

OEM pressure sensor For mobile working machines Model MH-3

WIKA Data sheet PE 81.59



Applications

- Load monitoring
- Load moment limitation
- Hydraulic drive control

Special features

- For extreme operating conditions
- Compact and robust design
- Diagnostic function (option)
- Signal clamping (option)
- Customer-specific modifications possible



Pressure sensor model MH-3

Description

Durable and robust

Shock and vibration resistance, resistance to pressure spikes (CDS system) and an ingress protection of up to IP69K make the model MH-3 pressure sensor especially qualified for the harsh operating conditions of mobile working machines. Even extreme temperature shocks do not affect its performance.

The case is made of a highly resistant glass-fibre reinforced plastic (PBT). This material is successfully used within the automotive industry.

A metallic shield inside the instrument provides excellent EMC characteristics in accordance with EN 61326, thus ensuring reliable operation, even under high exposures of up to 100 V/m.

The hermetically-welded thin-film measuring cell ensures long-term leak-tightness, without the need for additional sealing materials.

Especially in applications with high dynamic load cycles, the thin-film measuring cell features high long-term stability and load-cycling resistance.

State-of-the-art manufacturing

Our manufacturing concept is optimally designed for the production of OEM needs. Also customer-specific modifications of the instruments are possible.

Diagnostic function

As a measuring instrument of the latest generation, the MH-3 features a diagnostic function. By means of the output signal, fault conditions can be detected and evaluated via software. Thus it is possible to differentiate between permanent and temporary faults.

Measuring ranges

Gauge pressure				
bar	0 ... 6	0 ... 10	0 ... 16	0 ... 25
	0 ... 40	0 ... 60	0 ... 100	0 ... 160
	0 ... 250	0 ... 400	0 ... 600	
psi	0 ... 100	0 ... 160	0 ... 200	0 ... 300
	0 ... 500	0 ... 1,000	0 ... 1,500	0 ... 2,000
	0 ... 3,000	0 ... 5,000	0 ... 8,000	

Overload safety

2 times

Vacuum tightness

Yes

Reference conditions (per IEC 61298-1)

Temperature

15 ... 25 °C

Atmospheric pressure

860 ... 1,060 mbar

Humidity

45 ... 75 % r. h.

Power supply

DC 24 V

Mounting position

Calibrated in vertical mounting position with pressure connection facing downwards.

Output signals

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	DC 0 ... 10 V
	DC 1 ... 5 V
	DC 1 ... 6 V
Ratiometric	DC 0.5 ... 4.5 V

Other output signals available on request

Load

- 4 ... 20 mA: $\leq (\text{power supply} - 10 \text{ V}) / 0.02 \text{ A}$
- DC 0 ... 10 V: $> 5 \text{ k}\Omega$
- DC 1 ... 5 V: $> 2.5 \text{ k}\Omega$
- DC 1 ... 6 V: $> 5 \text{ k}\Omega$
- DC 0.5 ... 4.5 V: $> 4.5 \text{ k}\Omega$

Voltage supply

Power supply

The power supply depends on the selected output signal.

- 4 ... 20 mA: DC 10 ... 36 V
- DC 0 ... 10 V: DC 14 ... 36 V
- DC 1 ... 5 V: DC 8 ... 36 V
- DC 1 ... 6 V: DC 9 ... 36 V
- DC 0.5 ... 4.5 V: DC 4.5 ... 5.5 V

Current consumption

The current consumption depends on the selected output signal.

- 4 ... 20 mA: $< 30 \text{ mA}$
- DC 0 ... 10 V: $< 10 \text{ mA}$
- DC 1 ... 5 V: $< 10 \text{ mA}$
- DC 1 ... 6 V: $< 10 \text{ mA}$
- DC 0.5 ... 4.5 V: $< 10 \text{ mA}$

Accuracy data

Accuracy at reference conditions

$\leq \pm 1\%$ of span for measuring ranges ≥ 40 bar
 $\leq \pm 2\%$ of span for measuring ranges < 40 bar

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

Non-linearity (per IEC 61298-2)

$\leq \pm 0.25\%$ of span for measuring ranges ≥ 40 bar
 $\leq \pm 0.40\%$ of span for measuring ranges < 40 bar

Temperature error at $-40 \dots +100\text{ }^{\circ}\text{C}$

Mean temperature coefficient of zero point:

$\leq \pm 0.15\%$ of span/10 K for measuring ranges ≥ 40 bar
For measuring ranges < 40 bar: on request

Mean temperature coefficient of span:

$\leq \pm 0.08\%$ of span/10K

Settling time

≤ 2 ms

Long-term stability

$\leq \pm 0.2\%$ of span/year for measuring ranges ≥ 40 bar
 $\leq \pm 0.3\%$ of span/year for measuring ranges < 40 bar

Operating conditions

Ingress protection (per IEC 60529)

The ingress protection depends on the type of electrical connection.

- Circular connector M12 x 1 (4-pin): IP67
- Metri-Pack series 150 (3-pin): IP67
- AMP Superseal 1.5 (3-pin): IP67
- Deutsch DT04-3P (3-pin): IP67
- Cable outlet: IP69K

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

Vibration resistance

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

Shock resistance

500 g (per IEC 60068-2-27, mechanical)

Permissible temperature ranges

- Ambient: $-40 \dots +100\text{ }^{\circ}\text{C}$
- Medium: $-40 \dots +125\text{ }^{\circ}\text{C}$
- Storage: $-40 \dots +100\text{ }^{\circ}\text{C}$

Electrical connections

Short-circuit resistance

S₊ vs. U₋

Reverse polarity protection

U₊ vs. U₋

(no reverse polarity protection with ratiometric output signal)

Insulation voltage

DC 500 V

Connection diagrams

Circular connector M12 x 1 (4-pin)			
		2-wire	3-wire
	U ₊	1	1
	U ₋	3	3
	S ₊	-	4

AMP Superseal 1.5 (3-pin)			
		2-wire	3-wire
	U ₊	3	3
	U ₋	1	1
	S ₊	-	2

Metri-Pack series 150 (3-pin)			
		2-wire	3-wire
	U ₊	B	B
	U ₋	A	A
	S ₊	-	C

Deutsch DT04-3P (3-pin)			
		2-wire	3-wire
	U ₊	A	A
	U ₋	B	B
	S ₊	-	C

Cable outlet			
		2-wire	3-wire
	U ₊	brown	brown
	U ₋	green	green
	S ₊	-	white
Wire cross-section 0.75 mm ² (with end splices) Cable diameter 6.6 mm Cable length 0.5 m, 2 m or 5 m			

Legend

U₊ Positive power supply terminal
U₋ Negative power supply terminal
S₊ Analogue output

Process connections

Process connection per	Thread size
EN 837	G ¼ B
DIN 3852-E	G ¼ A
	M14 x 1.5
ANSI/ASME B1.20.1	¼ NPT
ISO 6149-2	M14 x 1.5
SAE J514 Fig.34B	7/16-20 UNF-2A

Sealings and temperature ranges

Thread size	Standard FKM/FPM	Option 1 NBR
G ¼ A DIN 3852-E	-40 ... +125 °C	-30 ... +100 °C
M14 x 1.5 ISO 6149-2	-20 ... +125 °C	-30 ... +120 °C
7/16-20 UNF-2A (O-ring BOSS)	-20 ... +125 °C	-40 ... +100 °C

The sealings listed under "Standard" are included in the delivery.

CDS system

All process connections are available with the CDS system. The diameter of the pressure channel is reduced in order to counteract pressure spikes and cavitation (see fig.1).

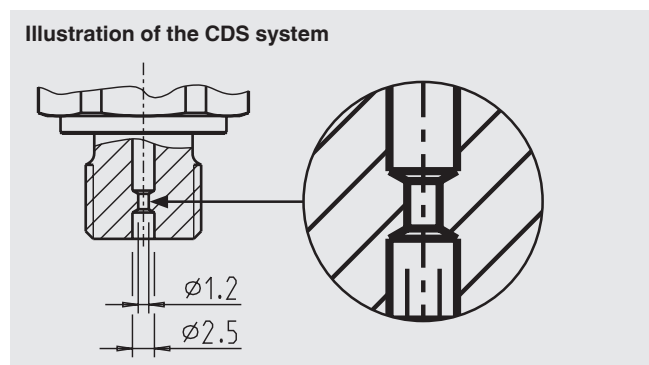


Fig. 1: Reduced diameter of the pressure channel

Materials

Wetted parts

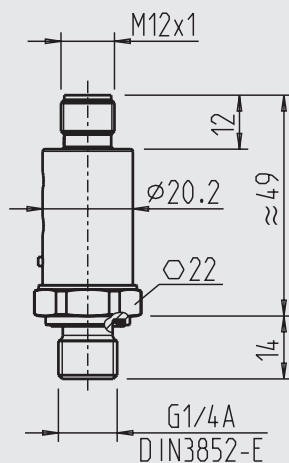
Stainless steel

Non-wetted parts

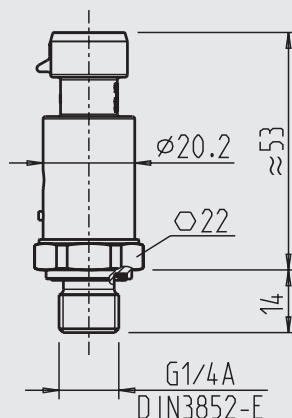
Highly resistant glass-fibre reinforced plastic (PBT)

Dimensions in mm

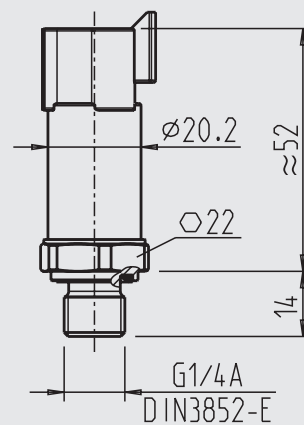
with circular connector M12 x 1



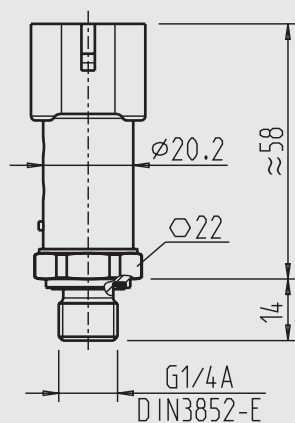
with Metri-Pack series 150



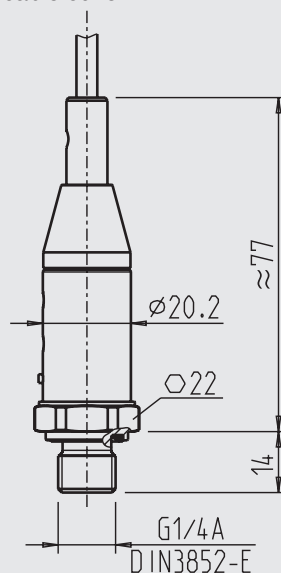
with Deutsch DT04-3P



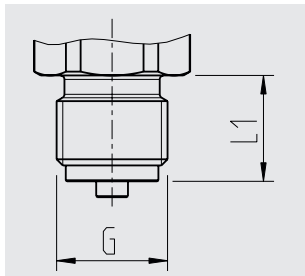
with AMP Superseal 1.5



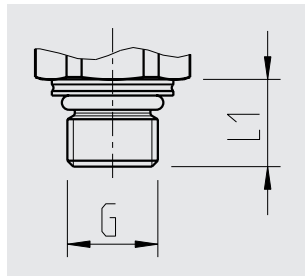
with cable outlet



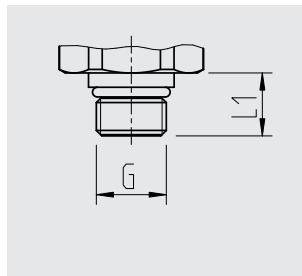
Process connections



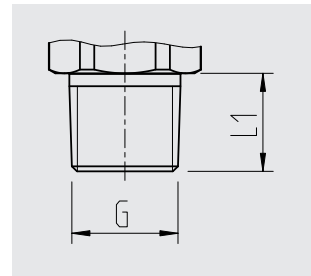
G	L1
G 1/4 B EN 837	13



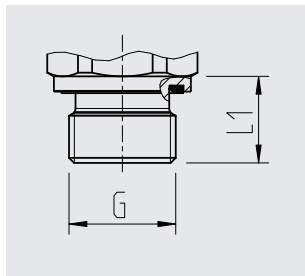
G	L1
M14 x 1.5 ISO 6149-2	13.5



G	L1
7/16-20 UNF	12






G	L1
1/4 NPT	13



G	L1
G 1/4 A DIN 3852-E	14
M14 x 1.5 DIN 3852-E	14

For information on tapped holes and welding sockets, see Technical information IN 00.14 at www.wika.com.

Approvals

Logo	Description	Country
	EU declaration of conformity <ul style="list-style-type: none"> ■ EMC directive EN 61326 emission (group 1, class B) and immunity (industrial application) ■ Pressure equipment directive 	European union
	EAC <ul style="list-style-type: none"> ■ EMC directive 	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
-	MTSCHS Permission for commissioning	Kazakhstan

Manufacturer's information and certifications

Logo	Description
	MTTF: > 100 years

Approvals and certificates, see website

Ordering information

Model / Measuring range / Output signal / Process connection / Sealing / Electrical connection

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