Pressure transmitters for industrial applications

Type MBS 32 and MBS 33

Technical brochure

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)
- Temperature compensated, linearized and laser adjusted
- Output signals:
  - MBS 32: 0-5 V, 1-5 V, 1-6 V or 0-10 V d.c.
  - MBS 33: 4-20 mA
- Many different pressure connections
- Electrical connection through plug or cable

Description

The standard pressure transmitter MBS 32 and MBS 33 is designed for use in almost all industrial applications, 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

MBS 33 for absolute pressure measuring,
Output signal: 4-20 mA

Pressure connection	Measurering ranges P_{abs} [bar]	EN 175301-803-A plug version, Pg 9		Cable version (2 m)	
		Type no.	Code no.	Type no.	Code no.
G 1/2 A (EN 837)	0-1	MBS 33-1021-1AB08	**060G3036**	MBS 33-1021-3AB08	**060G3086**
	0-1.6	MBS 33-1221-1AB08	**060G3037**	MBS 33-1221-3AB08	**060G3087**
	0-2.5	MBS 33-1421-1AB08	**060G3038**	-	**-**
	0-4	MBS 33-1621-1AB08	**060G3039**	MBS 33-1621-3AB08	**060G3089**
	0-6	MBS 33-1821-1AB08	**060G3040**	MBS 33-1821-3AB08	**060G3090**
	0-10	MBS 33-2021-1AB08	**060G3041**	MBS 33-2021-3AB08	**060G3091**
	0-16	MBS 33-2221-1AB08	**060G3042**	MBS 33-2221-3AB08	**060G3092**
	0-25	MBS 33-2421-1AB08	**060G3043**	-	**-**

Ordering standard versions

MBS 33 for gauge (relative) pressure measuring
Output signal: 4-20 mA

Pressure connection	Measurering ranges P_e [bar]	EN 175301-803-A plug version, Pg 9		Cable version (2 m)	
		Type no.	Code no.	Type no.	Code no.
G 1/2 A (EN 837)	0-1	MBS 33-1011-1AB08	**060G3006**	MBS 33-1011-3AB08	**060G3056**
	0-1.6	MBS 33-1211-1AB08	**060G3007**	-	**-**
	0-2.5	MBS 33-1411-1AB08	**060G3008**	MBS 33-1411-3AB08	**060G3058**
	0-4	MBS 33-1611-1AB08	**060G3009**	MBS 33-1611-3AB08	**060G3059**
	0-6	MBS 33-1811-1AB08	**060G3010**	MBS 33-1811-3AB08	**060G3060**
	0-10	MBS 33-2011-1AB08	**060G3011**	MBS 33-2011-3AB08	**060G3061**
	0-16	MBS 33-2211-1AB08	**060G3012**	MBS 33-2211-3AB08	**060G3062**
	0-25	MBS 33-2411-1AB08	**060G3013**	MBS 33-2411-3AB08	**060G3063**
	0-40	MBS 33-2611-1AB08	**060G3014**	MBS 33-2611-3AB08	**060G3064**
	0-60	MBS 33-2811-1AB08	**060G3015**	MBS 33-2811-3AB08	**060G3065**
	0-100	MBS 33-3011-1AB08	**060G3016**	-	**-**
	0-160	MBS 33-3211-1AB08	**060G3017**	MBS 33-3211-3AB08	**060G3067**
	0-250	MBS 33-3411-1AB08	**060G3018**	MBS 33-3411-3AB08	**060G3068**
	0-400	MBS 33-3611-1AB08	**060G3019**	MBS 33-3611-3AB08	**060G3069**
	0-600	MBS 33-3811-1AB08	**060G3020**	-	**-**

MBS 32 for absolute pressure measuring
Output signal: 0-10 V

Pressure connection	Measuring ranges P_{abs} [bar]	EN 175301-803-A plug version, Pg 9	
		Type no.	Code no.
G 1/2 A (EN 837)	0-1	MBS 32-1025-1AB08	**060G1264**
	0-1.6	MBS 32-1225-1AB08	**060G3050**
	0-2.5	MBS 32-1425-1AB08	**060G1266**
	0-4	MBS 32-1625-1AB08	**060G1267**
	0-6	MBS 32-1825-1AB08	**060G1268**
	0-10	MBS 32-2025-1AB08	**060G1269**
	0-16	MBS 32-2225-1AB08	**060G1270**
	0-25	MBS 32-2425-1AB08	**060G1271**

MBS 32 for gauge (relative) pressure measuring
Output signal: 1-6 V or 0-10 V
EN 175301-803-A plug, Pg 9

Pressure connection	Measuring ranges P_e[bar]	1-6 V dc output signal		0-10 V dc output signal	
		Type no.	Code no.	Type no.	Code no.
G 1/2 A (EN 837)	0-1	-	**-**	MBS 32-1015-1AB08	**060G1222**
	0-1.6	-	**-**	MBS 32-1215-1AB08	**060G1223**
	0-2.5	-	**-**	MBS 32-1415-1AB08	**060G1224**
	0-4	MBS 32-1614-1AB08	**060G3285**	MBS 32-1615-1AB08	**060G1225**
	0-6	-	**-**	MBS 32-1815-1AB08	**060G1226**
	0-10	MBS 32-2014-1AB08	**060G3079**	MBS 32-2015-1AB08	**060G2085**
	0-16	MBS 32-2214-1AB08	**060G1286**	MBS 32-2215-1AB08	**060G1228**
	0-25	MBS 32-2414-1AB08	**060G1287**	MBS 32-2415-1AB08	**060G1229**
	0-40	MBS 32-2614-1AB08	**060G1288**	MBS 32-2615-1AB08	**060G1239**
	0-60	-	**-**	MBS 32-2815-1AB08	**060G1249**
	0-100	MBS 32-3014-1AB08	**060G1290**	-	**-**
	0-160	-	**-**	MBS 32-3215-1AB08	**060G1260**
	0-250	-	**-**	MBS 32-3415-1AB08	**060G1261**
	0-400	-	**-**	MBS 32-3615-1AB08	**060G1262**
	0-600	MBS 32-3814-1AB08	**060G1294**	MBS 32-3815-1AB08	**060G1263**

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		>10×10⁶ 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)	$R_L \leq (U_B\text{-}10V)/0.02A$	$R_L \geq 10$ kΩ	$R_L \geq 15$ kΩ

Environmental conditions

Medium 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	
	Random	7.5 g_{rms}, 5Hz-1kHz	IEC 60068-2-64
Shock resistance	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

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 32 -
MBS 33 - [ ] - [ ] [ ] [ ] [ ] [ ]

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

Output signal

1	4-20 mA [1]
2	0-5 V [2]
3	1-5 V [2]
4	1-6 V [2]
5	0-10 V [2]

Electrical connection

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

1	Plug Pg 9 (EN175301-803-A)
3	Screened cable, 2 m

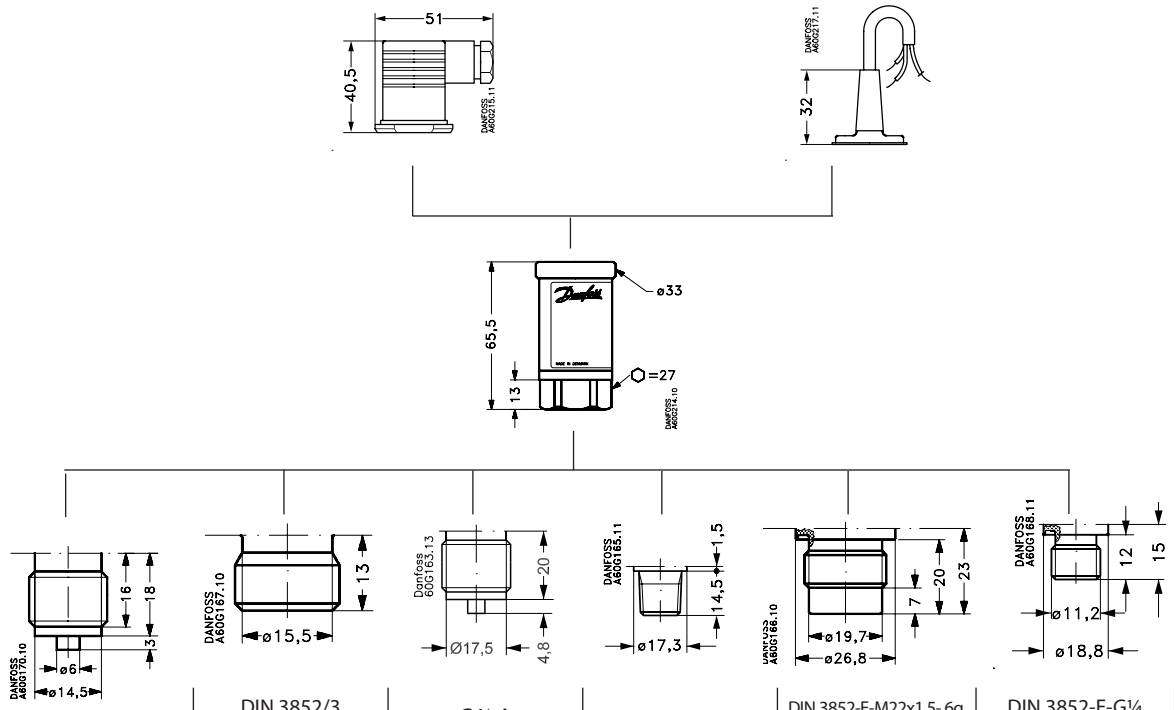
Pressure connection

A B 0 4	G ¼ A (EN 837)
A B 0 8	G ½ A (EN 837)
A C 0 4	¼ - 18 NPT
B A 1 2	DIN 3852/3; M18 x 1.5-6g NBR O-ring
B A 1 6	DIN 3852-E-M22 x 1.5 NBR gasket
G B 0 4	DIN 3852-E-G¼ gasket DIN 3869-14

[1] MBS 33 only [2] MBS 32 only

Dimensions/combinations

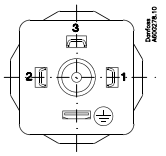
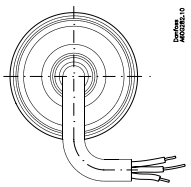
Type code	1	3
	EN175301-803-A, Pg9	2 m screened cable



	G ¼ A (EN 837)	DIN 3852/3 M18x1.5- 6g NBR, O-ring	G ½ A (EN 837)	¼-18 NPT	DIN 3852-E-M22x1.5- 6g Gasket: DIN 3869-14 NBR, O-ring	DIN 3852-E-G¼ Gasket: DIN 3869-14 NBR, O-ring
Type code	AB04	BA12	AB08	AC04	BA16	GB04
Recommended torque 1)	30-35 Nm	30-35 Nm	30-35 Nm	2-3 turns after finger tightened	30-35 Nm	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
EN 175301-803-A, Pg9 	2 m screened cable 
Ambient temperature	
-40 to +85 °C	-30 to +85 °C
Enclosure *(IP protection fulfilled together with mating connector)*	
IP 65	IP 67
Materials	
Glass filled polyamid, PA 6.6	Poliolyfin cable with PE shirnkage 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, 0-5V, 1-5V, 1-6V, 0-10V output	
Pin 1: +supply Pin 2: ÷supply 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