

# Pressure transmitter for highest pressure applications

## Up to 15,000 bar

### Model HP-2

WIKA data sheet PE 81.53



for further approvals and certificates see page 5



#### Applications

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

#### Special features

- Measuring ranges: 0 ... 1,600 to 0 ... 15,000 bar
- Accuracy: 0.5 % or 0.25 %
- Output signals: 4 ... 20 mA, DC 0 ... 5 V, DC 0 ... 10 V and USB 2.0
- Electrical connection: Angular connector DIN 175301-803 A, circular connector M12 x 1, USB connector and cable outlet
- Process connection: M16 x 1.5 female, M20 x 1.5 female, 9/16-18 UNF female



Pressure transmitter model HP-2

## Description

#### For highest pressures

The model HP-2 pressure transmitter has been specifically developed for demanding high pressure applications up to 15,000 bar. 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 transmitter 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 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 pressure medium, this protection is particularly recommended.

## 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.

Further details on request.

### 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 transmitter.

This system is particularly recommended when hairline cracks can occur.

Further details on request.

## Measuring ranges

Relative pressure						
bar	<b>Measuring range</b>	<b>0 ... 1,600</b>	<b>0 ... 2,500 <sup>1)</sup></b>	<b>0 ... 4,000 <sup>1)</sup></b>	<b>0 ... 5,000 <sup>1)</sup></b>	<b>0 ... 6,000</b>
	Overpressure limit	2,300	3,500	5,000	6,000	7,000
	Burst pressure	4,000	6,000	8,000	10,000	11,000
psi	<b>Measuring range</b>	<b>0 ... 7,000</b>	<b>0 ... 8,000</b>	<b>0 ... 10,000 <sup>1)</sup></b>	<b>0 ... 12,000 <sup>1)</sup></b>	<b>0 ... 15,000 <sup>1) 2)</sup></b>
	Overpressure limit	8,000	10,000	11,000	12,500	15,500
	Burst pressure	11,000	12,000	12,000	14,000	16,000
bar	<b>Measuring range</b>	<b>0 ... 23,000</b>	<b>0 ... 36,000</b>	<b>0 ... 58,000</b>	<b>0 ... 72,000</b>	<b>0 ... 87,000</b>
	Overpressure limit	33,300	50,500	72,500	87,000	101,500
	Burst pressure	58,000	87,000	116,000	145,000	159,500
psi	<b>Measuring range</b>	<b>0 ... 100,000</b>	<b>0 ... 115,000</b>	<b>0 ... 145,000</b>		
	Overpressure limit	116,000	145,000	159,000		
	Burst pressure	159,500	174,000	174,000		

1) Optionally also with a measuring cell from Elgiloy®

2) Adjustment at max. 12,500 bar, 15,000 bar is calculated.

The given measuring ranges are also available in MPa.

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.

### Service life

On request, since the service life depends on the actual pressure profile.

## Output signals

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	DC 0 ... 5 V DC 0 ... 10 V
USB	USB 2.0

Other output signals on request.

### Load in $\Omega$

- Current output (2-wire):  
 $\leq$  (power supply - 10 V) / 0.02 A
- Voltage output (3-wire):  
> maximum output signal / 1 mA

## Voltage supply

### Power supply

The power supply depends on the selected output signal

- 4 ... 20 mA: DC 10 ... 30 V
- DC 0 ... 5 V: DC 10 ... 30 V
- DC 0 ... 10 V: DC 14 ... 30 V
- USB 2.0: DC 5 V

### Current supply

- Current output (2-wire): Signal current, max. 35 mA
- Voltage output (3-wire): 8 mA
- USB output: 40 mA

## Reference conditions (per IEC 61298-1)

### Temperature

15 ... 25 °C

### Atmospheric pressure

860 ... 1,060 mbar

### Humidity

45 ... 75 % relative

### Power supply

- DC 24 V
- DC 5 V with USB output

### Mounting position

Calibrated in vertical mounting position with pressure connection facing downwards.

## Accuracy data

### Accuracy at reference conditions

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

#### Measuring ranges < 10,000 bar

$\leq \pm 0.50$  % of span (standard)

$\leq \pm 0.25$  % of span <sup>1)</sup>

1) only available for measuring ranges < 0 ... 10,000 bar

#### Measuring range = 10,000 bar

$\leq \pm 0.50$  % of span (standard)

$\leq \pm 0.25$  % of span, typical <sup>1)</sup>

1) only available for measuring ranges < 0 ... 10,000 bar

#### Measuring range = 12,000 or 15,000 bar

$\leq \pm 0.50$  % of span, typical

### Adjustability of zero point and span

- Current and voltage output:
  - Zero point:  $\pm 5$  % of span
  - Adjustment is made using potentiometers inside the instrument
- USB output:
  - Zero point: -5 ... +20 % of span
  - Span: -50 ... +5 % of span
  - Setting is made via "EasyCom 2011" software

### Temperature error at 0 ... 80 °C

- typical:  $\leq \pm 1.0$  % of span
- typical:  $\leq \pm 2.0$  % of span (special measuring ranges)
- maximum:  $\leq \pm 2.5$  % of span

### Long-term stability at reference conditions

- $\leq 0.1$  % of span/year
- $\leq 0.2$  % of span/year (special measuring ranges)

## Operating conditions

### Ingress protection (per IEC 60529)

For ingress protection see "Electrical connections"

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

### 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)

### Temperatures

- Medium: 0 ... +80 °C
- Ambient: -20 ... +80 °C
- Storage: -40 ... +85 °C

## Time response

### Settling time

- Current and voltage output: < 1 ms
- USB output: < 10 ms <sup>1)</sup>

1) other value on request

### Warming-up period

< 10 min

## Electrical connections

### Available connections

Electrical connection	Ingress protection	Wire cross-section	Cable diameter	Cable lengths
Angular connector DIN 175301-803 A	IP 65	max. 1.5 mm <sup>2</sup>	6 ... 8 mm	-
Circular connector M12 x 1 (4-pin)	IP 67	-	-	-
USB connector type A	Instrument: IP 67 Connector: IP 20	-	-	2 m
Cable outlet	IP 67	0.5 mm <sup>2</sup> (AWG 20)	6.8 mm	1.5 m

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

### Short-circuit resistance

S<sub>+</sub> vs. 0V

### Reverse polarity protection

U<sub>B</sub> vs. 0V

### Overvoltage protection

- DC 36 V
- DC 5.25 V with USB output

### Insulation voltage

DC 500 V

### Connection diagrams

#### Angular connector DIN 175301-803 A



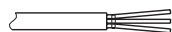
	2-wire	3-wire
U <sub>B</sub>	1	1
0V	2	2
S <sub>+</sub>	-	3

#### Circular connector M12 x 1 (4-pin)



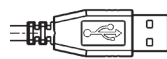
	2-wire	3-wire
U <sub>B</sub>	1	1
0V	3	3
S <sub>+</sub>	-	4

#### Cable outlet



	2-wire	3-wire
U <sub>B</sub>	brown	brown
0V	green	green
S <sub>+</sub>	-	white

#### USB connector type A



+5V	1
GND	4
D+	3
D-	2

#### Legend

U <sub>B</sub> , +5V	Positive power supply
0V, GND	Reference potential
S <sub>+</sub>	Positive output terminal
D+, D-	Negative output terminal

## Process connections

Process connection	Type of sealing	Maximum measuring range
M16 x 1.5 female, with sealing cone	60° sealing cone	0 ... 7,000 bar
M20 x 1.5 female, with sealing cone	60° sealing cone	0 ... 15,000 bar
9/16-18 UNF female	60° sealing cone	0 ... 7,000 bar

Other process connections on request.

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.

## Materials

### Wetted parts

- Process connection: Stainless steel 1.4534
- Sensor: Stainless steel 1.4534 or 2.4711 Elgiloy®

For hydrogen as a medium, contact the manufacturer.

## CE conformity

### Pressure equipment directive

97/23/EC

### EMC directive

2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

### RoHS conformity

Yes

## Approvals

- **GOST-R**, import certificate, Russia
- **GOST**, metrology/measurement technology, Russia
- **CRN**, safety (e.g. electr. safety, overpressure, ...), Canada

## Certificates

### Supplied documents

- Test report, 5 measuring points
- Operating instructions

The required documents can be ordered separately.

### ■ 2.2 Test certificate

- State-of-the-art manufacturing
- Material proof, wetted metal parts
- Confirmation of the class and indication accuracy

### ■ 3.1 Acceptance test certificate

- Material proof, wetted metal parts
- Material proof, wetted metal parts with suppliers' certificate (melting analysis)
- Confirmation of the class and indication accuracy

### ■ Calibration certificate

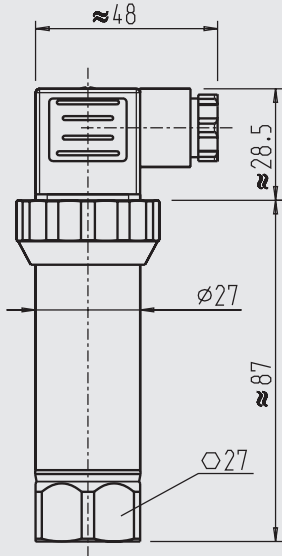
- 3.1 Factory calibration certificate
- DKD/DAkkS calibration certificate

Approvals and certificates, see website

## Dimensions in mm

### Model HP-2-S

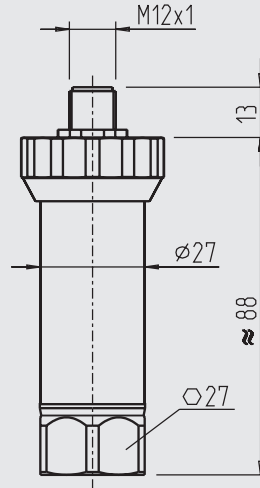
with angular connector  
DIN 175301-803 A



Weight: approx. 300 g

### Model HP-2-S

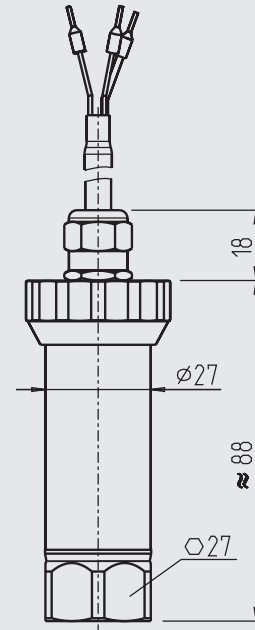
with circular connector M12 x 1  
(4-pin)



Weight: approx. 300 g

### Model HP-2-S

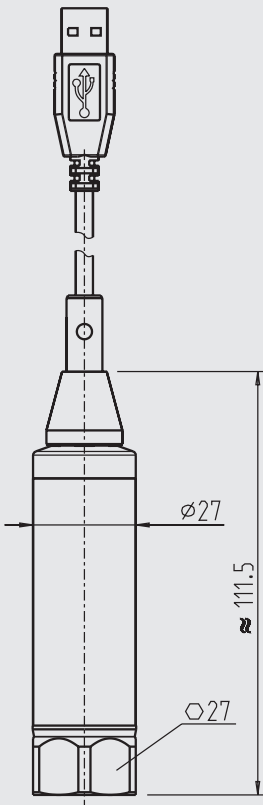
with cable outlet with 1.5 m length



Weight: approx. 300 g

### Model HP-2-S

with USB connector type A

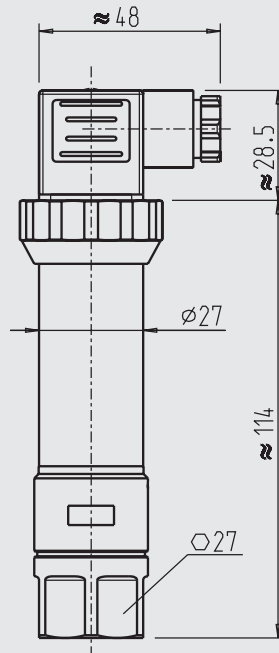


Weight: approx. 300 g

### Model HP-2-D

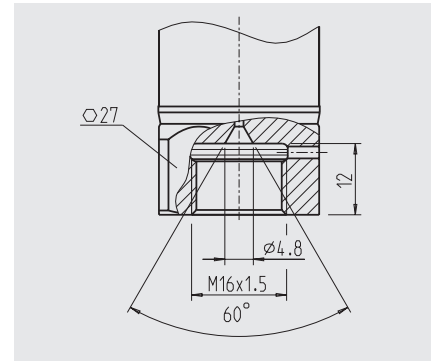
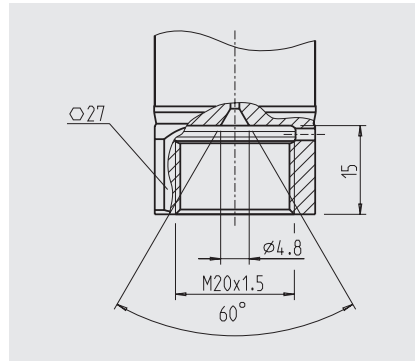
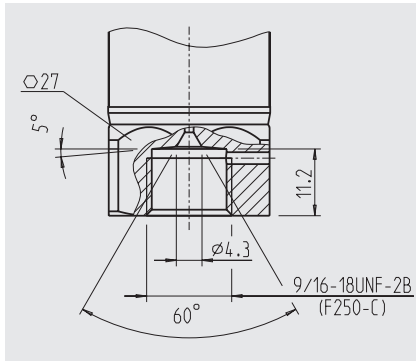
### Model HP-2-E

with optional cavitation and pressure-spike protection



Weight: approx. 300 g

## Process connections



## Accessories and spare parts

### Mating connectors

Designation	Order number		
	without cable	with 2 m cable	with 5 m cable
<b>Angular connector DIN 175301-803 A</b>			
■ with gland, metric	11427567	11225793	11250186
■ with gland, conduit	11022485	-	-
<b>Circular connector M12 x 1, 4-pin</b>			
■ straight	2421262	11250780	11250259
■ angled	2421270	11250798	11250232

### Sealings for mating connectors

Designation	Order number
Angular connector DIN 175301-803 A	1576240

### Spare-parts kit for models HP-2-D and HP-2-E

Consisting of a replacement connection thread, replacement sealing disc and a mounting aid.  
Spare-parts kit suitable for the following process connections:

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

### Software

The full software is available to download as freeware from [www.wika.com](http://www.wika.com).

The software is also available on CD (order no.: 11478901).

### Ordering information

Model / Measuring range / Output signal / Accuracy at reference conditions / Electrical connection / Process connection

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