

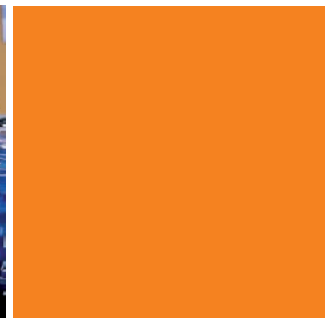
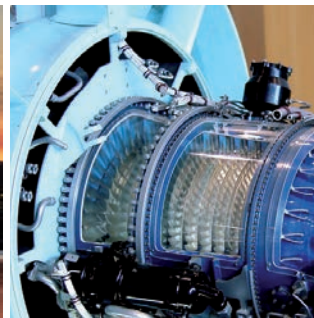


## Measured quantities

- Relative pressure
- Absolute pressure
- Differential pressure
- Barometer reading
- Temperature

## Applications

- Problem analysis in the gas network
- Monitoring in gas pressure control and measuring systems
- Pipe network calculation
- Leak test G469 / W400-2



# ESS3 R1

Data logger with one radial sensor

**ESS3 R1 overview**

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

**Battery-operated devices** have a modular design and comprise an operator control unit (housing, processor, software and display), sensor and battery in each case. The data loggers are approved for use in hazardous areas (Zones 1 and 2) and are designed in protection classes up to IP68 (water tight/immersible).

**The operator control unit** stores the measured values supplied by the pressure and temperature sensors in non-volatile memory. The current measured values are continuously indicated on a display. The data is transferred to the PC by means of a non-contact optical IrDA interface (USB connection).

**A lithium battery unit** enables multiple years of operation under ordinary conditions. The battery status is continually monitored and the remaining battery life is indicated.

**The TfsWin III software** is used to configure the logger (measuring cycle, measuring location, etc.) and to read out and graphically display the measured data. The communication for this takes place over the non-contact optical IrDA interface. Alternatively, keys can be used to operate the device.

**Sensor**

The sensor is the metrological link to the application. Performance and ease of use are therefore the central focus:

- A change of sensor by the user is possible and the new sensor is immediately ready for operation without calibration
- Stainless steel-enclosed, piezoresistive sensor with high long-term stability, resistant to corrosive media
- High resolution of measured values; multiple measuring ranges possible for one sensor
- Media temperature measurement
- High measuring rates through high self-resonant frequency
- High overpressure protection and high burst pressure
- Special designs, e.g., for O<sub>2</sub> measurement
- Appropriately-graduated fixed or customizable measuring ranges and various accuracy classes up to +/- 0.05 % of full scale
- Temperature sensors are available as rod-type sensors or are suitable for use in thermowells

**Technical data**

|                                      |  |
|--------------------------------------|--|
| Application                          | Measurement and storage of data (pressure and temperature) for fault analysis, monitoring of pipe network and gas pressure regulation systems                                  |
| Sensor connections                   | One radial sensor connection (M30) for accommodation of a pressure- or temperature sensor  |
| Explosion protection class           | Ex II 2G Ex ib IIC T4 Gb   |
| Protection classes, Housing          | Dependent on the sensor:<br>IP 67 with relative pressure<br>IP 68 with absolute- and differential pressure and temperature; W x H x D [mm]: 108 x 162 x 80<br>Weight [kg]: 1.2 |
| Measuring ranges of pressure sensors | Rel. press.: 0 ... 100/250 mbar a. 0 ... 1/2.5/10/25/100 bar;<br>Diff. press.: 0 ... 100 mbar a. 0 ... 1/10 bar<br>further measuring ranges on request                         |
| Measuring ranges of temp. sensors    | -10 °C ... +40 °C and -30 °C ... +150 °C   |
| Measuring rate                       | 125 msec ... 6 hours   |
| Meas. precision                      | Dependent on the sensor (up to 0.05 % of full scale)   |
| Resolution                           | up to 0.004 % of full scale  |
| Comm. interfaces                     | IrDA; Display; Keyboard  |
| Operating data                       | Battery operation up to 8 years  |
| Display                              | Actual value; maximum and minimum value as well as differential value;<br>Memory utilization and battery status  |
| Settings                             | Date and time; upper and lower alarm threshold; averaging (2 ... 600 values); resolution; measuring location name (29 characters); storage method (rolling / static)           |
| Operation                            | Via keyboard using menu<br>Via TfsWin III-software using IrDA-interface cable  |
| Storage                              | 250,000 date-time values / 512 kB  |
| Typical operating span               | 2 years<br>(through data compression)  |
| Software                             | TfsWin III for parameter assignment, display, analysis and archiving of data   |

Table 1: ESS3 R1 (Operator Control Unit)

**Pressure sensor**

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

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

| Measuring range   | Precision [% of FS <sup>1</sup> ] |                     |                    |   |
|---|-----------------------------------|---------------------|--------------------|---|
|   | Standard<br>± 0,4 %               | Premium<br>± 0,09 % | Select<br>± 0,05 % | Select plus<br>± 0,05 % < 5mbar <sup>2)</sup> |
| 0 ... 100 mbar relative                                 | X                                 | X                   | ~                  | ~   |
| 0 ... 100 mbar differential pressure                    | X                                 | ~                   | ~                  | ~   |
| 0 ... 250 mbar relative                                 | X                                 | X                   | ~                  | ~   |
| 0 ... 1 bar relative                                    | X                                 | X                   | X                  | ~   |
| 0 ... 1 bar differential pressure                       | X                                 | ~                   | ~                  | ~   |
| 0 ... 2.5 bar relative                                  | X                                 | X                   | X                  | ~   |
| 0 ... 2.5 bar absolute                                  | X                                 | X                   | X                  | ~   |
| 0 ... 10 bar relative                                   | X                                 | X                   | X                  | ~   |
| 0 ... 10 bar absolute                                   | X                                 | X                   | X                  | ~   |
| 0 ... 10 bar differential pressure                      | X                                 | ~                   | ~                  | ~   |
| 0 ... 25 bar absolute                                   | X                                 | X                   | X                  | X   |
| 0 ... 100 bar absolute                                  | X                                 | X                   | X                  | ~   |
| 100 mbar ... 14 bar relative <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 absolutet <sup>3)</sup>   | X                                 | ~                   | ~                  | ~   |
| Negative pressure                                       | X                                 | ~                   | ~                  | ~   |

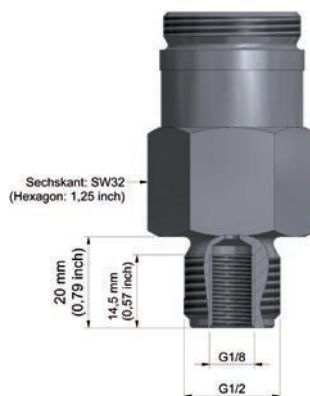


Figure 1: Pressure sensor

1) FS: of full scale  
 2) Difference < 5mbar at an ambient temperature change of 15 K, according to DVGW G469:2010 test method C3  
 3) customized measuring range; freely selectable within this range  
 4) on request

Table 2: Pressure sensors ESS3 R1

**Temperature sensor**

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

Rod-type sensor: 150 mm x 4.5 mm  
 Thermowell 90 / 140 mm: G3/4 internal thread

| Temperature sensor measuring range and type                | Screw-in sensor | Cable sensor |
|--|-----------------|--------------|
| -10 °C ... +40 °C   Rod sensor                             | ~               | X            |
| -10 °C ... +40 °C   Immersion sleeve 90 mm                 | X               | X            |
| -10 °C ... +40 °C   Immersion sleeve 140 mm                | X               | X            |
| -30 °C ... +150 °C <sup>1)</sup>   Rod sensor              | ~               | X            |
| -30 °C ... +150 °C <sup>1)</sup>   Immersion sleeve 90 mm  | X               | X            |
| -30 °C ... +150 °C <sup>1)</sup>   Immersion sleeve 140 mm | X               | X            |
| Measuring precision  | +/- 0,3 °C      |              |

1) freely selectable within this range

Table 3: Temperature sensor ESS3 R1

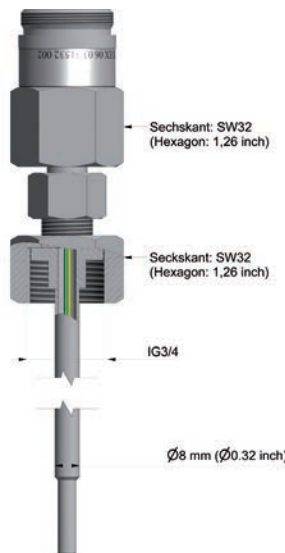


Figure 2: Temperature sensor, thermowell

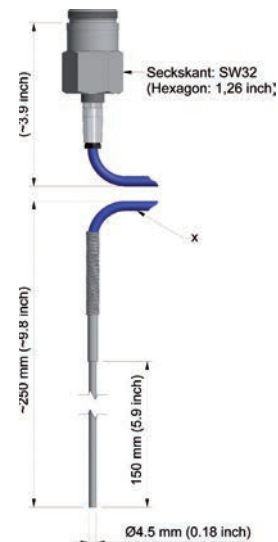


Figure 3: Temperature sensor, rod-type