

Series 26X

High-precision piezoresistive level probe

Features

- RS485 interface can be combined with an analog interface
- Analog interface can be ranged via RS485 interface (turn-down)
- Modbus RTU protocol for process values and configuration
- Excellent long-term stability
- For many years of maintenance-free operation, submerged in the medium

Technology

- Media isolated piezoresistive pressure sensor
- Robust stainless-steel housing with high-quality cable gland
- High-quality pressure transducer and tried-and-tested mathematical compensation

Typical applications

- Hydrostatic pressure measurement
- Level measurement: groundwater, surface water
- Fill level measurement: water tanks, fuel tanks



Accuracy

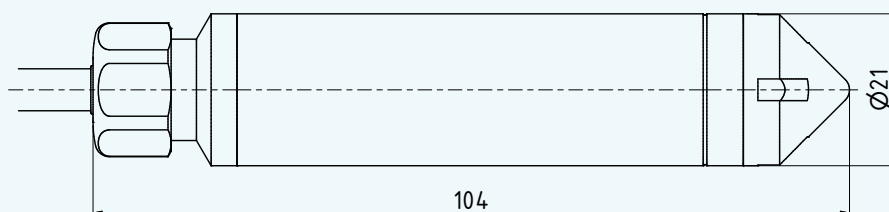
± 0,1 %FS

Total error band

± 0,25 %FS @ 0...50 °C

Pressure ranges

from 0...0,1 to 0...25 bar



Series 26X – Specifications

Standard pressure ranges

| Water column approx. | Relative pressure PR | Absolute pressure PAA | Proof pressure |
|--|--|---|-----------------------------|
| 0...1 | 0...0,1 | | 3 |
| 0...1,6 | 0...0,16 | | |
| 0...2,5 | 0...0,25 | | |
| 0...4 | 0...0,4 | | |
| 0...6 | 0...0,6 | | |
| 0...10 | 0...1 | 0,8...2 | 9 |
| 0...16 | 0...1,6 | 0,8...2.6 | |
| 0...25 | 0...2,5 | 0,8...3.5 | |
| 0...40 | 0...4 | 0,8...5 | 30 |
| 0...60 | 0...6 | 0,8...7 | |
| 0...100 | 0...10 | 0,8...11 | |
| 0...160 | 0...16 | 0,8...17 | 40 |
| 0...250 | 0...25 | 0,8...26 | |
| mH2O | bar rel. | bar abs. | bar |
| Analog interface also rangeable to other units | Reference pressure at ambient pressure | Reference pressure at 0 bar abs. (vacuum) | based on reference pressure |

Performance

Pressure

| | | |
|----------------------------------|--|--|
| Accuracy @ RT (20...25 °C) | $\leq \pm 0,1$ %FS | Non-linearity (best fitted straight line BFSL), pressure hysteresis, non-repeatability, zero point deviation and amplification deviation |
| Total error band (0...50 °C) | $\leq \pm 0,25$ %FS | Max. deviation within the compensated pressure and temperature range. Experience shows that, outside the compensated temperature range, the total error band is expanded by 0,1 %FS. |
| Compensated temperature range | 0...50 °C | Other temperature ranges within -20...85 °C possible as an option |
| Long-term stability | $\leq \pm 0,15$ %FS | Per year under reference conditions |
| Degree of dependency on location | $\leq \pm 1,5$ mbar | Calibrated in vertical installation position with pressure connection facing downwards |
| Resolution | 0,002 %FS | Digital |
| Signal stability | 0,01 %FS | Digital noise-free |
| Internal measurement rate | ≥ 1800 Hz | For version «3-wire + digital (0...10 V. 0...5 V)» > 6000 Hz |
| Pressure range reserve | ± 10 % | Outside the pressure range reserve, +Inf/-Inf is displayed. If there is an error in the device, NaN is displayed. |
| Note | For pressure ranges < 1 bar, all data apply with reference to a full-range signal (FS) of 1 bar. | |

Temperature

| | | |
|---------------------------|-------------------|--|
| Accuracy | $\leq \pm 1,5$ °C | The temperature is measured on the media-isolated pressure sensor (silicon chip). The specifications apply within the compensated temperature range. |
| Resolution | $\leq 0,01$ °C | |
| Internal measurement rate | > 10 Hz | |

Series 26X – Specifications

Electrical data

| Connectivity | digital | 2-wire + digital | 3-wire + digital | |
|---|--|------------------|------------------|------------|
| Analog interface | | 4...20 mA | 0...10 V | 0...5 V |
| Digital interface | RS485 | RS485 | RS485 | RS485 |
| Power supply | 3,2...32 VDC | 8...32 VDC | 13...32 VDC | 8...32 VDC |
| Power consumption (without communication) | < 8 mA | 3,5...22.5 mA | < 8 mA | < 8 mA |
| RS485 voltage insulation | ± 32 VDC | ± 18 VDC | ± 32 VDC | ± 32 VDC |
| Note | Disturbance of the 4...20 mA signal occurs during communication through the digital interface. 3-wire types are suitable for simultaneous operation of the analog and digital interface. | | | |

| | |
|---|-------------------|
| Start-up time (power supply ON) | < 250 ms |
| Overvoltage protection and reverse polarity | ± 32 VDC |
| GND case insulation | > 10 MΩ @ 300 VDC |

Analog interface

| | | |
|--------------------|---|----------------------------|
| Load resistance | < (U - 8 V)/25 mA | 2-wire |
| | > 5 kΩ | 3-wire |
| Limiting frequency | ≥ 300 Hz | 2-wire |
| | ≥ 1000 Hz | 3-wire (0...10 V, 0...5 V) |
| Note | Filter properties can be adjusted by the customer | |

Digital interface

| | | |
|-------------------------|------------------------|---|
| Type | RS485 | Half-duplex |
| Communication protocols | Modbus RTU | |
| | KELLER bus protocol | Proprietary |
| Identification | Class.Group: 5.24 | Standard settings: bus address 1, baud rate 9600 bit/s. |
| Unit of pressure | bar | |
| Unit of temperature | °C | Other default settings available on request. Can be reconfigured via software by the customer later. |
| Data type | Float32 and Int32 | |
| Baud rates | 9600 and 115'200 bit/s | |
| Lines up to | 1,2 km | |

Electrical connection

| | | |
|------------------------------|-------------------------------------|-------------------------|
| Cable for water applications | PR: polyethylene (PE) ø 5,8 mm | Integral reference tube |
| | PAA: polyolefin (PE-based) ø 5,8 mm | |
| Cable for fuel applications | PR: TPE-E ø 6,1 mm | Integral reference tube |
| | PAA: TPE-E ø 4,7 mm | |

Electromagnetic compatibility

| | | |
|---------------------------------------|---|----------------------------|
| CE conformity as per 2014/30/EU (EMC) | EN 61326-1 / EN 61326-2-3 / EN 61000-6-1 / EN 61000-6-2 / EN 61000-6-3 / EN 61000-6-4 | |
| Lightning protection standard | EN 61000-4-5 | Line-line: 50 A @ 8/20 µs |
| | | Line-CASE: 200 A @ 8/20 µs |
| Extended lightning protection | optional | Line-line: 10 kA @ 8/20 µs |
| | | Line-CASE: 2 kA @ 8/20 µs |

Series 26X – Specifications

Mechanical data

Wetted parts

| | | |
|--|----------------------------|---------------|
| Housing and optional pressure connection | Stainless steel AISI 316L | |
| Pressure transducer separating diaphragm | Stainless steel AISI 316L | |
| Pressure transducer seal (internal) | FKM | |
| Cable gland seal (internal) | FKM | |
| Protective cap | POM | |
| Cable sheath | PR: polyethylene (PE) | Medium: water |
| | PAA: polyolefin (PE-based) | |
| | PR/PAA: TPE-E | Medium: fuels |

Other materials

| | | |
|---------------------------------|--------------|-------------------|
| Pressure transducer oil filling | Silicone oil | Others on request |
|---------------------------------|--------------|-------------------|

Further details

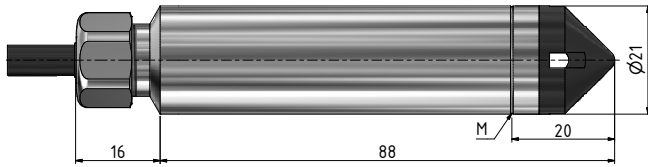
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|--------------------------|-------------------------------------|----------------------------|
| Pressure connection | Flush diaphragm with protective cap | See Dimensions and options |
| Diameter x length | ø 21 mm x approx. 104 mm | |
| Weight (excluding cable) | approx. 100 g | |

Ambient conditions

| | | | |
|---------------------------|-----------------------------|----------------|--|
| Media temperature range | -20...85 °C | | Icing not permitted |
| Ambient temperature range | -20...85 °C | | |
| Storage temperature range | -20...85 °C | | |
| Protection | IP68 | Cable Gland | for relative pressure, cable with integrated capillary |
| Vibration resistance | 10 g, 10...2000 Hz, ± 10 mm | IEC 60068-2-6 | |
| Shock resistance | 50 g, 11 ms | IEC 60068-2-27 | |

Series 26X – Dimensions and options

Electrical connections



M: marking of diaphragm position

| Cable gland | 2-wire | 3-wire |
|-------------|----------------|----------------|
| Cable | 4...20 mA | 0...max. 10 V |
| | WH OUT/GND | WH GND |
| | RD n.c. | RD +OUT |
| | BK +Vs | BK +Vs |
| | BU RS485A | BU RS485A |
| | YE RS485B | YE RS485B |
| | Shield on CASE | Shield on CASE |

Available pressure connections

Standard

Optional

| Flush diaphragm | G1/4 |
|---------------------|-------------------|
| | |
| With protective cap | DIN EN ISO 1179-2 |

Other customer-specific options

- Other compensated pressure ranges
- Other temperature ranges within -20...85 °C
- Other cable sheath materials
- Extended lightning protection
- Wetted parts available in Hastelloy C-276 and Titanium
- Integration of application-specific calculations: e.g. tank content calculations
- Modifications to customer-specific applications

Examples of related products

- Series 26Xi: level probe with SDI-12 interface
- Series 36XW: level probe with maximum performance (pressure) with RS485 and analog interface
- Series 36XiW: level probe with maximum performance (pressure and temperature) with RS485 or SDI-12 interface
- Series 36XiW-CTD: level probe with maximum performance (pressure, temperature and conductivity) with RS485 or SDI-12 interface
- OEM series: pressure transducer with electronics (e.g. series 9LX, 10LX) for integration in one's own systems

Series 26X – Software, scope of delivery and accessories

Interface

The X-line products have a digital interface (RS485 half-duplex), which supports the MODBUS RTU and KELLER bus protocols. Details of the communication protocols can be found at www.keller-druck.com. Documentation, a Dynamic Link Library (DLL) and various programming examples are available for integrating the communication protocol into your own software.

Interface converter

The connection to a computer is established via an RS485-USB interface converter. To ensure smooth operation, we recommend the K-114 with the corresponding mating plug, robust driver module, fast RX/TX switching and connectable bias and terminating resistors.

«CCS30» software

The licence-free software CCS30 is used to carry out configurations and record measured values.

Measurement collection

- Live visualisation
- Adjustable measuring and storage interval
- Export function
- Parallel recording in bus operation
- Up to 100 measured values per second

Configuration

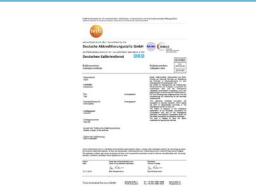


- Call up of information (pressure and temperature range, software version, serial number etc.)
- Readjustment of zero point and amplification
- Rescaling of analog output (unit, pressure range)
- Adjustment of low-pass filter
- Selection of instrument address and baud rate

Scope of delivery

KELLER test report



Accessories

| Calibration certificate | Interface converter | |
|---|---|--|
|  |  |  |
| <p>Issued by the external calibration laboratory of the German accreditation body DAkkS or the Swiss accreditation body SAS</p> | <p>K-114</p> <ul style="list-style-type: none"> • Analog measurement 0...10 V and 4...20 mA • 12 V measuring device supply via USB • USB interface electrically isolated • Bias and terminating resistors can be activated | <p>K-114BT</p> <ul style="list-style-type: none"> • With Bluetooth interface and integrated rechargeable battery • Wireless connection via Serial Port Profile (SPP) • 15 V measuring device supply from the converter's internal rechargeable battery |