



Pressure transmitters for heavy-duty applications

Type MBS 4050

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
- All standard output signals: 4 - 20 mA, 0 - 5 V, 1 - 5 V, 1 - 6 V, 0 - 10 V
- A wide range of pressure and electrical connections
- Temperature compensated and laser calibrated

Application

The standard heavy duty pressure transmitter MBS 4050 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 and

gauge (relative) versions, measuring ranges from 0-1 to 0-600 bar and a wide range of pressure and electrical connections.

Excellent vibration stability, robust construction, 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-A)

Output: 4-20 mA

Pressure connection	Measuring range P_e ¹⁾ [bar]	Type no. ²⁾	Code no.
G ½A (EN837)	0 - 4	MBS 4050 1611-1EB08	060G3266
	0 - 6	MBS 4050 1811-1EB08	060G3267
	0 - 10	MBS 4050 2011-1EB08	060G3268
	0 - 16	MBS 4050 2211-1EB08	060G3269
	0 - 25	MBS 4050 2411-1EB08	060G3270
	0 - 40	MBS 4050 2611-1EB08	060G3271
	0 - 60	MBS 4050 2811-1EB08	060G3272
	0 - 100	MBS 4050 3011-1EB08	060G3273
	0 - 160	MBS 4050 3211-1EB08	060G3274
	0 - 250	MBS 4050 3411-1EB08	060G3275
	0 - 400	MBS 4050 3611-1EB08	060G3276
DIN 3852-G ¼ A	0 - 600	MBS 4050 3811-1EB08	060G3277
	0 - 160	MBS 4050 3211-1FB04	060G3380
	0 - 250	MBS 4050 3411-1FB04	060G3381
	0 - 400	MBS 4050 3611-1FB04	060G3382
	0 - 600	MBS 4050 3811-1FB04	060G3383

¹⁾ Relative / gauge

²⁾ Pressure port code EB08 = AB08

Pressure port code FB04 ~ GB04

Technical data
Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)	±0.3% FS (typ.) ±0.8% 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	< 4 ms
	Air and gases	< 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	0 - 10 V
Supply voltage [U _B], polarity protected	10 → 30 V	9 → 30 V	15 → 30 V
Supply - current consumption	–	≤ 5 mA	≤ 8 mA
Supply voltage dependency	≤ ±0.05% FS/10 V		
Current limitation	28 mA (typ.)	–	
Output impedance	–	≤ 25Ω	
Load [R _L] (load connected to 0V)	R _L ≤ (U _B -10V)/0.02A	R _L ≥ 10 kΩ	R _L ≥ 15 kΩ

Environmental conditions

Media temperature range	–40 → +85°C		
Ambient temperature range (depending on electrical connection)	see page 5		
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	15.9 mm-pp, 5 Hz-25 Hz	IEC 60068-2-6
		20 g, 25 Hz - 2 kHz	
Shock resistance	Random	7.5 g _{rms} , 5Hz-1kHz	IEC 60068-2-64
	Shock	500 g / 1 ms	IEC 60068 - 2 - 27
	Free fall		IEC 60068 - 2 - 32
Enclosure (depending on electrical connection)	see page 5		

Mechanical characteristics

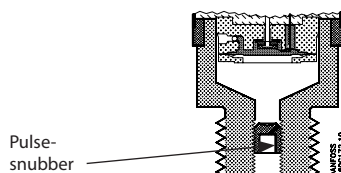
Materials	Wetted parts	EN 10088-1; 1.4404 (AISI 316 L)
	Enclosure	EN 10088-1; 1.4404 (AISI 316 L)
	Electrical connections	see page 5
Weight (depending on pressure connection and electrical connection)	0.2 - 0.3 kg	

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, Special versions

Preferred 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.

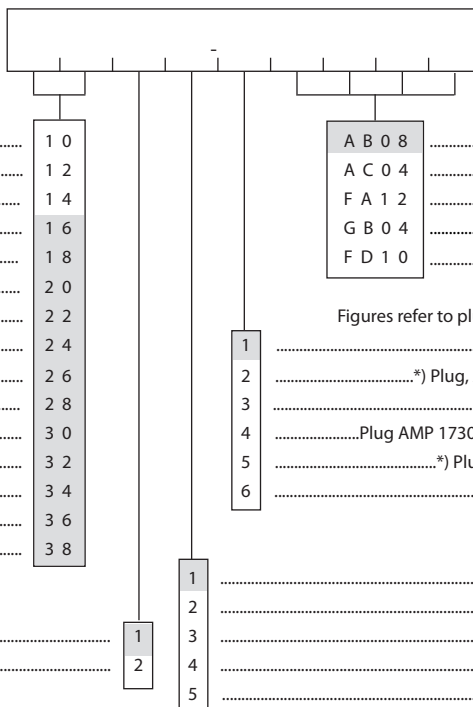
MBS 4050 -

Measuring range

0 - 1 bar.....	1 0
0 - 1.6 bar.....	1 2
0 - 2.5 bar.....	1 4
0 - 4 bar.....	1 6
0 - 6 bar.....	1 8
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
0 - 160 bar.....	3 2
0 - 250 bar.....	3 4
0 - 400 bar.....	3 6
0 - 600 bar.....	3 8

Pressure reference

Gauge (relative).....	1
Absolute.....	2



Pressure connection

A B 0 8.....	G ½ A (EN 837)
A C 0 4.....	¼ -18 NPT
F A 1 2.....	DIN 3852/3, M18x1.5 - 6g, NBR
G B 0 4.....	DIN 3852-E-G ¼ A, gasket DIN 3869-14 NBR
F D 1 0.....	9/16 -18 UNF-2A (SAE J514), NBR

Electrical connection

Figures refer to plug and standard PIN configuration - see page 5

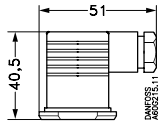
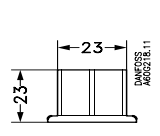
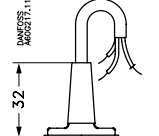
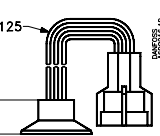
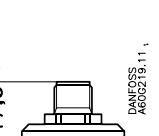
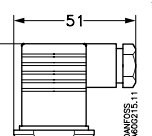
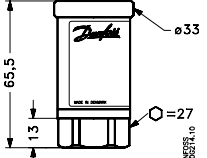
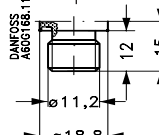
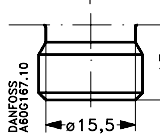
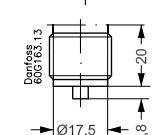
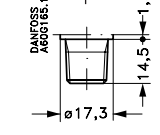
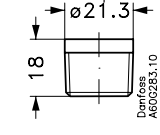
1.....	Plug Pg 9 (EN175301-803-A)
2.....	*) Plug, AMP Econoseal, J-series, male excl. female plug
3.....	Screened cable, 2 m
4.....	Plug AMP 173065, male flying leads 125 mm excl. female plug
5.....	*) Plug, IEC 947-5-2, M12 x 1, male excl. female plug
6.....	Plug Pg 11 (EN 175301-803-A)

Output signal

1.....	4-20 mA
2.....	0-5 V d.c.
3.....	1-5 V d.c.
4.....	1-6 V d.c.
5.....	0-10 V d.c.

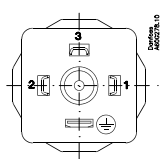
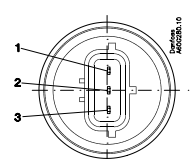
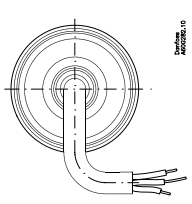
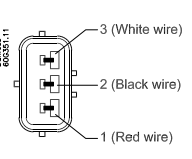
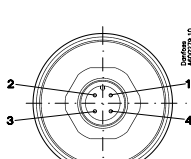
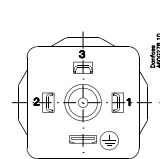
*) Gauge versions only available as selased gauge versions

Dimensions/combinations

Type code	1	2	3	4	5	6
	EN175301-803-A, Pg9	AMP Econoseal	2 m screened cable	AMP 173065, male, Flying leads, 125 mm	IEC 60947-5-2 4 pin M12x1	EN 175301-803-A, Pg11
						
						
						
	DIN 3852-E-G ¼ A gasket DIN 3869-14 NBR	DIN 3852/3 M18x1.5 -6g NBR, O-ring	G ½ A (EN 837)	¼-18 NPT	9/16-18 UNF-2A (SAE J514) NBR, O-ring	
Type code	GB04	FA12	AB08	AC04	FD10	
Recommended torque 1)	30-35 Nm	30-35 Nm	30-35 Nm	2-3 turns after finger tightened	30-35 Nm	

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

Electrical connections

Type code page 4					
1	2	3	4	5	6
EN 175301-803, Pg9 	AMP Econoseal J series (male) 	2 m screened cable 	AMP 173065, male Flying leads 125 mm 	EN 60497-5-2 4 pin M12 x 1 	EN 175301-803-A, Pg11 
Ambient temperature					
-40 to +85 °C	-40 to +85 °C	-30 to +85 °C	-40 to +85 °C	-25 to +85 °C	-40 to +85 °C
Enclosure (IP protection fulfilled together with mating connector)					
IP 65	IP 67	IP 67	IP 67	IP 67	IP 65
Materials					
Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6 ¹⁾	Poliolyfin cable with PE shrinkage tubing	Glass filled polyester, PBT	Nickel plated brass, CuZn/Ni	Glass filled polyamid, PA 6.6
Electrical connection, 4-20 mA output (2 wire)					
Pin 1: +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 (red): +supply Pin 2 (black): -supply Pin 3: Not used	Pin 1: +supply Pin 2: Not used Pin 3: Not used Pin 4: ÷supply	Pin 1: +supply Pin 2: ÷supply Pin 3: Not used Earth: Connected to MBS enclosure
Electrical connection, 0-5V, 1-5V, 1-6V, 0-10V output					
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 (red): +supply Pin 2 (black): -supply Pin 3 (white): +output	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

¹⁾ Female plug: Glass filled polyester, PBT