

Pressure transmitter for heavy-duty applications

Type MBS 2050

Features



- Designed for use in severe industrial environments
- Resistant to cavitation, liquid hammer and pressure peaks
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- Pressure ranges in relative (gauge) or absolute from 0 up to 600 bar
- Ratiometric output signal: 10-90% of supply voltage
- A wide range of pressure and electrical connections
- Temperature compensated and laser calibrated

Description

The compact heavy duty pressure transmitter MBS 2050 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 program of pressure transmitters with ratiometric output signal cover, absolute and

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.

Ordering standard versions

Plug: Pg 9 (EN 175301-803)
Ratiometric output 10-90% of supply voltage

Pressure Connection	Pressure range Pe ¹⁾ [bar]	Type	Code no.
DIN 3852-G 1/4A NBR, O-ring	0 - 160	MBS 2050 3216-1FB04	060G1404
	0 - 250	MBS 2050 3416-1FB04	060G1405
	0 - 400	MBS 2050 3616-1FB04	060G1406
	0 - 600	MBS 2050 3816-1FB04	060G1407

¹⁾ Relative/gauge

Technical data

Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)	±0.3% FS (typ.) ±1% FS (max.)
Non-linearity BFSL (conformity)	≤ ±0.2% FS
Hysteresis and repeatability	≤ ±0.1% FS
Thermal zero point shift	≤ ±0.1% FS/10K (typ.) ≤ ±0.2% FS/10K (max.)
Thermal sensitivity (span) shift	≤ ±0.1% FS/10K (typ.) ≤ ±0.2% FS/10K (max.)
Response time	Liquids with viscosity < 100 cSt
	Air and gases
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	10 - 90% of V _{supply}
Supply voltage V _{supply} (polarity protected)	4.75 to 8 V d.c. 5 V d.c. (nom.)
Power consumption	<5mA at 5 V d.c
Output impedance	<25 Ω
Load resistance RL	RL > 5 kΩ at 5 V d.c.

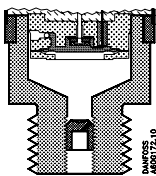
Environmental conditions

Medium temperature range	-40 → +85°C
Ambient temperature range (depending on electrical connection)	see page 4
Compensated temperature range	0 → +80°C
Transport temperature range	-50 → +85°C
EMC - Emission	EN 61000-6-3
EMC Immunity	EN 61000-6-2
Insulation resistance	> 100 MΩ at 100 V
Mains frequency test	SEN 361503
Vibration stability	Sinusoidal
	Random
Shock resistance	Shock
	Free fall
Enclosure (depending on electrical connection)	see page 4

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 4
Weight (depending on pressure connection and electrical connection)		0.2 - 0.3 kg

Application and media conditions



Application

Cavitation, liquid hammer and pressure peaks may occur in liquid filled 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 restricted to the start-up period when the dead volume behind the nozzle fills, and furthermore because the nozzle orifice is relatively big (0.3 mm). 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.

Ordering of special versions

MBS 2050-		6-		
Measuring range				Pressure connection
0 - 1 bar.....	1 0			G 1/2 A (EN 837)
0 - 1.6 bar.....	1 2			1/4 -18 NPT
0 - 2.5 bar.....	1 4			DIN 3852/3, M18X1,5 - 6g, NBR O-ring
0 - 4 bar.....	1 6			9/16 - 18 UNF - 2A (SAE J514) NBR O-ring
0 - 6 bar.....	1 8			DIN 3852-E-G 1/4 Gasket: DIN 3869-14 NBR
0 - 10 bar.....	2 0			
0 - 16 bar.....	2 2			
0 - 25 bar.....	2 4			
0 - 40 bar.....	2 6			
0 - 60 bar.....	2 8			
0 - 100 bar.....	3 0		1	Electrical connection
0 - 160 bar.....	3 2		2	Figures refer to plug and standard PIN configuration - see page 4
0 - 250 bar.....	3 4		3	Plug Pg 9 (EN175301-803)
0 - 400 bar.....	3 6		5	Plug, AMP Econoseal, J series, male, excl. female plug
0 - 600 bar.....	3 8		6	Screened cable, 2 m
			8	Plug, IEC 60947-5-2, M12 x 1, male, excl. female plug
				Plug Pg 11 (EN 175301-803)
				Plug, AMP Superseal 1.5 series male, excl. female plug
Pressure reference				Output signal
Gauge (relative).....	1	6		Ratiometric, 10-90%
Absolute.....	2			

■ Preferred version

* Gauge versions only available as sealed gauge versions

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	6	8
	EN175301-803, Pg 9	AMP Econoseal	2 m screened cable	EN 60947 - 5 - 2 M12x1; 4-pin	EN 175301-803, Pg 11	AMP Superseal
	9/16 -18 UNF-2A (SAE J514)	G 1/2 A (EN 837)	1/4 - 18 NPT	DIN 3852/3, M 18x105-6g NBR O-ring	DIN 3852-E-G 1/4 Gasket: DIN 3869-14	
Type code	FD10	AB08	AC04	FA12	GB04	

Electrical connections

Type code, page 3					
1	2	3	5	6	8
EN 175301-803, Pg 9	AMP Econoseal J series (male)	2 m screened cable	EN 60947-5-2 M12x1; 4-pin	EN 175301-803, Pg 11	AMP Superseal 1.5 series (male)
<i>Ambient temperature</i>					
-40 → +85 °C	-40 → +85 °C	-30 → +85 °C	-25 → +85 °C	-40 → +85 °C	-40 → +85 °C
<i>Enclosure</i>					
IP 65	IP 67	IP 67	IP 67	IP 65	IP 67
<i>Materials</i>					
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	Glass filled polyamid, PA 6.6 ²⁾
<i>Electrical connection, Ratiometric output, 10-90% of supply voltage</i>					
Pin 1: + supply Pin 2: ÷ supply Pin 3: Output Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply Pin 3: Output	Brown wire: Output Black wire: ÷ supply 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	Pin 1: + supply Pin 2: - supply Pin 3: Output Earth: Connected to MBS enclosure	Pin 1: + supply Pin 2: ÷ supply Pin 3: Output

- 1) Female plug: Glass filled polyester, PBT
- 2) Wire: PETFE (teflon)
Protection sleeve: PBT mesh (polyester)