



Pressure transmitter

MBS 3000 / MBS 3050

For general industrial purposes

Description

The compact pressure transmitter, type MBS 3000, is designed for use in industrial and hydraulic applications, and offers a reliable pressure measurement, even under harsh environmental conditions.

The compact heavy duty pressure transmitter MBS 3050 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. A wide range of pressure and electrical connections are available.

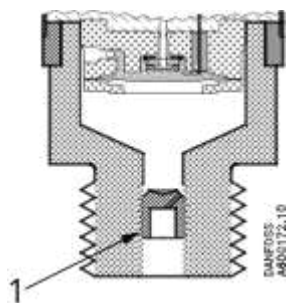
Excellent vibration stability, robust construction, and a high degree of EMC/EMI protection equip the pressure transmitter to meet the most stringent industrial requirements.

Features & benefits

- Designed for use in severe industrial and hydraulic environments
- Resistant to cavitation, liquid hammer and pressure peaks (MBS 3050)
- 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, 1 – 10 V, Ratiometric output signal: 10-90% of supply voltage
- A wide range of pressure and electrical connections
- Fully digitally compensated
- For use in ATEX zone 2 explosive atmospheres
- UL approved

Applications

Application and media conditions for MBS 3050



1 Pulse-snubber

Application for MBS 3050

Cavitation, liquid hammer and pressure peaks may occur in hydraulic systems with changes in flow velocity, e.g. fast closing of a valve or when a pump starts and stops.

The problem may occur on the inlet and outlet side of the application, even at rather low operating pressures.

Media condition for MBS 3050

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.

Product code numbers

[illegible]

Product details

General data

Performance (EN 60770)

Accuracy (incl. non-linearity, hysteresis and repeatability)	$\leq \pm 0.5\% \text{ FS (typ.)}$
	$\leq \pm 1\% \text{ FS (max.)}$
Non-linearity BFSL (conformity)	$\leq \pm 0.2\% \text{ FS}$
Hysteresis and repeatability	$\leq \pm 0.1\% \text{ FS}$
Thermal zero point shift	$\leq \pm 0.1\% \text{ FS} / 10\text{K (typ.)}$
	$\leq \pm 0.2\% \text{ FS} / 10\text{K (max.)}$
Thermal sensitivity (span) shift	$\leq \pm 0.1\% \text{ FS} / 10\text{K (typ.)}$
	$\leq \pm 0.2\% \text{ FS} / 10\text{K (max.)}$
Response time: Liquids with viscosity < 100 cSt	< 4 ms
Response time: Air and gases (MBS 3050)	< 35 ms
Overload pressure (static)	6 × FS (max. 1500 bar)
Burst pressure	6 × FS (max. 2000 bar)
Power-up time	< 50 ms
Durability, P: 10 – 90% FS	> 10 × 10 ⁶ cycles
MTTFd - Calculation based on the SN 29500	> 100 years

Electrical specifications

Nom. output signal (short-circuit protected)	4 – 20 mA	0 – 5, 1 – 5, 1 – 6 V	0 – 10 V, 1 – 10 V	Ratiometric 10 – 90% of [U _B]
Supply voltage [U _B], polarity protected	9 – 32 V DC	9 – 32 V DC	15 – 32 V DC	4.5 – 5.5 V DC
Supply – current consumption	–	≤ 5 mA	≤ 8 mA	≤ 5 mA at 5 V DC
Supply voltage dependency	< 0.1% FS / 10 V	< 0.05% FS / 10 V		–
Ratiometricity	–	–		< 0.05% FS / 4.5 – 5.5 V
Output limitation	22.4 mA	0-5 V: 5.75 V 1-5 V: 5.6 V 1-6 V: 6.75 V	0-10V: 11.5 V	≈ supply voltage
Sink / Source	–	< 1 mA		
Load [R _L] (load connected to 0 V)	R _L ≤ (U _B - 9 V) / 0.02 A	R _L ≥ 10 kΩ	R _L ≥ 15 kΩ	R _L ≥ 10 kΩ at 5 V DC

Environmental conditions

Sensor operating temperature	Normal	-40 – 85 °C	
	ATEX Zone 2	-20 – 85 °C	
Media temperature range		-40 – 85 °C	
Ambient temperature range (depending on electrical connection)		See Electrical connections	
Compensated temperature range		0 – 80 °C	
Transport/storage temperature range		-50 – 85 °C	
EMC – Emission		EN 61000-6-3	
EMC – Immunity		EN 61000-6-2	
Insulation resistance		> 100 MΩ at 500 V DC	
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	1 m	IEC 60068-2-32
Enclosure (depending on electrical connection)		See Electrical connections	

Explosive atmospheres

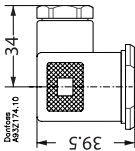
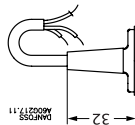
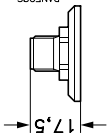
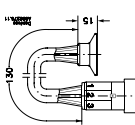
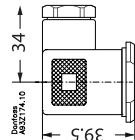
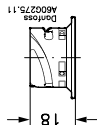
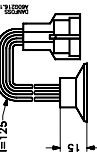
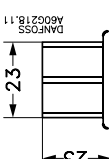
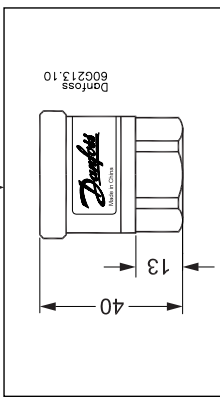
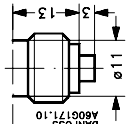
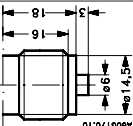
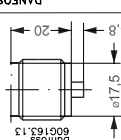
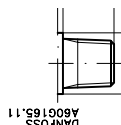
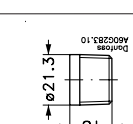
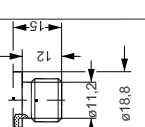
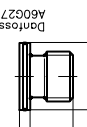
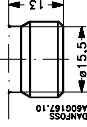
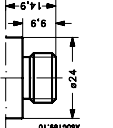
Zone 2 applications ⁽¹⁾	  II 3G Ex ec IIA T3 Gc -20°C < Ta < +85°C	EN60079-0; EN60079-7
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⁽¹⁾When used in ATEX Zone 2 areas at low temperatures the cable and plug must be protected against impact.

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 Electrical connections
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

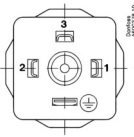
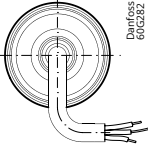
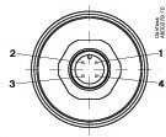
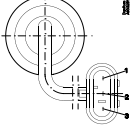
Dimensions / Combinations

Type code	A1	A3	E3	A8	A6	C8	D9	G1	
	EN175301-803-A, Pg 9	2 m screened cable	IEC 61076-2-101 M12 x 1; 4-pin	AMP Superseal	EN175301-803-A Pg 11	ISO 15170-A1-3.2-SN	AMP 173065, male, Flying leads	AMP Econoseal	
									
									
									
									
									
									
									
									
									
									
									
Type code	AB04	AB06	AB08	AC04	AC08	GB04	FA09	FA12	FD10
Recommended torque ¹⁾	30 - 35 Nm	30 - 35 Nm	30 - 35 Nm	2 - 3 turns after finger tightened	2 - 3 turns after finger tightened	30 - 35 Nm	30 - 35 Nm	30 - 35 Nm	30 - 35 Nm
	G 1/4 A (EN 837)	G 3/8 A (EN 837)	G 1/2 A (EN 837)	1/4 - 18 NPT	1/2 - 14 NPT	G 1/4 R (DIN 3852-E)	M 18 x 1.5 - 6 g (ISO 261)	% ₁₆ - 18 UNF-2A (SAE J514)	

Note: Dimensions are in mm, unless stated otherwise.

Connections

Electrical connections

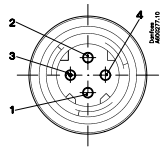
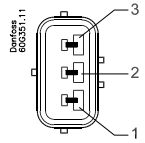
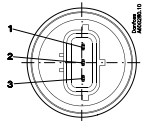
Type code	A1 & A6	A3 & A0	E3	A8
	 EN 175301-803-A, Pg 9 & Pg 11	 2 m screened cable	 IEC 61076-2-101 M12 x 1; 4-pin	 AMP Superseal 1.5 series (male)
Ambient temperature	-40 – 85 °C	-30 – 85 °C	-25 – 90 °C	- 30 – 85 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67	IP67	IP67
Atex Zone 2 enclosure	IP54			
Material	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	Brown wire: + supply Black wire: ÷ supply Red wire: not used Orange: not used Screen: not connected to MBS enclosure	Pin1: + supply Pin 2: not used Pin 3: not used Pin 4: ÷ supply	Pin1: + supply Pin 2: ÷ supply Pin 3: not used
Electrical connection, 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V, 1 – 10 V output	Pin1: + supply Pin 2: ÷ supply/ common Pin 3: + output  Earth: Connected to MBS enclosure	Brown wire: + output Black wire: ÷ supply Red wire: + supply Orange: not used Screen: not connected to MBS enclosure	Pin1: + supply Pin 2: not used Pin 3: + output Pin 4: ÷ supply/ common	Pin1: + supply Pin 2: ÷ supply/ common Pin 3: + output
Electrical connection Ratiometric output, 10-90 % of supply voltage	Pin1: + supply Pin 2: ÷ supply Pin 3: output / common  Earth: Connected to MBS enclosure	Brown wire: output Black wire: ÷ common Red wire: + supply Orange: not used Screen: not connected to MBS enclosure	Pin1: + supply Pin 2: not used Pin 3: output Pin 4: ÷ supply/ common	Pin1: + supply Pin 2: ÷ supply Pin 3: output/common

⁽¹⁾ Female plug: Glass filled polyester, PBT

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

Note: Please check store.danfoss.com to find the correct variant for your requirements.

Electrical connections (*continuous*)

Type code	C8	D9	G1
	 ISO 15170-A1-3.2-Sn Bayonet	 AMP 173065, male Flying leads 125 mm	 AMP Econoseal J series (male)
Ambient temperature	-40 – 85 °C	-40 – 85 °C	-30 – 85 °C
Enclosure (IP protection fulfilled together with mating connector)	IP67/IP69	IP67	IP67
Atex Zone 2 enclosure	IP54		
Material	Glass filled polyester PBT ⁽²⁾	Glass filled polyester PBT ⁽²⁾	Glass filled polyamide, PA 6.6 ⁽¹⁾
Electrical connection, 4 – 20 mA output (2 wire)	-	Pin 1: + supply Pin 2: ÷ supply Pin 3: not used	Pin 1: + supply Pin 2: ÷ supply Pin 3: not used
Electrical connection, 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V, 1 – 10 V output	-	Pin 1: + supply Pin 2: ÷ supply Pin 3: + output	Pin 1: + supply Pin 2: ÷ supply/ common Pin 3: + output
Electrical connection Ratiometric output, 10-90 % of supply voltage	Pin 1: + supply Pin 2: ÷ supply/ common Pin 3: + output Pin 4: Not used	-	Pin 1: + supply Pin 2: ÷ supply/ common Pin 3: + output

⁽¹⁾ Female plug: Glass filled polyester, PBT⁽²⁾ Wire: PTFE (teflon) Protection sleeve: PBT mesh (polyester)⁽³⁾ Common**Note:** Please check store.danfoss.com to find the correct variant for your requirements.

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The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Issuer	Approval topic
Electrical Safety Certificate	UL E311982	UL - Underwriters Laboratories inc.	
Electrical Safety Certificate	UL E510763	UL - Underwriters Laboratories inc.	
Manufacturer's Declaration	Danfoss MD 060R3160.00	Danfoss	China RoHS
Pressure Safety Certificate	TSSA CRN.0F18477.5123467890YTN	TSSA - Technical Standards & Safety Authority	CRN
Explosive Safety Certificate	UL E227388	UL - Underwriters Laboratories inc.	UL-CSA
Electrical Safety Certificate	UL E494625	UL - Underwriters Laboratories inc.	
Electrical Safety Certificate	UL E31024	UL - Underwriters Laboratories inc.	
Hygienic Certificate	NSF C0252992	NSF International	Drinking Water
EU-UK Declaration	Danfoss EU-UK 064G9615.11	Danfoss	EMC
UA Declaration	Danfoss UA 2023-01-10 Regulators PL01 PL04	Danfoss	Pressure
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.05-22	LLC CDC EURO TYSK - Ukraine	Pressure
UA Declaration	Danfoss UA 2024-07-25 cooling sensors	Danfoss	LVD
EAC Declaration	EAC KZ 7100841.13.12.00005	EAC - Eurasian Customs Union	EMC
Hygienic Certificate	NSF C863837	NSF International	Drinking Water
Export Control Declaration	Pressure & Temperature Sensors	Danfoss	
EU Declaration	PL 04 Packaging	Danfoss	Packaging

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