

Data logger

# ESS3 R1



Data logger with a radial sensor

The devices in the ESS3 R1 series measure pressure, differential pressure, and temperature in gas, water, and district heating networks and are also suitable for liquid and gaseous media in industry.

The battery-powered, modular devices consist of a control unit (housing, processor, software, display), sensor, and battery. They are approved for use in potentially explosive areas (zones 1 and 2) and are waterproof to protection class IP68.

The control unit stores measured values in a non-volatile memory and continuously displays current values on the screen. Data is transferred to the PC contactlessly via an optical IrDA interface (USB).

A lithium battery enables operation for several years; status and remaining runtime are continuously monitored and displayed.

The TfsWin III software is used to configure and read out the logger and to display the measurement data graphically. Alternatively, it can be operated directly using buttons.

Sensor

The sensor is the metrological link to the application. Performance and user-friendliness are therefore the focus:

- Sensors can be replaced by the user and are immediately ready for use without recalibration
- Stainless steel-encapsulated, piezo-resistive sensor with high long-term stability, resistant to aggressive media
- High resolution of measured values; multiple measuring ranges possible for one sensor
- Temperature measurement of the media temperature
- High measurement rates due to high natural resonance frequency
- High overpressure safety and high burst pressure
- Special designs, e.g., for O2 measurement
- Sensibly graduated fixed measuring ranges as well as user-configurable ranges, with various accuracy classes up to ±0.05% of full scale (FS)
- Temperature sensors available as probe-type sensors or suitable for use in thermowells.

Measured parameters

- Relative pressure
- Absolute pressure
- Differential pressure
- Barometric pressure
- Temperature

Applications

- Fault analysis in gas networks
- Monitoring in gas pressure regulating and metering stations
- Pipeline network calculations
- Leak testing according to G469 / W400-2

Technical Data ESS3 R1

|                                        |                                                                                                                                                                                              |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application                            | Measurement and recording of data (pressure and temperature) for fault analysis, monitoring of pipeline networks, and gas pressure regulating stations.                                      |
| Sensor connections                     | One radial sensor connection (M30) for a pressure or temperature sensor.                                                                                                                     |
| Explosion protection class             | Ex II 2G Ex ib IIC T4 Gb                                                                                                                                                                     |
| Protection classes, housing            | Depending on the sensor: IP 67 for relative pressure, IP 68 for absolute and differential pressure as well as temperature<br>Dimensions (W × H × D) [mm]: 108 × 162 × 80<br>Weight [kg]: 1.2 |
| Measuring ranges – pressure sensors    | Relative pressure:<br>0 ... 100/250 mbar and<br>0 ... 1/2.5/10/25/100 bar<br>Differential pressure:<br>0 ... 100 mbar and 0 ... 1/10 bar<br>Other measuring ranges available on request      |
| Measuring ranges – temperature sensors | -10 °C ... +40 °C and<br>-30 °C ... +150 °C                                                                                                                                                  |
| Measurement interval                   | 125 ms ... 6 h                                                                                                                                                                               |
| Initial measurement accuracy           | Depending on the sensor (up to ±0.05 % of full scale, FS)                                                                                                                                    |
| Resolution                             | Up to 0.004 % of full scale (FS)                                                                                                                                                             |
| Communication interfaces               | IrDA; display; keyboard                                                                                                                                                                      |
| Operating data                         | Battery operation: up to 8 years<br>Current value; maximum and minimum values, as well as differential value, memory usage, and battery status                                               |
| Display indication                     | Time and date; upper and lower alarm thresholds; averaging (2 ... 600 values); resolution; measurement location name (29 characters); storage method (rolling/static)                        |
| Settings                               | Via menu using the keyboard; via TfsWin III software using IrDA interface cable                                                                                                              |
| Operation                              | Via menu using the keyboard; via TfsWin III software using IrDA interface cable                                                                                                              |
| Data storage                           | 250,000 date-time values / 512 kB                                                                                                                                                            |
| Typical range                          | 2 years (with data compression)                                                                                                                                                              |
| Software                               | TfsWin III for configuration, visualization, analysis, and archiving of data                                                                                                                 |

Pressure sensor

Media compatibility: All liquids and gases that are compatible with stainless steel 1.4301 and sealing material NBR.

| Measuring range                                         | Initial Accuracy % of FS <sup>1)</sup> |                     |                    |                                                  |
|---------------------------------------------------------|----------------------------------------|---------------------|--------------------|--------------------------------------------------|
|                                                         | Standard<br>± 0,4 %                    | Premium<br>± 0,09 % | Select<br>± 0,05 % | Select plus<br>± 0,05 % <<br>5mbar <sup>2)</sup> |
| 0 ... 100 mbar rel.                                     | x                                      | x                   | ~                  | ~                                                |
| 0 ... 100 mbar Differential pressure                    | x                                      | ~                   | ~                  | ~                                                |
| 0 ... 250 mbar rel.                                     | x                                      | x                   | ~                  | ~                                                |
| 0 ... 1 bar rel.                                        | x                                      | x                   | x                  | ~                                                |
| 0 ... 1 bar Differential pressure                       | x                                      | ~                   | ~                  | ~                                                |
| 0 ... 2,5 bar rel.                                      | x                                      | x                   | x                  | ~                                                |
| 0 ... 2,5 bar absolute                                  | x                                      | x                   | x                  | ~                                                |
| 0 ... 10 bar rel.                                       | x                                      | x                   | x                  | ~                                                |
| 0 ... 10 bar absolute                                   | x                                      | x                   | x                  | ~                                                |
| 0 ... 10 bar Differential pressure                      | x                                      | ~                   | ~                  | ~                                                |
| 0 ... 25 bar absolute                                   | x                                      | x                   | x                  | ~                                                |
| 0 ... 100 bar absolute                                  | x                                      | x                   | x                  | ~                                                |
| 100 mbar ... 14 bar rel. <sup>3)</sup>                  | x                                      | x                   | x <sup>4)</sup>    | ~                                                |
| 2,5 bar ... 200 bar absolute <sup>3)</sup>              | x                                      | x                   | x <sup>4)</sup>    | ~                                                |
| 100 mbar ... 35 bar Differential pressure <sup>3)</sup> | x                                      | ~                   | ~                  | ~                                                |
| 0 ... 200 bar – 0 ... 700 bar absolute <sup>3)</sup>    | x                                      | ~                   | ~                  | ~                                                |
| Negative pressure                                       | x                                      | ~                   | ~                  | ~                                                |

Process connection:  
G1/2 external thread,  
G1/8 internal thread

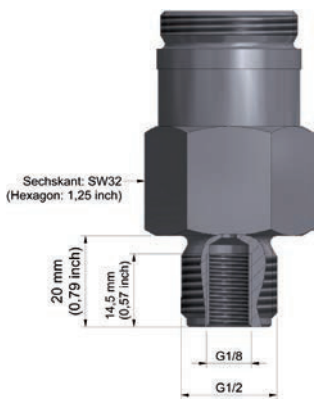


Figure 1: Pressure sensor

- 1) FS: full-scale value
- 2) Deviation < 5 mbar for ambient temperature change of 15 K according to DVGW G469:2010, test procedure C3
- 3) Customer-specific measuring range: freely selectable within these limits
- 4) On request

Temperature sensor

Media compatibility: All gases and liquids compatible with stainless steel 1.4301

Process connection: Probe sensor, 150 mm × 4.5 mm; thermowell 90 / 140 mm, G3/4 internal thread

| Measuring range                  | Type              | Threaded sensor | Cable sensor |
|----------------------------------|-------------------|-----------------|--------------|
| -10 °C ... +40 °C                | Probe sensor      | ~               | x            |
| -10 °C ... +40 °C                | Thermowell 90 mm  | x               | x            |
| -10 °C ... +40 °C                | Thermowell 140 mm | x               | x            |
| -30 °C ... +150 °C <sup>1)</sup> | Probe sensor      | ~               | x            |
| -30 °C ... +150 °C <sup>1)</sup> | Thermowell 90 mm  | x               | x            |
| -30 °C ... +150 °C <sup>1)</sup> | Thermowell 140 mm | x               | x            |
| Initial measuring accuracy       |                   | ±0,3 °C         |              |

- 1) Measuring range freely selectable within these limits

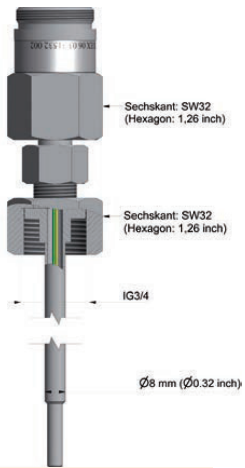


Figure 2: Thermowell

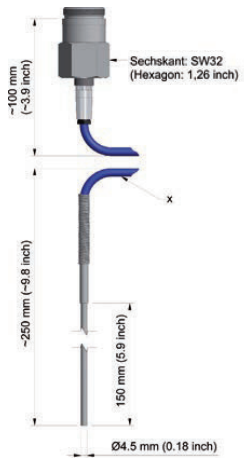


Figure 3: Probe sensor



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