

T9000



Pneumatic deadweight testers

- Ranges up to 2000 mbar/700 inH₂O
- Accuracy from 0.015% of reading
- Ceramic nozzle and ball for enhanced performance
- Overpressure protection
- Rugged, durable case
- Traceable to International Standards



T9000

Pneumatic deadweight testers

The floating ball deadweight tester is a highly accurate primary pressure standard ideally suited for portable calibrations. Combining unique design features and ease of maintenance, these instruments are the solution for many applications including gas measurement.

Operating Principle

This instrument uses the fundamental pressure principle where:

$$P = \frac{F}{A}$$

Pressure (P) is defined as the product of the downward force (F) of the weights when applied to the effective area (A) of the ball within the nozzle. System pressure from the internal flow regulator (pressure supply) causes the ball to float within the nozzle. As it begins to lift within the tapered section of the nozzle, gas escapes past the ball and returns through the dynamic stabilisation regulator (pressure output). The gas flow past the ball self-centres it, ensuring that there is no contact between ball and nozzle.

When weights are added or removed from the ball, it falls or rises, affecting the gas flow. This change is sensed by the flow regulator, which alters the pressure to bring the system back into equilibrium.

Features

The T9000 tester benefits from the following special design features, ensuring best performance and minimum maintenance cost:

- Ceramic nozzle and ball enabling
 - Wide operating temperature range.
 - Enhanced cold-weather service.
 - Reduced temperature sensitivity (0.00048%/°C).
- 30 bar overpressure protection prevents internal damage.
- Stainless steel weight carrier for better stability.
- Mass set and weight carrier designed for convenient calibration steps.
- Stainless steel leveling screws for better durability.
- Exhaust vent discharges outside instrument case, reducing contamination.
- Durable case, allowing operation with the lid closed to eliminate the effects of draught.
- Ease of maintenance features
 - Pipeline liquid contamination can be removed on-site, avoiding costly returns and failed site calibrations.
 - Air tanks are accessible for cleaning.
- Rigid manifold connections prevent internal damage.
- Tripod mountable.



Standard models available

Model	Pressure Range
T9010/1 T9010/2	15 to 250 mbar 5 to 100 inH ₂ O
T9020/1 T9020/2	15 to 500 mbar 5 to 250 inH ₂ O
T9030/1 T9030/2	15 to 1000 mbar 5 to 400 inH ₂ O
T9040/1 T9040/2	15 to 2000 mbar 5 to 700 inH ₂ O

Intermediate ranges are available.

Accuracy

Three accuracy classes are available.

0.050% of reading

0.025% of reading

0.015% of reading

Low pressure, high pressure option (Option L)

All the above models can be supplied with a 10 mbar/3 inH₂O starting pressure and 1 mbar/0.5 inH₂O fine increment weights.

inH₂O pressure unit

The T9000 can be supplied in any of the three standard water density factors.

inH₂O at 4°C - ISO

inH₂O at 60°F - AGA

inH₂O at 20°C - ISA

If unspecified, the instrument will be manufactured for inH₂O at 20°C.

Gravity

The T9000 can be manufactured to either user-defined local gravity or International Standard gravity. If unspecified, the instrument will be manufactured to 980.665 cm/s² (International Standard).

Specifications

GENERAL

Accuracy

0.05%, 0.025%, 0.015% of reading traceable to NPL, UK and NIST, USA including linearity, hysteresis, repeatability, and the reference standard

Temperature

Reference: 23°C

Temperature coefficient: 0.00048% of reading/°C

Operating range: 0 to 35°C

Gravity

As specified on order. If unspecified, then International Standard: 980.665 cm/s².

Instrument weight

7 kg to 12 kg

Instrument dimensions

36 x 26 x 15 cm (L x D x H)

STARTING PRESSURE

Standard: 15 mbar, 5 inH₂O

Optional: 10 mbar, 3 inH₂O

MINIMUM WEIGHT INCREMENT

Standard: 5 mbar, 5 inH₂O

Optional: 1 mbar, 0.5 inH₂O

GAS SUPPLY

Pressure

2.5 bar minimum, 7 bar maximum

Quality

ISA S7.3

Flow Rate

0.5-6 SCFH

MATERIALS OF CONSTRUCTION

Weight material

Series 3 non-magnetic, austenitic stainless steel

Ball material

ceramic

Nozzle material

ceramic

CONNECTION PORTS

Inlet: 1/4-inch NPTF

Outlet: 1/4-inch NPTF

Other products and services

Deadweight testers

A full range of primary standards for pressure from -1 to 4000 bar, also absolute and differential pressure models.

Comparison pumps

Used to check pressure measuring instruments against master test gauges or digital indicators.

Due to Pressurements' process of continuous improvement, specifications are subject to change without notice.



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