

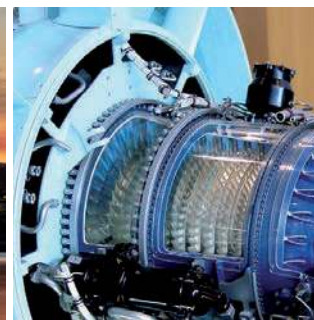


Measured values

- Absolute pressure + temperature
- Relative pressure + temperature

Applications

- Leak tests for gas supply in accordance with G469 B3 and C3
- Leak tests for water supply in accordance with W400-2 / EN 805
- Leak tests for process engineering / industry



DPK3 R2



Test kit for pressure tests with a radial sensor
and additional temperature sensor

DPK3 R2 overview

Pressure test kits of the series DPK3 R2 serve for leak tests in pipeline construction. Besides measuring pressure there is the option, to record the pipe temperature via a temperature sensor. The device determines independently the temperature-compensated test pressure and equalizes pressure variations that occur due to the pipelines temperature influence. Therefore these test results are more significant than merely pressure measurements

The battery-powered device is removable from the case and can be fitted directly on the pipe. So the test kit doesn't need to remain on site during prolonged leak tests. Attached importance was focused to robust and for sites suitable versions (protection classes ESS3 R2 to IP 68 – water proof).

The operating unit records in a non-volatile data-logger the provided measured values from the pressure or temperature sensor for a plurality of leak tests. A display shows the current measurement data, the present pressure loss and the result of the leak test. Upon completion of the test the measurement data are printed out directly on site with the battery-operated printer. So the protocol of the leak test is immediately available on the spot.

Via the software TfsWin III all in the data-logger stored test values can be transferred to the PC and provide information for the preparation of enlarged test reports.

Scope of functions

Application	used for mobile leak testing on gas lines (DVGW G469 / EN1610) used for mobile leak testing on water lines (DVGW W400-2 / EN805)
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	375 msec ... 6 hours
Meas. 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: DPK3 R2 scope of functions

Test kit DPK3 R2

Scope of supply	lockable plastic case ESS3 R2 Data Logger for pressure + temperature installed printer and replacement paper roll Power supply unit; IrDA interface cable TfsWin III PC software Connecting hose 2 m (Minimess) Adapter G1/2 to Minimess Operating manual
Protection classes	IP 54 (for Test kit) IP 67 (for Data Logger relative pressure) IP 68 (for Data Logger absolute pressure)
Ex-proof	Ex II 2G Ex ib IIC T4 Gb (for Data Logger)
Housing	W/H/T [mm]: 412/380/135
Weight	[kg]: ca. 4,2

Table 2: DPK3 R2 test kit

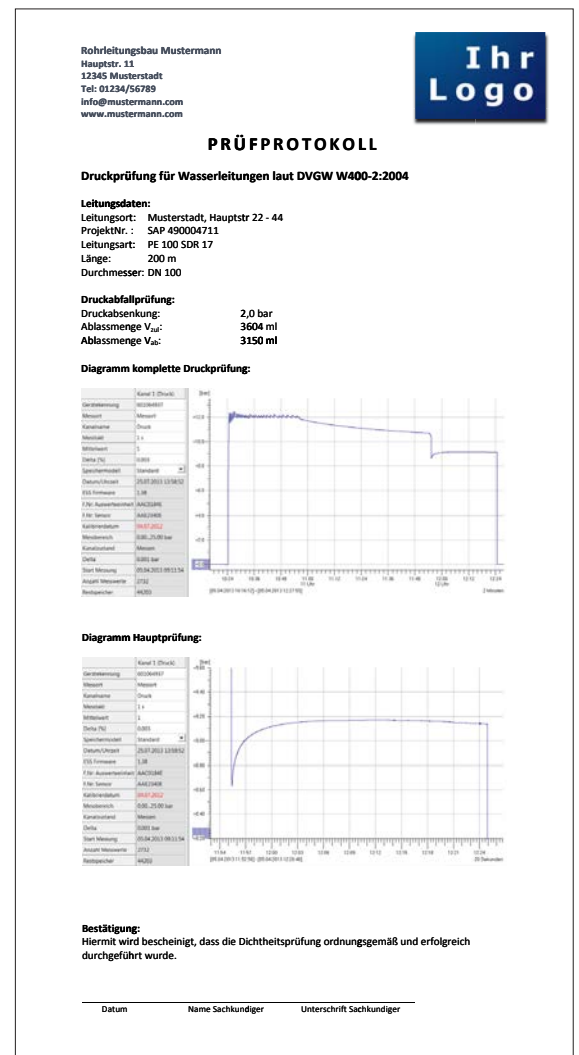


Figure 2: PC test report W400-2 (complete test and main analysis)

Sensors

The accuracy and resolution of the sensor determines the informative value of the test. Particular importance is attached to great stability of the pressure gauge values under conditions of ambient temperature variation.

Due to DVGW G469 C3 a stability of 5 mbar per 15 K ambient temperature variation is required.

- Steel-encapsulated, piezo-resistive sensor with high long-term stability, suitable for liquid and gaseous media and resistant to aggressive media.
- High resolution of measuring values (typical 1 mbar for a measuring range of 25 bar), various measuring ranges for one sensor possible.

- Eliminated influence of the ambient temperature on the pressure gauge values due to an all-automatic temperature compensation of the pressure measurement cell.
- High overpressure reliability and high burst pressure.
- Usefully graded fixed and customized determinable ranges of measurement and different classes of accuracy up to $\pm 0.05\%$ of full scale.
- Temperature sensors are available as rod-type or suitable for use in thermowells.

Pressure sensor

Measuring range	Precision [% of FS ¹⁾			
	Standard $\pm 0.4\%$	Premium $\pm 0.09\%$	Select $\pm 0.057\%$	Select plus $\pm 0.05\% < 5\text{ mbar}^{2)}$
0 ... 100 mbar relative	X	X	~	~
0 ... 250 mbar relative	X	X	~	~
0 ... 1 bar relative	X	X	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 ... 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⁾	~
0 ... 200 bar - 0 ... 700 bar absolute ³⁾	X	~	~	~
Negative pressure	X	~	~	~

Table 3: Pressure sensors DPK3 R2

Media compatibility: All gases and liquids that are compatible with stainless steel 1,4301 and seal material.

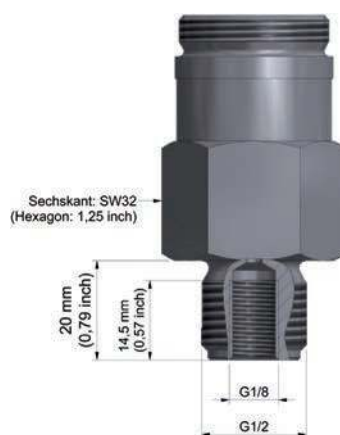


Figure 1: Pressure sensor

- 1) FS: of full scale
- 2) difference $< 5\text{ mbar}$ 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

Temperature sensor

Bulb sensor with 5 m cable and connecting plug.

Temperature sensor measuring range and type		Screw in sensor	Cabel sensor
-10 °C ... +40 °C	Rod sensor	~	X
-30 °C ... +150 °C ¹⁾	Rod sensor	~	X
Messgenauigkeit		+/- 0.3 °C	

1) freely selectable within this range

Table 4: Temperature sensors DPK3 R2

Media compatibility: All gases and liquids that are compatible with stainless steel 1,4301

Process connection:
Rod-type, 150mm x 4,5mm

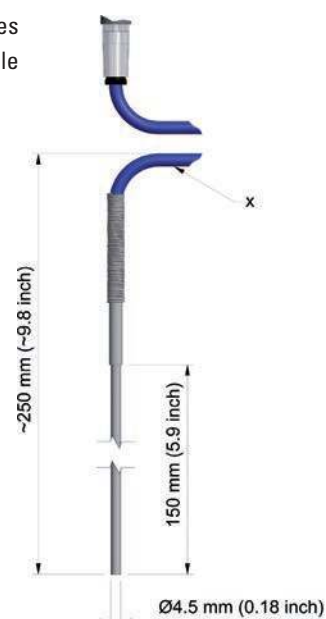


Bild 3: Temperature sensor bulb sensor



About UNION Instruments

UNION Instruments GmbH, founded in 1919, is a specialized supplier of measuring instruments in the areas of calorimetry and gas composition. Its user and customer base includes biogas producers, the chemical industry, and energy and water suppliers. The company has its headquarters in Karlsruhe and a subsidiary in Lübeck. With 30 international distributors, UNION Instruments operates worldwide. The company's core businesses include development and production as well as maintenance, service, and support.

Our service performance



Support

The **UNION-hotline** helps to solve all inquiries and urgent issues fast and easy. Device specific concerns can be solved worldwide within minutes by direct communication via TEAMVIEWER.



Original spare parts

Original spare parts for the majority of UNION's products are on stock directly at site and ready for dispatch within a few hours.



Software

For read-out of measurement and calibration data a device-specific software is available for our clients. In addition to the graphic display of measurement data its export in several database formats is possible.



Training

UNION offers individual in-house training or on-site seminars for installation, use and maintenance of our devices even at the customer's premises. Training is individually adapted to the client's requirements.



Repair service

A global service for inspection, maintenance and repair of our devices and systems is provided directly by UNION and via its distributors.



Certification

Since 20 years we have implemented the ISO9001 system. UNION's products are certified to ATEX and UL/CSA directives accordingly. Industrial safety "**Safety with System**" is part of UNION's company policy.



Engineering

In the last decades UNION compiled a very high level to the state of the art that covers many market segments. So a wide range of possible solution approaches is on-hand.



Calibration

As part of maintenance and service UNION provides the validation and re-calibration of measuring devices in conformity with certified custody transfer instruments and / or traceable perpendicular.

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