

Data sheet

# Pressure transmitters for industrial applications

## MBS 33



The standard pressure transmitters MBS 33 are designed for use in almost all industrial applications, and offer reliable pressure measurements, 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.

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

- Designed for use in severe industrial environments
- CE-marked: EMC protected in accordance with EU EMC Directive
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- Fully digitally compensated
- Output signals:
  - 0 – 5 V, 1 – 5 V, 1 – 6 V or 0 – 10 V DC
  - 4 – 20 mA
- A wide range of pressure connections
- Electrical connection: plug or cable
- For use in ATEX Zone 2 explosive atmospheres

**Technical data**
**Performance (EN 60770)**

Accuracy (incl. non-linearity, hysteresis and repeatability)	$\leq \pm 0.3\%$ FS (typ.)
	$\leq \pm 0.8\%$ FS (max.)
Non-linearity BFSL (conformity)	$\leq \pm 0.2\%$ FS
Hysteresis and repeatability	$\leq \pm 0.1\%$ FS
Thermal zero point shift	$\leq \pm 0.1\%$ FS / 10K (typ.)
	$\leq \pm 0.2\%$ FS / 10K (max.)
Thermal sensitivity (span) shift	$\leq \pm 0.1\%$ FS / 10K (typ.)
	$\leq \pm 0.2\%$ FS / 10K (max.)
Response time	Liquids with viscosity < 100 cSt < 4 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 <sup>6</sup> cycles

**Electrical specifications**

Nom. output signal (short-circuit protected)	4 – 20 mA	0–5 V, 1–5 V, 1–6 V	0–10 V,
Supply voltage [U <sub>b</sub> ], polarity protected	9–32 V DC		15–32 V DC
Supply – current consumption	–	$\leq 5$ mA	$\leq 8$ mA
Supply voltage dependency	< 0.1% FS / 10 V	< 0.05% FS / 10 V	
Output limitation	22.4mA (typ.)	0-5 V: 5.75 V 1-5 V: 5.6 V 1-6 V: 6.75 V	0-10 V: 11.5 V
Sink / Source	–	< 1 mA	
Load [R <sub>L</sub> ] (load connected to 0 V)	$R_L \leq (U_b - 10 V) / 0.02 A$	$R_L \geq 10 k\Omega$	$R_L \geq 15 k\Omega$

**Environmental conditions**

Sensor operating temperature	Normal	-40 – 85 °C	
	ATEX Zone 2	-10 – 85 °C	
Media temperature range	-40 – 85 °C		
Ambient temperature range (depending on electrical connection)	See page 5		
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		
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 <sub>rms</sub> , 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 page 5		

**Technical data**  
*(continued)*
**Explosive atmospheres**

Zone 2 applications	<b>II 3G</b> <b>Ex nA IIA T3 Gc</b> <b>-10 °C &lt; Ta &lt; +85 °C</b>	EN60079-0; EN60079-15, En60079-7
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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 page 5
Net weight (depending on pressure connection and electrical connection)		0.2 – 0.3 kg

**Ordering standard**

**MBS 33**

**Measuring range**

0 – 1.0 bar	1 0
0 – 1.6 bar	1 2
0 – 2.5 bar	1 4
0 – 4.0 bar	1 6
0 – 6.0 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

**Gasket / O-ring material**

0	No gasket
2	Gasket, NBR -40 °C – 85 °C
4	O-ring, NBR -40 °C – 85 °C

**Pressure connection**

AB 0 4	G ¼ A (EN 837)
AB 0 8	G ½ A (EN 837)
AC 0 4	¼ – 18 NPT
BA 1 2	M18 × 1.5 (DIN 3852/3)
BA 1 6	M22 × 1.5 (DIN 3852-E)
GB 0 4	G ¼ (DIN 3852-E)

**Electrical connection**

A1	Plug Pg 9 (EN175301-803-A)
A3	Screened cable, 2 m

**Output signal**

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

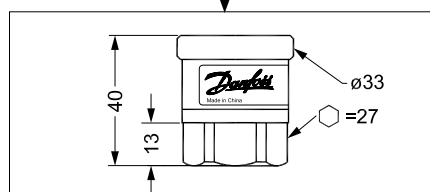
Preferred version

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	A1	A3
	EN175301-803-A, Pg 9	2 m screened cable



	G 1/4 A (EN 837)	M18 x 1.5 (DIN 3852/3)	G 1/2 A (EN 837)	1/4 -18 NPT	M22 x1.5 (DIN 3852-E)	G 1/4 (DIN 3852-E)
Type code	AB04	AB12	AB08	AC04	BA16	GB04
Recommended torque <sup>1)</sup>	30 – 35 Nm	30 – 35 Nm	30 – 35 Nm	2 – 3 turns after finger tightened	30 – 35 Nm	30 – 35 Nm

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

**Electrical connections**

Type code	A1	A3
	<p>EN 175301-803-A, Pg 9</p>	<p>2 m screened cable</p>
Ambient temperature	-40 – 85 °C	-30 – 85 °C
Enclosure (IP protection fulfilled together with mating connector)	IP65	IP67
Material	Glass filled polyamide, PA 6.6	Polyolefin cable with PE shrinkage tubing
Electrical connection, 4 – 20 mA output (2 wire)	Pin 1: + 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
Electrical connection, 0 – 5 V, 1 – 5 V, 1 – 6 V, 0 – 10 V output	Pin 1: + supply Pin 2: ÷ supply <sup>1)</sup> Pin 3: + output  Earth: Connected to MBS enclosure	Brown wire: + output Black wire: ÷ supply <sup>1)</sup> Red wire: + supply Orange: not used Screen: not connected to MBS enclosure

<sup>1)</sup> Common