ENGINEERING
TOMORROW

Data sheet

Pressure transmitters for heavy duty applications
MBS 3200 and 3250

MBS 3200 MBS 3250

The compact high temperature pressure transmitter MBS 3200 is designed for use in hydraulic and almost all industrial applications, and offers a reliable pressure measurement, even under harsh environmental conditions.

MBS 3250 with integrated pulse-snubber is designed for use in hydraulic applications with severe medium influences like cavitation, liquid hammer or pressure peaks and offers a reliable pressure measurement, even under harsh environmental conditions.

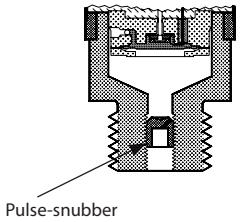
The flexible pressure transmitter programme covers different output signals, absolute or gauge (relative) versions, measuring ranges from 0 – 1 to 0 – 600 bar and a wide range of pressure and electrical connections.

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 and hydraulic environments
- For medium and ambient temperatures upto 125 °C
- With integrated pulse-snubber. Protected against cavitation, liquid hammering and pressure peaks (MBS 3250)
- All standard output signals: 4 – 20 mA, 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 - 10 V, 1 - 10 V
- 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 3250)



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 (incl. non-linearity, hysteresis and repeatability)		≤ ± 0.5% FS (typ.)
		≤ ± 1.0% FS (max.)
Non-linearity BFSL (conformity)		≤ ± 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 3250)	< 35 ms
Overload pressure (static)		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 (short-circuit protected)	4 – 20 mA	0 – 5, 1 – 5, 1 – 6 V d.c.	0 – 10 V, 1 – 10 V d.c.
Supply voltage [U_B], polarity protected	9 – 32 V d.c.	10 – 30 V d.c.	15 – 30 V d.c.
Supply – current consumption	–	≤ 5 mA	≤ 8 mA
Supply voltage dependency	≤ ± 0.1% FS / 10 V		
Current limitation	28 mA (typ.)	–	
Output impedance	–	≥ 25 kΩ	
Load [R_L] (load connected to 0 V)	$R_L \leq (U_B - 9\,V) / 0.02\,A$	$R_L \geq 10$ kΩ	$R_L \geq 15$ kΩ

Environmental conditions

Sensor temperature range (depending on gasket material)	Normal		-40 – 125 °C
	ATEX Zone 2		-10 – 85 °C
Max. media temperature			165 – (0.35 × 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 d.c.
Mains frequency test			Based on SEN 361503
Vibration stability	Sinusoidal	15.9 mm-pp, 5 Hz – 25 Hz	IEC 60068-2-6
		20 g, 25 Hz – 2 kHz	
	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	1m	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
	Pressure conncetion	See page 4
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

Ordering standard

MBS 3200
MBS 3250

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

4 – 20 mA	1
0 – 5 V	2
1 – 5 V	3
1 – 6 V	4
0 – 10 V	5
1 – 10 V	7

Gasket/O-ring material

0	No gasket (see pressure connections)
1	Viton (media temp.: -20 – 125° C)

Pressure connection

A B 0 4	G ¼ A (EN837) – MBS 3200
A B 0 8	G ½ A (EN837)
A C 0 4	¼ – 18 NPT
B C 0 8	½ – 14 NPT – MBS 3200
G A 1 2	DIN 3852-A M18 × 1.5, excl. gasket – MBS 3250
G B 0 4	DIN 3852-E-G ¼, gasket: DIN 3869-14 NBR
F A 0 9	DIN 3852-E-M 14 × 1.5, gasket: DIN 3869-14 NBR – MBS 3250

Electrical connection

1	Plug EN175301-803-A, Pg 9
2	* Plug, AMP Econoseal, J series, male, excl. female plug
3	Screened cable, 2 m
5	* Plug, EN 60947-5-2, M12 × 1, male, excl. female plug
8	* Plug, AMP Superseal 1.5 series male, excl. female plug

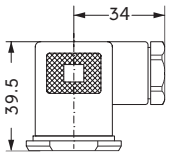
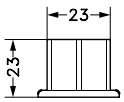
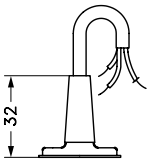
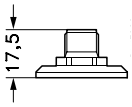
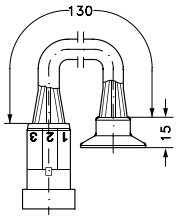
*Gauge versions only available as sealed gauge versions

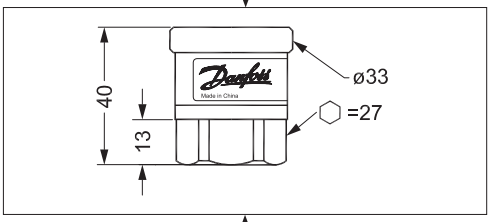
Prefered version

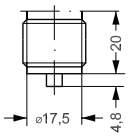
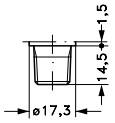
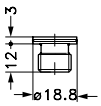
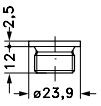
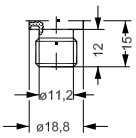
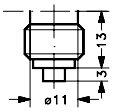
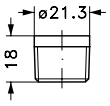
Non-standard build-up combinations may be selected. However, minimum order quantities may apply.

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

Dimensions/Combinations

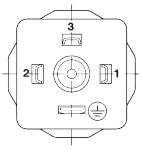
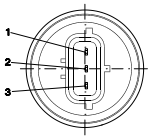
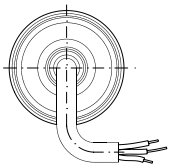
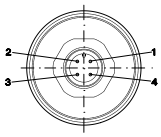
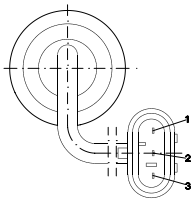
Type code	1	2	3	5	8
	EN175301-803-A, Pg 9	AMP Econoseal	2 m screened cable	EN 60947-5-2 M12 x 1, 4 Pin	AMP Superseal
					



							
	G ½ A (EN 837)	¼ – 18 NPT	DIN 3852-E-M 14 × 1.5 Gasket: DIN 3869-14-NBR	DIN 3852-A-M 18 × 1.5, excl. gasket	DIN 3852-E-G ¼ Gasket: DIN 3869-14-NBR	G ¼ A (EN837)	½ - 14 NPT
Type code	**AB08**	**AC04**	**FA09**	**GA12**	**GB04**	**AB04**	**AC08**
Recommended torque [1]	30 – 35 Nm	2 – 3 turns after finger tightened	30 – 35 Nm	30 – 35 Nm	30 – 35 Nm	30 – 35 Nm	2 – 3 turns after finger tightened

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

Electrical connections

Type code	1	2	3	5	8
	 EN 175301-803-A, Pg 9	 AMP Econoseal J series (male)	 2 m screened cable	 EN 60497-5-2 M12 x 1, 4 Pin	 AMP Superseal 1.5 series (male)
Ambient temperature, 4 – 20 mA output	-40 – 100 °C	-40 – 100 °C	-30 – 85 °C	-25 – 90 °C	-40 – 100 °C
Ambient temperature, 0 – 5V, 1 – 5 V, 1 – 6 V, 0 –10 V, output	-40 – 125 °C	-40 – 105 °C	-30 – 85 °C	-25 – 90 °C	-40 – 125 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67	IP67	IP67	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 polyamid, PA 6.6 [2]
Electrical connection, 4 – 20 mA output (2 wire)	Pin1: + supply Pin 2: ÷ supply Pin 3: not used Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply Pin 3: not used	Brown wire: + supply Black wire: ÷ supply Red wire: not used Orange: Not used Screen: Not connected to MBS enclosure	Pin 1: + supply Pin 2: not used Pin 3: not used Pin 4: ÷ supply	Pin 1: + supply Pin 2: ÷ supply Pin 3: not used
Electrical connection, 0 – 5V, 1 – 5 V, 1 – 6 V, 0 –10 V, 1 – 10 V output	Pin 1: + supply Pin 2: ÷ supply [3] Pin 3: + output Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply [3] Pin 3: + output	Brown wire: + output Black wire: ÷ supply [3] Red wire: + supply 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: ÷ supply [3] Pin 3: + output

[1]) Female plug: Glass filled polyester, PBT
[2]) Wire: PTFE (teflon) Protection sleeve: PBT mesh (polyester)
[3]) Common