TetraTec® Instruments



LEAKAGE MEASUREMENT SYSTEM

CoM4.Leak-Compact

Leak testing against a leak-tight reference volume

TETRATEC INSTRUMENTS GMBH · STEINENBRONN · GERMANY

01 — THE METHOD

Two volumes, one differential pressure.

Filling warms the gas; afterwards it equalises with its surroundings. That equalisation lowers the pressure without a single molecule having escaped. A reliable leak test must separate these effects.

0.1 Pa/s
RESOLUTION OF PRESSURE DECAY
smallest measurable pressure decay

0.025 %
OF SPAN
linearity deviation of the pressure sensors

17025
DIN EN ISO/IEC
accredited, D-K-17589-01-00

THE ESSENTIALS

Differential pressure against a reference volume

The test specimen and the reference volume are brought to the same pressure, then the isolation valves close. What is measured is the pressure difference within the system.

Two control modes

Pressure control works either fast or precise and can be optimised at your pressure points. Fast repeat testing requires at least 500 mbar test pressure.

Self-test before the shift

With the test leaks, the system tests itself: its leak-tightness and the function of the test leaks. A leaking test system is thus noticed before it releases any parts.

Unknown parts recorded automatically

With the test leaks, the instrument determines the volume and leakage of an unknown test specimen by itself and optimises the cycle sequence from a curve set analysis.

FRONT PANEL: PORTS FOR TEST SPECIMEN AND TEST LEAKS



WHY A SECOND VOLUME

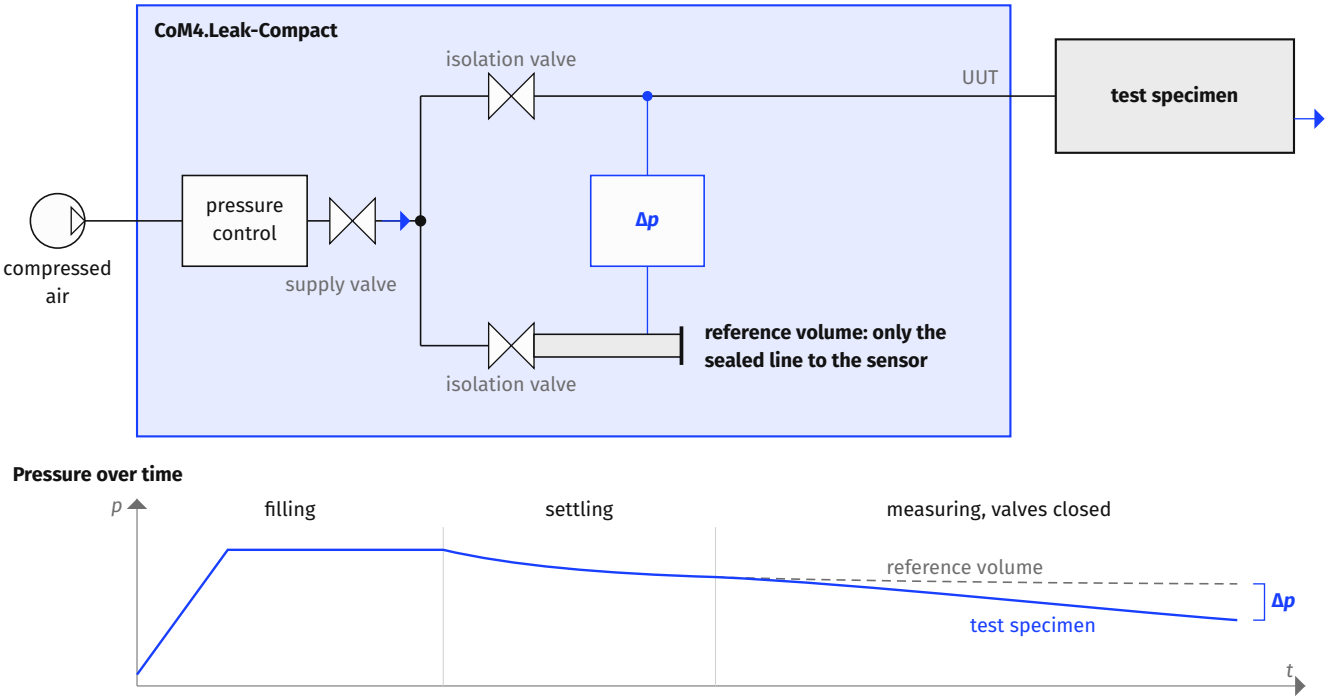
The obvious solution measures the pressure in the test specimen alone and converts its decay into a leakage rate. It needs a settling time until the thermal equalisation has died away, and that time is part of the cycle time. The reference volume cancels the thermal share out.

Operating principle

The test specimen and a leak-tight reference volume are filled together to the same test pressure. The supply then closes and the gas settles; the pressure still equalises between the two volumes. For measuring, the isolation valves close. The enclosed pressure falls in both – through leaks and through thermal effects.

What is measured is the rise of the differential pressure between the reference volume and the test specimen. The thermal share acts on both sides and does not enter the difference; what remains is the leakage. It becomes a quantitative leakage rate as soon as the volume of the test specimen is known – the instrument determines it on request. The CoM4.SYS controller runs the entire sequence.

TEST SEQUENCE



Idealised time curve illustrating the principle of the method; it does not show real measurement data.

TYPICAL APPLICATIONS

- Leak testing in series production
- Testing of housings, valves and threaded connections
- Incoming goods and sample inspection
- Volume determination of unknown test specimens
- Capability analysis of the measured value with repeat measurements
- Fault and leak tracing on the test adaptation

> *The thermal component cancels out – what the differential pressure shows is the leak.*

02 — DESIGN

The leakage limit first, then the volume.

VERSIONS

- Rack enclosure
- Rack enclosure with handles
- Desktop enclosure with feet and handles

Illustration: rack enclosure with handles.

ACCESSORIES

- Capillary test leaks for volume determination and the self-tests – strongly recommended, both functions require them
- 5 µm filter and oil/water separator for the compressed air supply

KEY SPECIFICATIONS

Resolution of pressure decay	**0.1 Pa/s**
Test pressure	**up to 6 bar gauge**
Absolute pressure	**0–7 bar abs.**
Differential pressure	**±20 mbar**
Test programs	**up to 95 type files**
Power supply	**100–240 V AC**
Controller	**CoM4.SYS**
Calibration certificates	**DAkkS, included**
Interfaces	**Ethernet (COMM, TetraTec Net-IO)**
Ambient temperature	**10–40 °C**
Enclosure	**19" 4 U**
Dimensions W × H × D	**450 × 190 × 550 mm**
Weight	**15 kg**

Complete data in the technical datasheet.

FROM ENQUIRY TO RECURRING CALIBRATION

1. **Record the measuring task**
   Measuring range, test volume, cycle time and operating conditions – the design follows from these.
2. **Design and calibrate the instrument**
   Assembly, calibration in our own accredited laboratory, calibration certificate with stated uncertainty.
3. **Integrate and support**
   Integration into your production, training and the recurring calibration at the agreed interval.

We will design the system for your leakage limit and your cycle time.

REQUEST A DESIGN

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