 °C

Pressure connection

GB06	DIN 3852-A-G ⅜; excl. gasket
AB08	G ½ A (EN 837); excl. gasket
AC04	¼ –18 NPT excl. gasket
FA09	DIN 3852-E-M14 × 1.5, gasket: DIN 3869-14 NBR
GA12	DIN 3852-A-M18 × 1.5 excl. gasket
GB04	DIN 3852-E-G ¼, gasket: DIN 3869-14 NBR

Electrical connection

Figures refer to plug and standard PIN configuration see page 5

A1	Plug Pg 9 (EN175301-803-A)
A2	* Plug, AMP Econoseal, J series, male, excl. female plug
A3	Screened cable, 2 m
E3	* Plug, EN 60947-5-2, M12 × 1, 4 PIN male, excl. female plug
C8	Plug, ISO 15170-A1-3.2-Sn male, excl. female plug
A8	* Plug, AMP Superseal 1.5 series male, excl. female plug

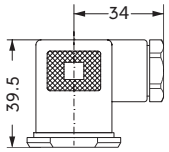
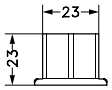
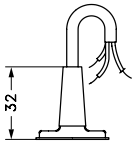
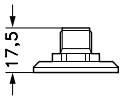
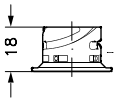
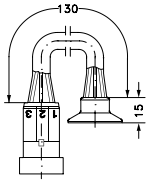
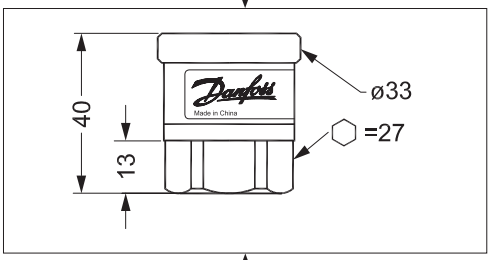
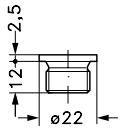
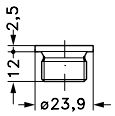
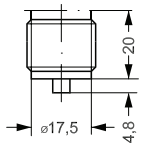
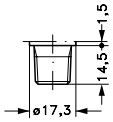
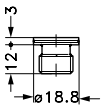
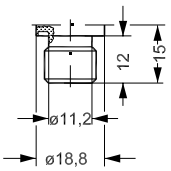
* Gauge versions only available as sealed gauge versions

Prefered version

Non-standard build-up combinations may be selected. However, minimum order quantities may apply.

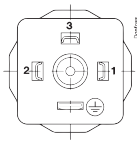
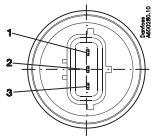
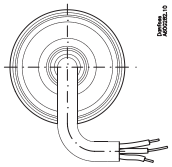
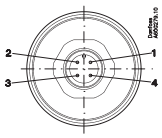
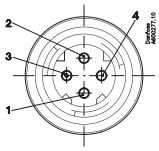
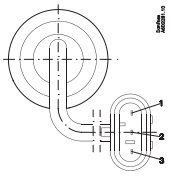
Please contact your local Danfoss office for further information or request on other versions.

Dimensions / Combinations

Type code	A1	A2	A3	E3	C8	A8
	EN175301-803-A, Pg 9	AMP Econoseal	2 m screened cable	EN 60947-5-2 4-pin; M 12 × 1	ISO 15170-A1-3.2-Sn (Bayonet plug)	AMP Superseal
						
						
						
	DIN 3852-A-G ⅜	DIN 3852-A M18 × 1.5	G ½ A (EN 837)	¼ – 18 NPT	DIN 3852-E-M14 × 1.5 Gasket: DIN 3869-14-NBR	DIN 3852-E-G ¼ Gasket: DIN 3869-14
Type code	**GB06**	**GA12**	**AB08**	**AC04**	**FA09**	**GB04**
Recommended torque[1])	30 – 35 Nm	30 – 35 Nm	30 – 35 Nm	2 – 3 turns after finger tightened	30 – 35 Nm	30 – 35 Nm

[1]) Depends on different parameters as packing material, mating material, thread lubrication and pressure level

Electrical connections

Type code, page 4	A1	A2	A3	E3	C8	A8
						
	EN 175301-803-A, Pg 9	AMP Econoseal J series (male)	2 m screened cable	EN 60947-5-2 M12 × 1; 4-pin	ISO 15170-A1-3.2-Sn (Bayonet plug)	AMP Superseal
Ambient temperature	-40 – 125 °C	-40 – 105 °C	-30 – 85 °C	-25 – 90 °C	-40 – 125 °C	-40 – 125 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67	IP67	IP67	IP67 / IP69K	IP67
Material	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6[1])	Poliolyfin cable with PE shrinkage tubing	Nickel plated brass, CuZn/Ni	Glass filled polyester, PBT	Glass filled polyamid, PA 6.6[2])
Electrical connection, Ratiometric output, 10 – 90% of supply voltage	Pin 1: + supply Pin 2: ÷ supply Pin 3: Output[3]) ⏚ Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply Pin 3: Output[3])	Brown wire: Output Black wire: ÷ supply Red wire: + supply[3]) Orange: Not used Screen: Not connected to MBS enclosure	Pin 1: + supply Pin 2: Not used Pin 3: Output Pin 4: ÷ supply[3])	Pin 1: + supply Pin 2: Output Pin 3: Ventilation Pin 4: ÷ supply[3])	Pin 1: + supply Pin 2: ÷ supply Pin 3: Output[3])

[1]) Female plug: Glass filled polyester, PBT

[2]) Wire: PTFE (teflon) Protection sleeve: PBT mesh (polyester)

[3]) Common