

Pressure sensor

For highest-pressure applications to 15,000 bar [217,500 psi]

Model HP-2

WIKA data sheet PE 81.53



for further approvals,
see page 6



Applications

- Test bench construction
- Water-jet cutting
- High-pressure pasteurisation
- High-pressure cleaning

Special features

- High number of load cycles through patented design
- Exchangeable process connection in case of hairline cracks
- Suitable for highly dynamic pressure due to diaphragm protection system
- Reduced recalibration costs thanks to excellent long-term stability



Pressure sensor model HP-2

Description

For highest pressures

The model HP-2 pressure sensor has been specifically developed for demanding high-pressure applications up to 15,000 bar [217,500 psi]. This makes it one of the few pressure measuring instruments in the world that can reliably measure pressures of this magnitude.

High accuracy

This pressure sensor features a very high long-term stability and offers extremely high accuracy for the highest pressures. Measuring ranges up to and including 0 ... 10,000 bar [145,000 psi] can, as an option, be supplied with an even higher accuracy of 0.25 %.

Long service life

Thanks to its excellent load cycle stability, the model HP-2 has a particularly long service life, even with dynamic pressure profiles.

A protection against cavitation and pressure spikes, specifically developed for highly dynamic pressure profiles, further extends the service life. For water as a medium, this protection is particularly recommended.

Specifications

Overview of versions	
Model HP-2-S	Standard version
Model HP-2-D	Additionally with DIPS (diaphragm impact protection system) DIPS protects the pressure sensor from cavitation and micro-diesel effects; it is particularly recommended for use with water as a medium.
Model HP-2-E	Additionally with EPC (exchangeable pressure connection) EPC enables the changing of the process connection without having to change the entire pressure sensor. This system is particularly recommended when hairline cracks can occur.

Further details on DIPS and EPC on request.

Accuracy specifications		
Accuracy	→ See "Max. measured error per IEC 61298-2"	
Max. measured error per IEC 61298-2	Measuring ranges < 10,000 bar [145,000 psi]	■ ≤ ±0.5 % of span ■ ≤ ±0.25 % of span
	Measuring range 10,000 bar [145,000 psi]	■ ≤ ±0.5 % of span ■ ≤ ±0.25 % of span, typical
	Measuring ranges 12,000 bar and 15,000 bar [217,500 psi]	≤ ±0.5 % of span, typical
Adjustability of current and voltage output	Zero point	±5 % of span
	Adjustment is made using potentiometers inside the instrument	
Adjustability of USB output	Zero point	-5 ... +20 % of span
	Span	-50 ... +5 % of span
	Adjustment is made via "EasyCom 2011" software	
Temperature error at 0 ... 80 °C [32 ... 176 °F]		
Typical	≤ ±1 % of span	
	≤ ±2 % of span for special measuring ranges	
Maximum	≤ ±2.5 % of span	
Long-term stability per DIN 16086	≤ 0.1 % of span/year	
	≤ 0.2 % of span/year for special measuring ranges	
Reference conditions	Per IEC 61298-1	

Measuring ranges

Gauge pressure						
bar	Measuring range	0 ... 1,600	0 ... 2,500¹⁾	0 ... 4,000¹⁾	0 ... 5,000¹⁾	0 ... 6,000
	Overload safety	2,300	3,500	5,000	6,000	7,000
	Burst pressure	4,000	6,000	8,000	10,000	11,000
	Measuring range	0 ... 7,000	0 ... 8,000	0 ... 10,000¹⁾	0 ... 12,000	0 ... 15,000²⁾
	Overload safety	8,000	10,000	11,000	12,500	15,500
	Burst pressure	11,000	12,000	12,000	14,000	16,000
psi	Measuring range	0 ... 23,000	0 ... 36,000¹⁾	0 ... 58,000¹⁾	0 ... 72,000¹⁾	0 ... 87,000
	Overload safety	33,300	50,500	72,500	87,000	101,500
	Burst pressure	58,000	87,000	116,000	145,000	159,500
	Measuring range	0 ... 100,000	0 ... 115,000	0 ... 145,000¹⁾	0 ... 217,500^{1) 2)}	
	Overload safety	116,000	145,000	159,000	224,750	
	Burst pressure	159,500	174,000	174,000	232,000	

1) Optionally also with a measuring cell from Elgiloy®

2) Adjustment at max. 12,500 bar [181,250 psi], 15,000 bar [217,500 psi] is calculated.

Further details on: Measuring range	
Units	bar, psi, MPa
Special measuring ranges	On request, special measuring ranges between the listed ranges 0 ... 1,600 and 0 ... 10,000 bar are possible. These special measuring ranges, however, have a higher temperature error and a reduced long-term stability.

Process connection				
Standard	Process connection	Max. measuring range	Overpressure limit	Type of sealing
-	M16 x 1.5 female thread, with sealing cone	7,000 bar [100,000 psi]	8,000 bar [115,000 psi]	60° sealing cone
-	M20 x 1.5 female thread, with sealing cone	15,000 bar [217,500 psi]	16,000 bar [224,750 psi]	60° sealing cone
-	9/16-18 UNF, female thread	7,000 bar [100,000 psi]	8,000 bar [115,000 psi]	60° sealing cone

The maximum permissible pressure at the installation point is dependent on the high-pressure pipes used. For the valid values, see the high-pressure pipe manufacturer's documentation.

Other process connections on request.

Output signal		
Signal type		
Analogue	Current (2-wire)	4 ... 20 mA
	Voltage (3-wire)	<ul style="list-style-type: none"> ■ DC 0 ... 5 V ■ DC 0 ... 10 V
Digital	USB 2.0	
Load in Ω		
Current (2-wire)	$\leq (\text{supply voltage} - 10 \text{ V})/0.02 \text{ A}$	
Voltage (3-wire)	$> \text{max. output signal}/1 \text{ mA}$	
Voltage supply		
Supply voltage	Output signal 4 ... 20 mA	DC 10 ... 30 V
	Output signal DC 0 ... 5 V	DC 10 ... 30 V
	Output signal DC 0 ... 10 V	DC 14 ... 30 V
	Output signal USB 2.0	DC 5 V
Current supply	Current (2-wire)	Signal current, max. 35 mA
	Voltage (3-wire)	8 mA
	USB 2.0	40 mA
Overvoltage resistance	<ul style="list-style-type: none"> ■ DC 36 V ■ DC 5.25 V with USB output 	
Dynamic behaviour		
Settling time per IEC 61298-2	Current and voltage output	$< 1 \text{ ms}$
	USB output	$< 10 \text{ ms}^1$
Warm-up time	$< 10 \text{ min}$	

1) Other values on request


Other output signals on request.

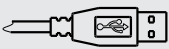
Electrical connection				
Connection type	IP code ¹⁾	Wire cross-section	Cable diameter	Cable lengths
Angular connector DIN 175301-803 A	IP65	Max. 1.5 mm ²	6 ... 8 mm [0.24 ... 0.32 in]	-
Circular connector M12 x 1 (4-pin)	IP67	-	-	-
USB connector type A	IP67 (instrument), IP20 (connector)	-	-	2 m [6.5 ft]
Cable outlet	IP67	0.5 mm ² (AWG 20)	6.8 mm [0.27 in]	1.5 m [16.4 ft]


1) The stated IP codes only apply when plugged in using mating connectors that have the appropriate IP code.


Further details on: Electrical connection	
Connection type	→ See above
Wire cross-section	→ See above
Cable diameter	→ See above
Pin assignment	→ See below
Ingress protection (IP code) per IEC 60529	→ See above
Short-circuit resistance	S+ vs. 0V
Reverse polarity protection	UB vs. 0V
Insulation voltage	DC 500 V

Pin assignment

Angular connector DIN 175301-803 A			
		2-wire	3-wire
	UB	1	1
	0V	2	2
	S+	-	3

USB connector type A		
	+5V	1
	GND	4
	D+	3
	D-	2

Circular connector M12 x 1 (4-pin)			
		2-wire	3-wire
	UB	1	1
	0V	3	3
	S+	-	4

Cable outlet			
		2-wire	3-wire
	UB	Brown	Brown
	0V	Green	Green
	S+	-	White

Legend

UB, +5V	Positive supply voltage
0V, GND	Reference potential
S+	Positive output terminal
D+, D-	Data link USB 2.0

Material	
Material (wetted)	
Process connection	Stainless steel 1.4534
Sensor	<ul style="list-style-type: none"> ■ Stainless steel 1.4534 ■ 2.4711 Elgiloy®



For hydrogen as a medium, see “Options for specific media”.

Operating conditions	
Medium temperature limit	0 ... +80 °C [32 ... 176 °F]
Ambient temperature limit	-20 ... +80 °C [-4 ... +176 °F]
Storage temperature limit	-40 ... +85 °C [-40 ... +185 °F]
Vibration resistance per IEC 60068-2-6	0.35 mm (10 ... 55 Hz)
Shock resistance per IEC 60068-2-27	100 g (2.4 ms)
Ingress protection (IP code) per IEC 60529	→ See "Electrical connection"
Service life	On request, since the service life depends on the actual pressure profile.

Options for specific media		
Hydrogen		
Measuring ranges	2,500, 4,000, 5,000 and 10,000 bar.	
Long-term drift	On request	
Material	Process connection	MP35N
	Sensor	2.4711 Elgiloy

Packaging and instrument labelling	
Packaging	Individual packaging
Instrument labelling	<ul style="list-style-type: none"> ■ WIKA product label, lasered ■ Customer-specific product label on request

Approvals

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC directive	
	Pressure equipment directive	
	RoHS directive	
	EAC EMC directive	Eurasian Economic Community
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

Manufacturer's information and certificates

Logo	Description
-	China RoHS directive

Test report

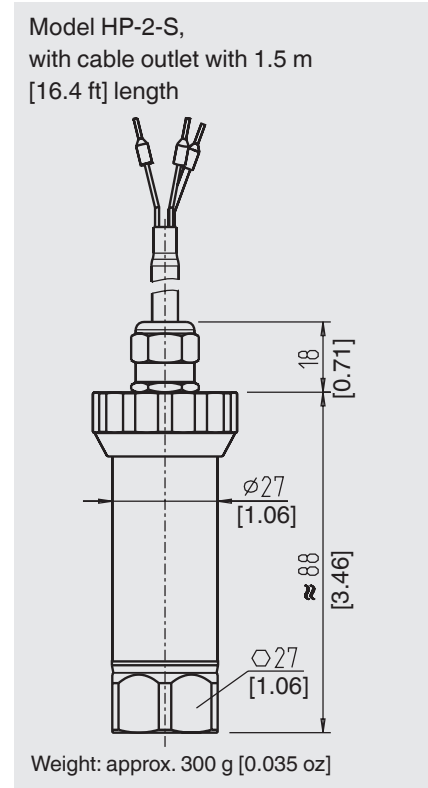
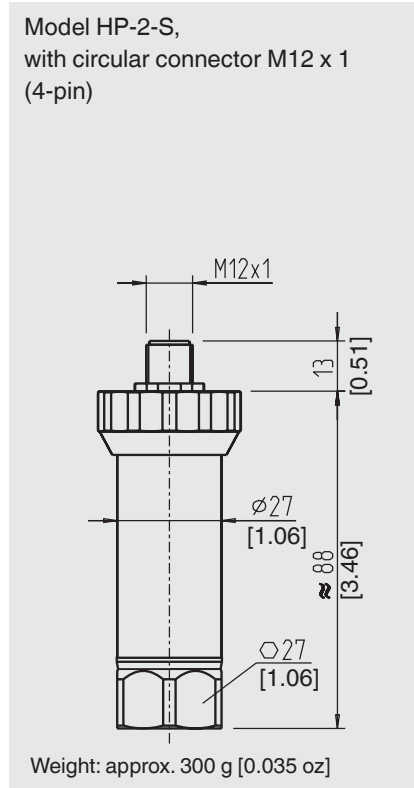
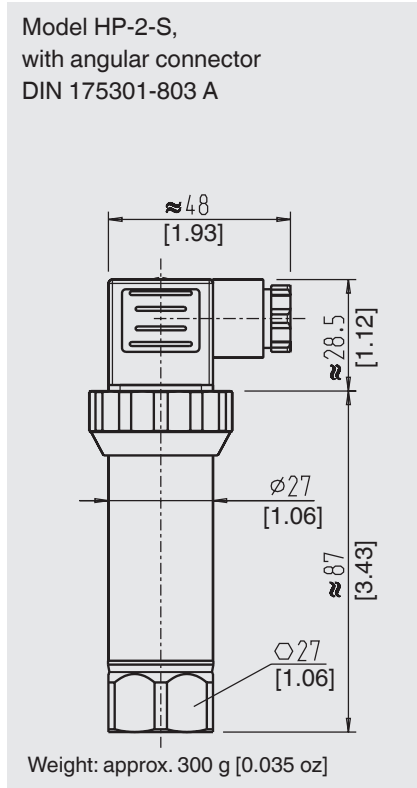
Test report	
Test report	5 measuring points

Certificates (option)

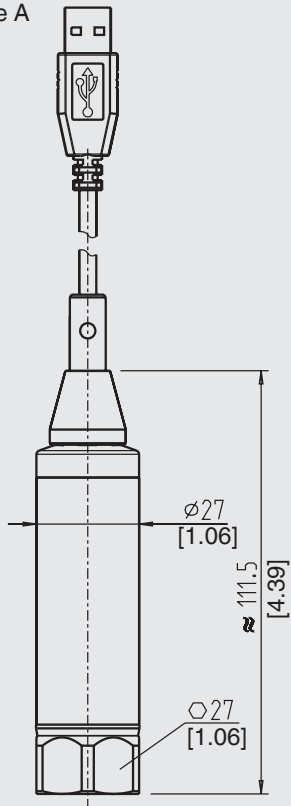
Certificates	
Certificates	<ul style="list-style-type: none"> 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy) 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy, calibration certificate)
Calibration	<ul style="list-style-type: none"> 3.1 inspection certificate per EN 10204 DAkkS calibration certificate (traceable and accredited in accordance with ISO/IEC 17025)

→ For approvals and certificates, see website

Dimensions in mm [in]

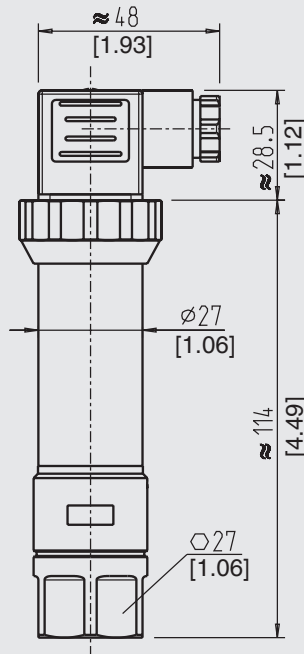


Model HP-2-S, with USB connector type A



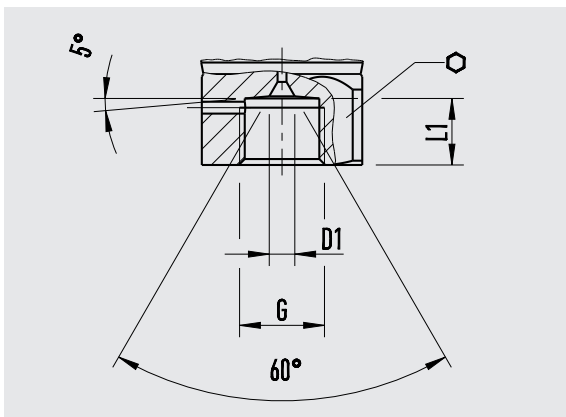
Weight: approx. 300 g [0.035 oz]

Model HP-2-D / Model HP-2-E, with optional cavitation and pressure-spike protection

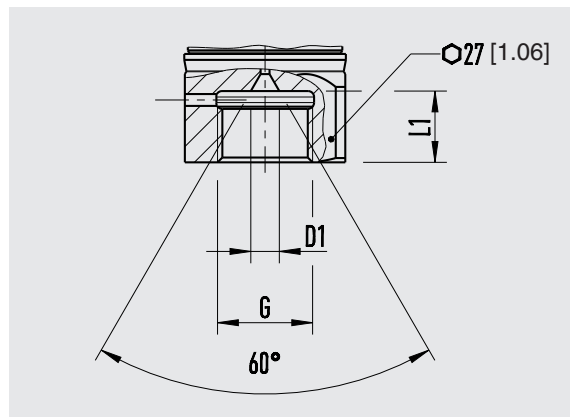


Weight: approx. 300 g [0.035 oz]

Process connections



G	L1	D1	SW
9/16-18 UNF	11.2 [0.047]	4.3 [0.169]	27



G	L1	D1
M16 x 1.5	12 [0.47]	4.8 [0.189]
M20 x 1.5	15 [0.59]	4.8 [0.189]

Accessories

Designation	Version	Order number
Mating connector		
Angular connector DIN 175301-803 A	Gland PG9	11427567
	With 2 m cable	11225793
	With 5 m cable	11250186
	Conduit ½ NPT	11022485
Circular connector M12 x 1, 4-pin, straight	Without cable	2421262
	With 2 m cable	11250780
	With 5 m cable	11250259
Circular connector M12 x 1, 4-pin, angled	Without cable	2421270
	With 2 m cable	11250798
	With 5 m cable	11250232
Sealings for mating connectors, blue (WIKA)		
Angular connector DIN 175301-803 A		1576240

Spare parts

Spare part kit for models HP-2-D and HP-2-E

Consisting of a replacement connection thread, replacement sealing disc and a mounting aid.

Spare part kit suitable for the following process connections:

Process connection	Version	Order number
M16 x 1.5 female thread	Model HP-2-D	14039895
	Model HP-2-E	14050403
M20 x 1.5 female thread	Model HP-2-D	13319923
	Model HP-2-E	14050404

Software

The full software is available to download as freeware from www.wika.com.

Ordering information

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

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