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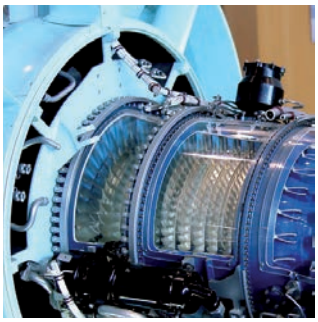
Measured quantities

- Relative pressure + temperature
- Absolute pressure + temperature
- Differential pressure + temperature

Applications

- Leak test of gas supply
  according to G469 B3 and C3
- Leak test of water supply
  according to W400-2
- Leak test for process industry



ESS3 R2

Data logger with one radial sensor and additional temperature sensor

ICS Schneider Messtechnik GmbH
Briesestraße 59
D-16562 Hohen Neuendorf / OT Bergfelde

Tel.: 03303 / 504066
Fax: 03303 / 504068

info@ics-schneider.de
www.ics-schneider.de

ESS3 R2 overview

The devices of the ESS3 R2 series are used for leak testing in pipeline construction. Besides the pressure measurement, recording of the pipeline temperature by a temperature sensor is also possible. The device determines the temperature-compensated test pressure independently and thus compensates for pressure fluctuations that occur because of the effect of temperature on the pipeline. These test results are therefore much more meaningful than pressure measurements alone.

Battery-operated devices have a modular design and can be subsequently furnished with a different measuring range by the user. Particular importance was attached to a robust design suitable for use at construction sites (protection classes up to IP 68 - watertight).

The operator control unit stores the measured values supplied by the pressure and temperature sensors in non-volatile memory for a large number of leak tests. The current measured values and changes since the start of the test are indicated on a display. After completion of the test, the measurement data is transferred to the USB connection of the PC by means of a non-contact optical IrDA interface.

A lithium battery unit enables multiple years of operation under ordinary conditions.

The TfsWin III software is used to graphically display and store the tests. The report is then created here.

Scope of functions

Application	used for mobile leak testing on gas lines (DVGW G469)
Display	Actual value Maximum and minimum value and differential value, memory utilisation and battery status
Settings	Measurement location number and name Time and date of measurement Maximum permissible pressure loss Minimum test pressure
Measuring rate	125 msec … 6 hours
Measu. precision	up to 0.05 % of full scale
Resolution	up to 0.004 % of full scale (< 1 mbar for measuring range 25 bar)
Operation	Via menu (via keyboard) Via TfsWin III software (via IrDA interface cable)
Storage	250,000 date-time values / 512 kB Typical range: approx. 50 pressure tests (thanks to data compression)
Software	TfsWin III for parameterisation, display, archiving of the data preparation of test reports on screen

Table 1: ESS3 R2 (scope of functions)

Sensor

The accuracy and resolution of the sensor determines the informative value of the test. Particular importance was attached to high stability of the measured pressure values under fluctuating ambient temperature conditions.

- Stainless steel-enclosed piezoresistive sensor with high long-term stability, suitable for liquid and gaseous media, resistant to corrosive media
- High resolution of measured values (typically 1 mbar for 25 bar measuring range); multiple measuring ranges are possible for one sensor.
- Effect of ambient temperature on the measured pressure values was eliminated by a fully automatic temperature compensation of the pressure measuring cell.
- High measuring rates through high self-resonant frequency
- High overpressure protection and high burst pressure
- Special designs, e.g., for O_2 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

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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[1]]			
	Standard ± 0,4 %	Premium ± 0,09 %	Select ± 0,05 %	Select plus ± 0,05 % < 5 mbar [2]
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 [3]	x	x	x [4]	~
2.5 bar ... 200 bar absolute [3]	x	x	x [4]	~
100 mbar ... 35 bar differential pressure[3]	x	~	~	~
0 ... 200 bar - 0 ... 700 bar absolutet [3]	x	~	~	~
Negative pressure	x	~	~	~

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 R2

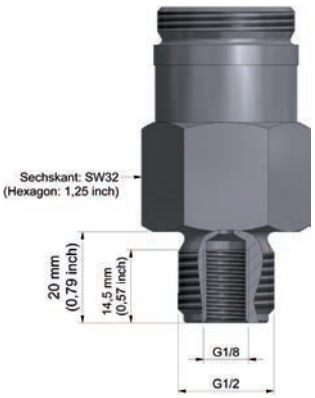

Figure 1: Pressure sensor

Temperature sensor

Rod-type sensor with 5 m cable and connecting plug.

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

Rod-type sensor: 150 mm x 4.5 mm

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[1]	Rod sensor	~	x
-30 °C ... +150 °C[1]	Immersion sleeve 90 mm	x	x
-30 °C ... +150 °C[1]	Immersion sleeve 140 mm	x	x
Measuring precision		+/- 0,3 °C	

1) freely selectable within this range

Table 3: Temperature sensor ESS3 R2

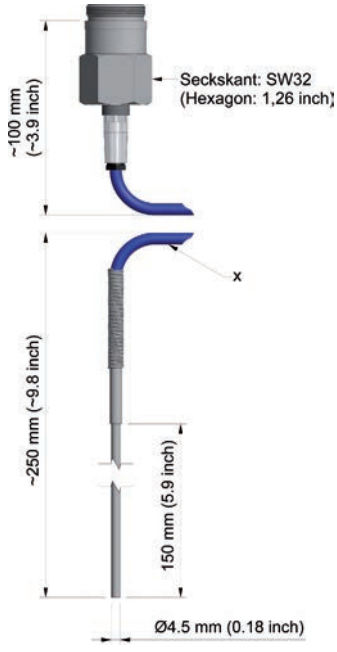

Figure 3: Temperature sensor, rod-type

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