pressure transmitter
series PT11

for further approvals
see page 5

MicroTronic®

Applications

- Machine building
- Hydraulics and pneumatics
- General industrial applications

Special features

- Measuring ranges from 0 ... 6 to 0 ... 1,000 bar
- Current and voltage outputs
- Ingress protection IP65 or IP67
- Wetted parts and case from stainless steel
- Vacuum-tight

Fig. left: Model M-10 with angular connector
Fig. centre: Model M-11 with circular connector M12 x 1
Fig. right: Model M-10 with cable outlet

Description

Slimline
The model M-10 or M-11 pressure sensor is one of the thinnest and smallest industrial pressure sensors on the market. It therefore offers the ideal solution for applications where mounting space is limited.

Robust
Despite their slimline and compact design, the models M-10 and M-11 are designed for high pressure ranges up to 1,000 bar.
The thin-film measuring cell, through the optimised design of its process connection, guarantees a high measurement performance, even with dynamic loads and extreme pressure spikes.

Precise
The models M-10 and M-11 offer an accuracy of 0.5 %. In combination with an exceptional long-term stability, reliable acquisition of the measured values is ensured.

Flush
The model M-11 pressure sensor features a flush process connection, which sets it apart from other miniaturised pressure sensors.
This process connection is especially suited to measurement in highly viscous, contaminated or crystallising media.

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Measuring ranges

Gauge pressure						
bar	**Measuring range**	**0 ... 6** [1]	**0 ... 10** [1]	**0 ... 16** [1]	**0 ... 25**	**0 ... 40**
	Overpressure safety	20	20	32	50	80
	Measuring range	**0 ... 60**	**0 ... 100**			
	Overpressure safety	120	200			
	Measuring range	**0 ... 160**	**0 ... 250**	**0 ... 400**	**0 ... 600**	**0 ... 1,000** [1]
	Overpressure safety	320	500	800	1,200	1,500
psi	**Measuring range**	**0 ... 500**	**0 ... 1,000**	**0 ... 3,000**	**0 ... 5,000**	**0 ... 10,000** [1]
	Overpressure safety	1,000	2,000	6,000	10,000	20,000
	Measuring range	**0 ... 15,000** [1]				
	Overpressure safety	20,000				

1) Only for model M-10

Other measuring ranges on request

Vacuum tightness
Yes

Output signal

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	DC 1 ... 5 V
	DC 0.1 ... 10 V

Other output signals on request

Load in Ω
4 ... 20 mA: ≤ (power supply - 10 V) / 0.02 A
DC 1 ... 5 V: > 10k
DC 0.1 ... 10 V: > 20k

Voltage supply

Power supply
The power supply depends on the selected output signal
4 ... 20 mA: DC 10 ... 35 V
DC 1 ... 5 V: DC 8 ... 35 V
DC 0.1 ... 10 V: DC 14 ... 35 V

Models M-10 and M-11 can be used with up to DC 36 V. The CSA approval is valid up to a maximum of DC 35 V.

Total current consumption
Current output (2-wire): Signal current, max. 25 mA
Voltage output (3-wire): 8 mA

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Reference conditions (per IEC 61298-1)

Temperature
15 ... 25 °C (59 … 77 °F)

Atmospheric pressure
860 ... 1,060 mbar (12.5 ... 15.4 psi)

Humidity
45 ... 75 % r. h.

Power supply
DC 24 V

Nominal position
Calibrated in vertical mounting position with process connection facing downwards.

Accuracy specifications

Accuracy at room temperature
≤ ±0.5 % of span

Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2).

Non-linearity (per IEC 61298-2)
≤ ±0.2 % of span BFSL

Non-repeatability
≤ 0.1 % of span

Temperature error at -20 ... +80 °C (-4 ... +176 °F)

- Mean temperature coefficient of zero point
  ≤ ±0.2 % of span/10 K

  The following applies for model M-11 with measuring range 0 ... 25 bar:
  ≤ ±0.3 % of span/10 K

- Mean temperature coefficient of span
  ≤ ±0.2 % of span/10 K

Long-term stability
≤ ±0.2 % of span/year

Time response

Settling time
≤ 4 ms

Switch-on time
≤ 15 ms

Operating conditions

Ingress protection (per IEC 60529)
For ingress protection see “Electrical connections”
The ingress protection stated therein only applies when plugged in using mating connectors that have the appropriate ingress protection.

Vibration resistance (per IEC 60068-2-6)
20 g (under resonance)

Shock resistance (per IEC 60068-2-27)
800 g (mechanical shock)

Service life
10 million load cycles

Permissible temperatures
Medium: -40 ... +100 °C (-40 ... +212 °F)
Ambient: -40 ... +100 °C (-40 ... +212 °F) [1)]
Storage: -40 ... +100 °C (-40 ... +212 °F) [1)]

1) Instruments with cable outlet are only suitable for an ambient and storage temperature of -40 ... +80 °C (-40 ... +176 °F).

Process connections

Model M-10

Standard	Thread size
EN 837	G ¼ B
DIN EN ISO 1179-2 (formerly DIN 3852-E)	G ¼ A [1)]
ANSI/ASME B1.20.1	¼ NPT

1) Maximum overpressure safety 600 bar (8,000 psi)

Model M-11

Standard	Thread size
-	G ¼ B flush [1)]

1) Flush process connections only possible for measuring ranges from 0 ... 25 to 0 ... 600 bar (0 ... 500 to 0 ... 5,000 psi).

Sealings
G ¼ A: FPM/FKM
G ¼ B: without sealing
¼ NPT: without sealing
G ¼ B flush: NBR [1)]

1) Minimum permissible medium and ambient temperature -30 °C (-22 °F)

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Electrical connections

Designation	Ingress protection	Wire cross-section	Cable diameter	Cable material
Circular connector M12 x 1 (4-pin)	Measuring range < 100 bar (3,000 psi): IP65 [1] Measuring range ≥ 100 bar (3,000 psi): IP67	-	-	-
Angular connector DIN EN 175301-803 C	IP65 [2]	-	1.5 ... 6.0 mm	-
Cable outlet, 1.5 m (4.92 ft) [3] [4]	Measuring range < 100 bar (3,000 psi): IP65 [1] Measuring range ≥ 100 bar (3,000 psi): IP67	3 x 0.14 mm² [5]	4.5 ... 5.0 mm	PUR

1) IP67 on request
2) For conductor cross-section to max. 0.75 mm²
3) Permissible ambient temperature -40 ... + 80 °C (-40 ... +176 °F)
4) Other cable lengths on request
5) For wire cross-section to max. 0.3 mm², approx. AWG 22 with end splices

The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

Short-circuit resistance
S+ vs. 0V

Reverse polarity protection
U_B vs. 0V

Insulation voltage
DC 500 V

Connection diagrams

Circular connector M12 x 1 (4-pin)

	2-wire	3-wire
U_B	1	1
0V	3	3
S+	-	4

Angular connector DIN 175301-803 C

	2-wire	3-wire
U_B	1	1
0V	2	2
S+	-	3

Cable outlet, 2 m

	2-wire	3-wire
U_B	brown	brown
0V	green	green
S+	-	white

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Materials

Wetted parts
316Ti, PH grade steel
For sealing materials see “Process connections”

Non-wetted parts
Case: 316Ti
Electrical connections:
- Circular connector M12 x 1: Nickel-plated brass
- Angular connector DIN EN 175301-803 C: 303, PA, PBT
- Cable outlet: PA

Internal system fill fluid (model M-11 only)
Synthetic oil

Approvals

Logo	Description	Country
CE	**EU declaration of conformity** ■ EMC directive EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ Pressure equipment directive ■ RoHS directive	European Union
c SP us	**CSA** Safety (e.g. electr. safety, overpressure, ...)	USA and Canada
EAC	**EAC** EMC directive	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus
	Uzstandard Metrology, measurement technology	Uzbekistan
-	**CRN** Safety (e.g. electr. safety, overpressure, ...)	Canada

Manufacturer's information and certifications

Logo	Description
-	**MTTF: > 100 years**
-	**China RoHS directive**

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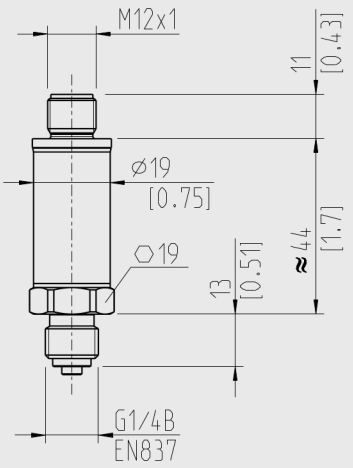
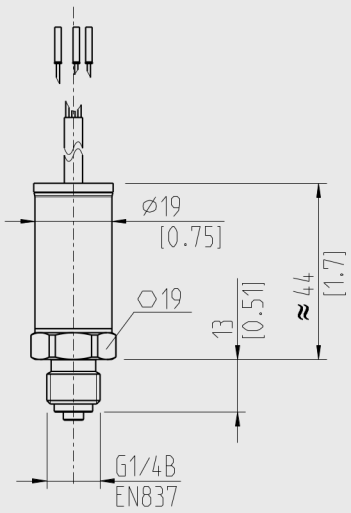
Dimensions in mm [in]

Pressure sensor

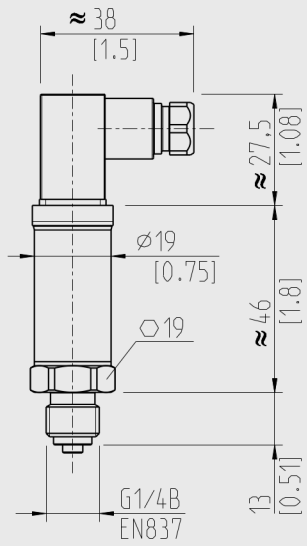
with circular connector M12 x 1



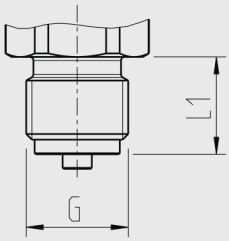
with cable outlet, cable length 2 m



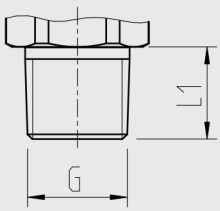
with angular connector DIN EN 175301-803 C



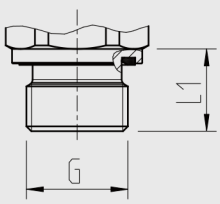
Process connections for model M-10



G	L1
G ¼ B EN 837	13 [0.51]

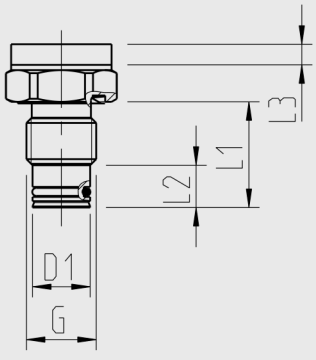


G	L1
¼ NPT	13 [0.51]



G	L1
G ¼ A DIN EN ISO 1179-2 (formerly DIN 3852-E)	14 [0.55]

Process connection for model M-11



G	L1	L2	L3	D1
G ¼ B	20 [0.79]	8 [0.31]	3.9 [0.15]	10.9 [0.43]

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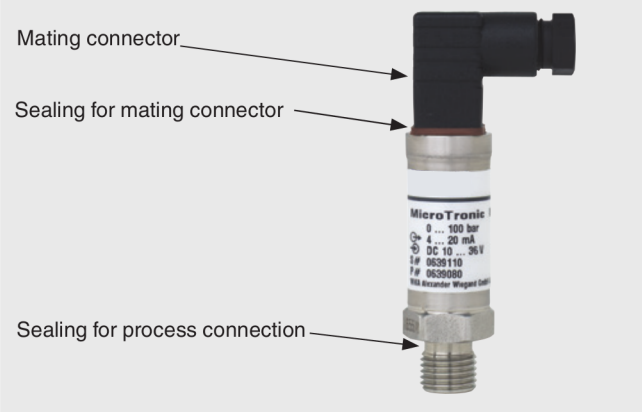
Accessories and spare parts



Mating connector

Designation	Order number		
	without cable	with 2 m cable	with 5 m cable
Angular connector DIN 175301-803 C	1439081	11225823 [2]	11250194 [2]
Circular connector M12 x 1, 4-pin			
■ straight	2421262 [1]	11250780 [3]	11250259 [3]
■ angled	2421270 [1]	11250798 [3]	11250232 [3]

1) Max. medium temperature -40 ... +85 °C (-40 ... +185 °F)
2) Max. medium temperature -40 ... +90 °C (-40 ... +194 °F)
3) Max. medium temperature -25 ... +80 °C (-13 ... +176 °F)

Sealings for mating connectors

Designation	Order number
Angular connector DIN 175301-803 C	11437881

Sealings for process connection

Designation	Order number
G ¼ B flush, O-ring	0477940
G ¼ B flush, form seal	1537857 [1]
G ¼ A DIN EN ISO 1179-2 (formerly DIN 3852-E)	14045531

1) -30 ... +100 °C (-22 ... +212 °F)

Accessories are not part of the approval.

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