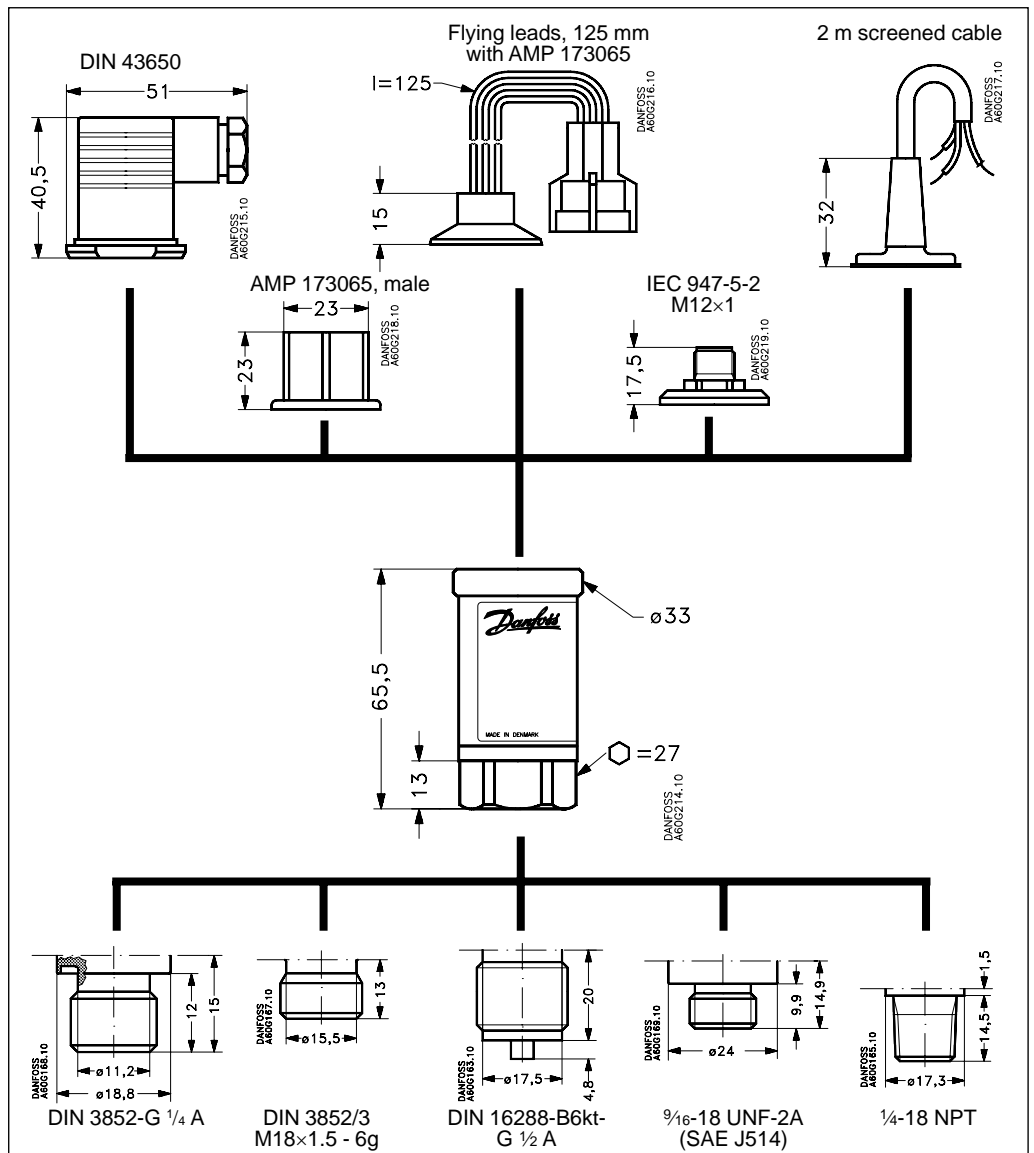


Heavy-duty Pressure Transmitters, type MBS 4050



- Resistant to cavitation, liquid hammer and pressure peaks
- Overload pressure 10-20× measuring range
- Durability: >10 million cycles
- For use in severe industrial environments:
 - High vibration stability
 - IP 67 versions available
 - Wetted parts and enclosure of acid resistant steel
- CE-marked: EMC protected in accordance with EU EMC directive
- Temperature compensated, linearized and laser calibrated
- 4-20 mA, 0-5 V, 1-5 V, 1-6 V or 0-10 V output signal

Dimensions



Technical data

Performance (IEC 770)

Accuracy (at reference conditions)	±0.5% FS (typ.) ±0.8% FS
Non-linearity (Best fit straight line)	< ±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)	< 4 ms
Overload (static) and burst pressure	10-20×FS - depending on measuring range Max overload: 1500 bar Max. burst: 2000 bar
Durability, P: 10-90% FS	>10×10 ⁶ cycles

Electrical specifications for 4-20 mA output signal

Nom. output signal	4 to 20 mA
Supply voltage, V_{supply} (polarity protected)	10 to 30 V d.c.
Voltage dependency	< 0.05% FS/10K
Current limitation (linear output signal up to 1.5 × nom. range)	28 mA
Max load R_L (field of operation)	$R_L \leq \frac{V_{\text{supply}} - 10 \text{ V}}{0.02 \text{ A}}$ [Ω]

Electrical specifications for 0-5 V, 1-5 V, 1-6 V and 0-10 V output signal

Nom. output signal (short-circuit protected)	0-5, 1-5, 1-6 V d.c.	0-10 V d.c.
Supply voltage, V_{supply} (polarity protected)	9 to 30 V d.c.	15 to 30 V d.c.
Supply – current consumption	< 5 mA	< 8 mA
Supply voltage dependency	< 0.05% FS/10V	
Output impedance	< 25 Ω	
Load resistance R_L	$R_L > 10 \text{ k}\Omega$	$R_L > 15 \text{ k}\Omega$

Environmental conditions

Operating temperature range	-40 to 85°C		
Compensated temperature range	0 to 80°C		
Transport temperature range	-50 to 85°C		
EMC - Emission	EN 50081-1		
EMC - Immunity	Electrostatic discharge	Air mode 8 kV	EN 50082-2 (IEC 801-2)
		Contact mode 4 kV	EN 50082-2 (IEC 801-2)
	RF field	10 V/m, 26 MHz - 1 GHz	EN 50082-2 (IEC 801-3)
		conducted 10 V _{rms} , 150 kHz - 30 MHz	EN 50082-2 (IEC 801-6)
	Transient	burst 4 kV (CM), Clamp	EN 50082-2 (IEC 801-4)
surge 1 kV (CM,DM), Rg = 42 Ω		EN 50082-2 (IEC 801-5)	
Insulation resistance	> 100 M Ω at 100 V d.c.		
Mains frequency test	500 V, 50 Hz	SEN 361503	
Vibration stability	Sinusoidal	20 g, 25 Hz - 2 kHz	IEC 68-2-6
	Random	7,5 g _{rms} , 5 Hz - 1 kHz	IEC 68-2-34, IEC 68-2-36
Shock resistance	Shock	500 g / 1 ms	IEC 68-2-27
	Free fall		IEC 68-2-32
Enclosure	DIN 43650 Plug		IP 65 - IEC 529
	IEC 947-5-2, M12×1		IP 67 - IEC 529
	AMP 173065		IP 67 - IEC 529
	2 m cable		IP 67 - IEC 529

Mechanical characteristics

Materials	Wetted parts	DIN 17440-1.4404 (AISI 316 L)
	Enclosure	DIN 17440-1.4404 (AISI 316 L)
Weight	0.2 kg	

Application and media conditions

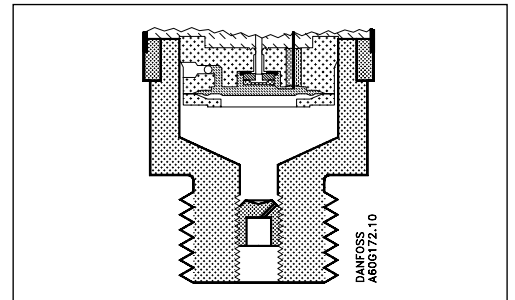
MBS 4050 with integrated pulse-snubber is specially suited for hydraulic applications where cavitation, liquid hammer or pressure peaks may occur – influences that often cause a short but extreme excess of the measuring range of the transmitter.

The integrated pulse-snubber is in principle designed as a nozzle mounted in the passage between the measured medium and the pressure sensitive element of the transmitter.

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.



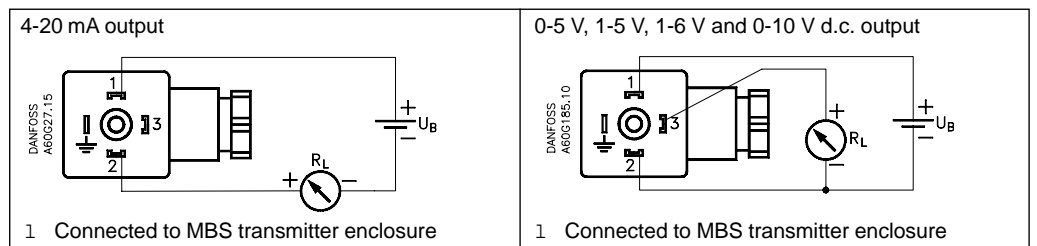
Media condition

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 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.

Pressure connections

Dimensions					
Pressure connection	DIN 3852-G 1/4 A	DIN 3852/3 M18 x 1.5 - 6g	DIN 16288-B6kt-G 1/2 A	9/16-18 UNF-2A (SAE J514)	1/4-18 NPT
PN	630 bar	630 bar	630 bar	630 bar	630 bar
Gasket	O-ring, 13.3x1.8, NBR	O-ring, 15.4x2.1, NBR		O-ring, 12x2, NBR	
Type no.	MBS4050-XXXX-XFB04	MBS4050-XXXX-XFA12	MBS4050-XXXX-XEB08	MBS4050-XXXX-XFD10	MBS4050-XXXX-XEC04

**Electrical connections
DIN 43650
(Others on request)**



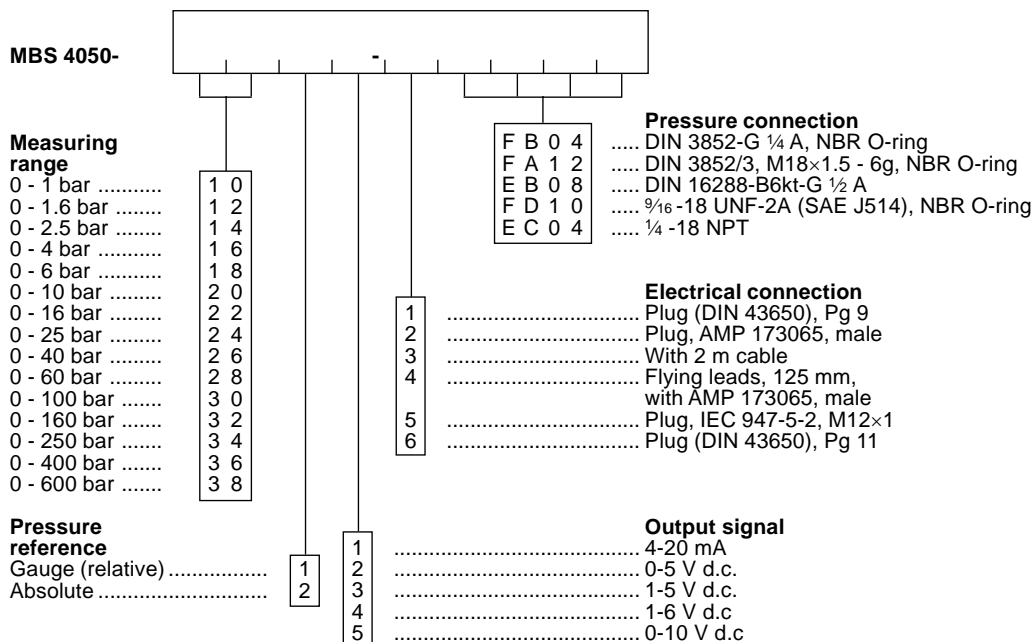
**Ordering
Standard version with
DIN 43650 plug and
4-20 mA output**

Pressure connection	Pressure range P _e	Type no.	Code no.
DIN 3852-G 1/4 A	0 - 160 bar	MBS 4050 3211-1FB04	060G3380
	0 - 250 bar	MBS 4050 3411-1FB04	060G3381
	0 - 400 bar	MBS 4050 3611-1FB04	060G3382
	0 - 600 bar	MBS 4050 3811-1FB04	060G3383

**Ordering
Standard version with
DIN 43650 plug and
4-20 mA output**

Pressure connection	Pressure range P _e	Type no.	Code no.
DIN 316288-B 6kt-G 1/2A	0 - 4 bar	MBS 4050 1611-1EB08	060G3266
	0 - 6 bar	MBS 4050 1811-1EB08	060G3267
	0 - 10 bar	MBS 4050 2011-1EB08	060G3268
	0 - 16 bar	MBS 4050 2211-1EB08	060G3269
	0 - 25 bar	MBS 4050 2411-1EB08	060G3270
	0 - 40 bar	MBS 4050 2611-1EB08	060G3271
	0 - 60 bar	MBS 4050 2811-1EB08	060G3272
	0 - 100 bar	MBS 4050 3011-1EB08	060G3273
	0 - 160 bar	MBS 4050 3211-1EB08	060G3274
	0 - 250 bar	MBS 4050 3411-1EB08	060G3275
	0 - 400 bar	MBS 4050 3611-1EB08	060G3276
	0 - 600 bar	MBS 4050 3811-1EB08	060G3277

**Ordering,
Special versions**



Danfoss pressure transmitter programme

Danfoss Pressure and Temperature Controls offers the following product programme of Heavy-duty Transmitters:

Data Sheets:

- Heavy-duty Transmitters, type MBS 2050 IK.21.I1.—
- Heavy-duty Transmitters, type MBS 3050 IK.21.J1.—
- Heavy-duty Transmitters, type MBS 5050 IK.21.K1.—

Articles:

- The Liquid (Water) Hammer Phenomena IH.20.C1.—

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