DATA SHEET

Type 8318

Pressure transmitter with IO-Link interface

- Metallic thin film strain gauges measuring principle
- Process connections: G, NPT in ¼", G ¾" with hygienic flush diaphragm or clamp according to DIN 32676
- Measuring ranges for relative pressure from -0.4…+0.4 bar up to -1…+12.0 bar
- Available switching functions: PNP or NPN
- Access to measured value, device status and settings via IO-Link interface, very easy sensor replacement

Product variants described in the data sheet may differ from the product presentation and description.

Type description

The pressure transmitter is used to measure and monitor relative and absolute (on request) pressure in liquids and gases. The effect of the pressure on the sensor element generates a signal which is amplified, digitised and processed.

Instead of an analogue output, this device offers a digital interface IO-Link. This allows bidirectional data transfer with any IO-Link master. Data access occurs via the available standardised IODD.

The IO-Link corresponds to the specification version 1.1. The bidirectional communication is used to read process data, parameters, diagnostic information and status messages as well as to set parameters. The two green LEDs are permanently lit as soon as power is supplied to the device. Once an IO-Link connection has been established, the LEDs flash.

The switching behaviour and the switching thresholds of the digital outputs (max. 2; “PNP” or “NPN”) can - like many other parameters - be individually configured.

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1. General technical data

Product properties	
Material	
Make sure the device materials are compatible with the fluid you are using. Further information can be found in chapter "3.1. Bürkert resistApp" on page 7.	
Non wetted parts	
Housing	Stainless steel 1.4301 (304)
Fixed connector	Stainless steel 1.4301 (304)
Wetted parts	
Process connection	Stainless steel 1.4404 (316L)
Measuring element	• Membrane in stainless steel 1.4435 (316L) • Welding ring in stainless steel 1.4404 (316L)
Dimensions	Further information can be found in chapter "4. Dimensions" on page 8.
Weight	Approx. 160 g
Measurement technology	Metallic thin film strain gauge
Measured quantity	Relative pressure (absolute pressure on request)
Measuring range	• -0.4…+0.4 bar • -1…+1 bar • -1…+2.5 bar • -1…+5.0 bar • -1…+12.0 bar
Monitoring	Measuring circuit: IO-Link event configurable and is available as device status • Process data invalid • Measuring range overflow • Measuring range underflow • Device hardware fault
Performance data	
Compensated ambient temperature range (T_{amb})	-20…+80 °C (-4…+176 °F)
Temperature coefficient (Tc)	**In compensated T° range**
Average Tc of zero	Variant with measuring range • -0.4…+0.4 bar: 0.020 %/°C • -1…+1 bar: 0.015 %/°C • -1…+2.5 bar: 0.015 %/°C • -1…+5.0 bar: 0.010 %/°C • -1…+12.0 bar: 0.010 %/°C
Average Tc of measuring span	Variant with measuring range • -0.4…+0.4 bar: 0.010 %/°C • -1…+1 bar: 0.010 %/°C • -1…+2.5 bar: 0.010 %/°C • -1…+5.0 bar: 0.010 %/°C • -1…+12.0 bar: 0.010 %/°C
Thermal hysteresis	Variant with measuring range • -0.4…+0.4 bar: 0.15 % of measuring span • -1…+1 bar: 0.10 % of measuring span • -1…+2.5 bar: 0.10 % of measuring span • -1…+5.0 bar: 0.10 % of measuring span • -1…+12.0 bar: 0.10 % of measuring span
Zero offset	Variant with measuring range • -0.4…0.4 bar: 0.30 % of measuring span • -1…+1 bar: 0.15 % of measuring span • -1…+2.5 bar: 0.15 % of measuring span • -1…+5.0 bar: 0.10 % of measuring span • -1…+12.0 bar: 0.10 % of measuring span
Measuring resolution	14 bit

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Measurement deviation	• At 20 °C [1.], variant with measuring range – -0.4…+0.4 bar: 0.7 % of measuring span – -1…+1 bar: 0.6 % of measuring span – -1…+2.5 bar: 0.5 % of measuring span – -1…+5.0 bar: 0.5 % of measuring span – -1…+12.0 bar: 0.5 % of measuring span • At -20 °C…+80 °C [2.], variant with measuring range – -0.4…+0.4 bar: 2.0 % of measuring span – -1…+1 bar: 1.8 % of measuring span – -1…+2.5 bar: 1.3 % of measuring span – -1…+5.0 bar: 1.2 % of measuring span – -1…+12.0 bar: 1.0 % of measuring span
Linearity [3.]	Variant with measuring range • -0.4…+0.4 bar: 0.3 % of measuring span • -1…+1 bar: 0.3 % of measuring span • -1…+2.5 bar: 0.3 % of measuring span • -1…+5.0 bar: 0.3 % of measuring span • -1…+12.0 bar: 0.25 % of measuring span
Hysteresis	Variant with measuring range • -0.4…+0.4 bar: 0.05 % of measuring span • -1…+1 bar: 0.05 % of measuring span • -1…+2.5 bar: 0.05 % of measuring span • -1…+5.0 bar: 0.05 % of measuring span • -1…+12.0 bar: 0.05 % of measuring span
Response time	• Digital switching output: ≤ 7 ms • IO-Link: ≤ 9 ms
Overload limit [4.]	Variant with measuring range • -0.4…+0.4 bar: 1 bar • -1…+1 bar: 4 bar • -1…+2.5 bar: 16 bar • -1…+5.0 bar: 40 bar • -1…+12.0 bar: 100 bar
Burst pressure	Variant with measuring range • -0.4…+0.4 bar: 1.5 bar • -1…+1 bar: 8 bar • -1…+2.5 bar: 24 bar • -1…+5.0 bar: 60 bar • -1…+12.0 bar: 150 bar
Stability [5.]	Per year, variant with measuring range • -0.4…+0.4 bar: ≤ 0.3 % of measuring span • -1…+1 bar: ≤ 0.2 % of measuring span • -1…+2.5 bar: ≤ 0.2 % of measuring span • -1…+5.0 bar: ≤ 0.2 % of measuring span • -1…+12.0 bar: ≤ 0.2 % of measuring span
Behaviour of measuring range (IO-Link specification)	• Underrange: – linear up to -1.5 % of measuring span – error value: 1 x 10^{37} • Overrange: – linear up to 5 % of measuring span – error value: 2 x 10^{37}

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Electrical data	
Operating voltage	• In IO-Link operation: 18…32 V DC, filtered and regulated • In switch operation: 9.6…32 V DC, filtered and regulated • Nominal voltage: 24 V DC
Power source (not supplied)	The auxiliary energy of the pressure sensor must meet SELV requirements; optionally, an energy-limited current circuit according to paragraph 9.3 of DIN EN 61010-1 and UL 61010-1 can be used.
DC reverse polarity protection	Yes
Overvoltage protection	No
Short circuit protection	Yes (clocked)
Protection class	Class III according to EN 61140
Current consumption	• In idle operation: ≤10 mA • In IO-Link operation: ≤12 mA • In switch operation: ≤250 mA (with two digital outputs)
Galvanic isolation	To pressure connection available
Signal processing	Input filter: • digital filter, second order • filter time constant can be set
Output	
Number of outputs	• 1 digital output in IO-Link operation • 2 digital outputs for switch operation (SIO mode; SIO = standard IO)
Switching function configurable	• Hysteresis function (Hysteresis configurable) or window function (fixed setting, symmetrical, ±0.25 % of the measuring range) • NC or NO contact • Digital output PNP or NPN • Switch-on/switch-off delay (0…100 s)
Switching current	≤100 mA per output
Current limiting	Yes
Voltage drop at switching transistor	≤2 V DC
Recommended connection cable	4-wire unshielded cable, max. 20 m
Medium data	
Fluid	Liquid and gaseous medium
Fluid temperature	-40…+125 °C (-40…+257 °F)
Process/Pipe connection & communication	
Process connection	• G ¼" or NPT ¼" (according to EN 837) • G ¾" flush diaphragm (according to ISO 228-1) • Clamp DN 10/20 (according to DIN 32676) Further information on the process connection can be found in chapter "5.3. Ordering chart" on page 9.
Electrical connection	M12×1 male connector, 4 pins, A-coded, non rotating (IO-Link Port Class A)
Digital communication: IO-Link	
Communication interface	IO-Link device V1.1, downward compatible to V1.0
Baud rate (data transfer rate)	COM 3 (230.4 kBaud)
Cycle time	Min. 2 ms
IO device description (IODD)	Depending on the ordered measurement range See "Device Description Files" on the website in the Software chapter **Type 8318** ▸ or available at **https://ioddfinder.io-link.com**
Approvals and conformities	
Directives	
CE directive	Further information on the CE Directive can be found in chapter "2.2. Standards" on page 7.
Pressure equipment directive	• The device does not meet the requirements for "safety accessories" within the meaning of the pressure equipment directive 2014/68/EU. • Complying with article 4, paragraph 1 of 2014/68/EU directive Further information on the pressure equipment directive can be found in chapter "2.3. Pressure Equipment Directive (PED)" on page 7.

Environment and installation	
Ambient temperature	Operation and storage: -40…+85 °C (-40…+185 °F)
Relative air humidity	• During operation: ≤100 %, without condensation on the outer housing surface of the device • During storage: ≤90 %, without condensation
Climate class	3K7 according to EN 60721-3-3
Application range	Indoors and outdoors Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions.
Degree of protection	IP65 according to DIN EN 60529, with female connector screwed on (for absolute pressure variant IP65/IP67)
Mounting position	• Installation: unrestricted • Calibration: device upright, process connection at the bottom

1.) Includes linearity, hysteresis, repeatability, deviation of initial measuring range value and final measuring range value.
2.) Includes linearity, hysteresis, repeatability, deviation of initial measuring range value and final measuring range value, thermal influence on measuring range start and measuring span.
3.) Linearity according to limit point setting
4.) All sensors are vacuum proof.
5.) Reference conditions EN 61298-1

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2. Approvals and conformities

2.1. Conformity

In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

2.2. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

2.3. Pressure Equipment Directive (PED)

The device conforms to article 4, paragraph 1 of the Pressure Equipment Directive (PED) 2014/68/EU under the following conditions:

Device used on a pipe

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure (in bar), DN = nominal diameter of the pipe

Type of fluid	Conditions
Fluid group 1, article 4, paragraph 1.c.i	DN ≤ 25
Fluid group 2, article 4, paragraph 1.c.i	DN ≤ 32 or PS*DN ≤ 1000
Fluid group 1, article 4, paragraph 1.c.ii	DN ≤ 25 or PS*DN ≤ 2000
Fluid group 2, article 4, paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000

Device used on a vessel

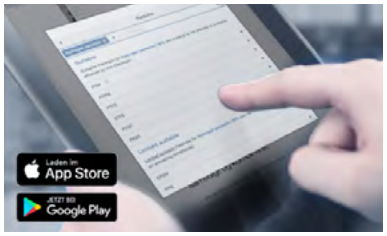
Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure (in bar), V = vessel volume

Type of fluid	Conditions
Fluid group 1, article 4, paragraph 1.a.i	V > 1 L and PS*V ≤ 25 bar.L or PS ≤ 200 bar
Fluid group 2, article 4, paragraph 1.a.i	V > 1 L and PS*V ≤ 50 bar.L or PS ≤ 1000 bar
Fluid group 1, article 4, paragraph 1.a.ii	V > 1 L and PS*V ≤ 200 bar.L or PS ≤ 500 bar
Fluid group 2, article 4, paragraph 1.a.ii	PS > 10 bar and PS*V ≤ 10000 bar.L or PS ≤ 1000 bar

3. Materials

3.1. Bürkert resistApp



Bürkert resistApp – Chemical resistance chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check

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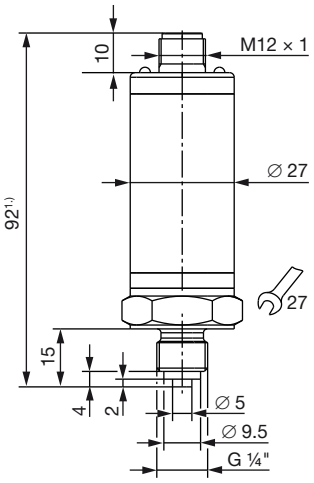
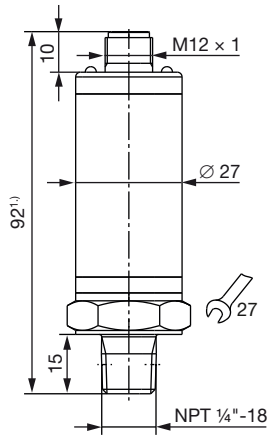
4. Dimensions

Note:
Dimensions in mm, unless otherwise stated

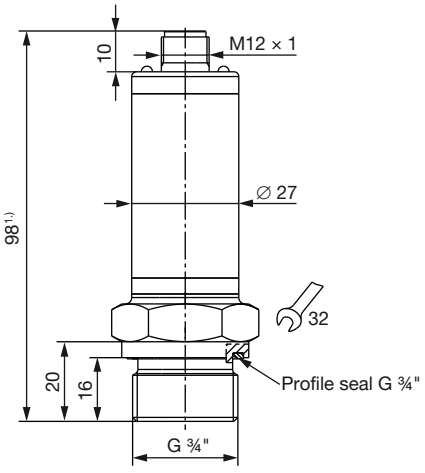
With G ¼" process connection
according to EN 837



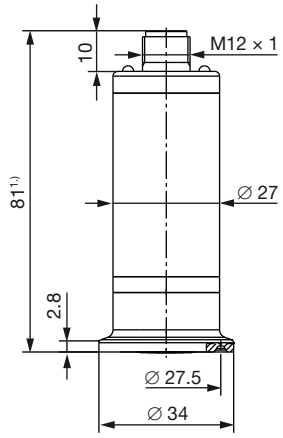
With NPT ¼" process connection
according to EN 837



With G ¾" front-flush process connection
according to ISO 228-1



With clamp DN10/20 process connection
according to DN 32676



1.) The total height is increased by the height of the used female connector and cable .

5. Ordering information

5.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

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5.2. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

5.3. Ordering chart

Note:
The following variants have

- an operating voltage depending on operation mode (IO-Link: 18…32 V DC, switch: 9.6…32 V DC or nominal: 24 V DC)
- an IO-Link digital interface (according to specification version 1.1) or digital outputs (SIO mode; SIO = standard IO)

Process connection	Pressure range (relative pressure) [bar]	Burst pressure (relative pressure) [bar]	Article no.
G ¼" according to EN 837	-0.4…+0.4	1.5	574614
	-1…+1	8	574615
	-1…+2.5	24	574616
	-1…+5	60	574617
	-1…+12	150	574618
NPT ¼" according to EN 837	-0.4…+0.4	1.5	574619
	-1…+1	8	574620
	-1…+2.5	24	574621
	-1…+5	60	574622
	-1…+12	150	574623
Clamp DN 10/20 according to DIN 32676	-0.4…+0.4	1.5	574624
	-1…+1	8	574625
	-1…+2.5	24	574626
	-1…+5	60	574627
	-1…+12	150	574628
G ¾" flush diaphragm according to ISO 228-1	-0.4…+0.4	1.5	574629
	-1…+1	8	574630
	-1…+2.5	24	574631
	-1…+5	60	574632
	-1…+12	150	574633

Further variants on request

Process connection

- G ½" according to EN 837
- G ¼" and G ½" according to DIN 3852-11
- Clamp DN 25/32/40 (50.5 mm) and clamp DN 50 (64 mm) according to DIN 32676

Pressure

- Relative pressure: up to 600 bar or 8700 PSI
- Absolute pressure: up to 100 bar or 1450 PSI

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