

E-DWT-H

Deadweight Tester - electronic



- **Designed to replace mechanical, piston cylinder and weight based deadweight testers**
- **Deadweight tester performance with digital measurement convenience**
- **Pressure range: from 0 - 7 MPa to 200 MPa (0 - 1000 psi to 30000 psi)**
- **Uncertainty: $\pm 0.02\%$ of reading**
from 10% to 100% of range, if 1 Sensor (Q-RPT) is built-in
from 1% to 100% of range, if 2 Sensors (Q-RPT) are built-in
- **Separate fine adjustment tool for maximum superfine control resolution**
- **No piston-cylinder changes, switch QRPT ranges in seconds**

By DAkkS accredited laboratory according to DIN EN ISO / IEC 17025: 2018. The accreditation is valid only for the quantities listed in the accreditation scope. (Our Laboratory number is D-K-15055-01-00).

Specifications

Power Requirements

to RPM4-E-DWT: 12 V dc 1.2 A
to AC to DC power supply: 100 V ac to 240 V ac, 50/60 Hz

Temperature Range

Storage: -20 °C to 70 °C
Operating: 10 °C to 40 °C

Relative Humidity

Storage: 0 % to 100 %
Operating: 0 % to 70 %

Weight

with 1 Q-RPT: 12 kg approximate
with 2 Q-RPT: 14 kg approximate

Dimensions

E-DWT footprint (W x D): 41.4 cm x 37.1 cm
E-DWT height: 26.9 cm, 33.6 cm to max. var. volume handle height

Pressure Ranges:

(dependant on Q-RPT(s) included in RPM4-E-DWT) 200 MPa maximum with standard variable volume
100 MPa maximum with high volume (-HV)
variable volume

Operating medium:

Delivered filled with oil (di-ethyl-hexyl sebacate) or dry

Reservoir capacity:

300 cm³

Variable volume displacement

Standard: 3 cm³, 200 MPa (30000 psi) maximum
High: 7 cm³, 100 MPa (15000 psi) maximum

Filling and priming pump displacement:

3,7 cm³

Test pressure connection:

DH500 female

Note: DH500 is a gland and collar type fitting for 6mm (¼ in.) coned and left hand threaded tubes
Equivalent to AE F250C, HIP HF4, 9/16-18 UNF, etc.

Pressure limits

Maximum working pressure: 200 MPA (30000 psi) with standard variable volume
(Range of RPM4-E-DWT monitor's Hi Q-RPT) 100 MPa (15000 psi) with high volume variable volume
Maximum priming pump pressure: 700 kPa (100 psi)
Maximum working pressure with Lo Q-RPT selected:
Range of RPM4-E-DWT monitor's Lo Q-RPT

Communication ports:

RS232 (COM1,COM2)

Warm up time:

15 minutes temperature stabilization
Recommended from cold power up

Resolution

Default: 0.01 % of active range
Use adjustable to 1 ppm of Q-RPT maximum or 10 ppm of active AutoRange, whichever is larger

Precision:

± 0.018% of reading or 0.0018 of Q-RPT span

One year stability:

± 0.0075 % of reading

Measurement uncertainty:

± 0.02 % of reading or 0.002 % Q-RPT span

E-DWT-H in lab environment

AutoTest™ lets E-DWT operators quickly define test points and adjust all of the range-dependent settings with a single function.

The resolution and stability test used by the RPM4-E-DWT are set according to the range of the device under test. The upper limit setting is also set and provides range-based warnings and overpressure protection. While running AutoTests, the operator is prompted to set each sequential test point and test data is stored in the RPM4-E-DWT for recall or download. Typical test setup is quick and easy, but more complex tests can also be stored and reused.

Broad workload coverage

The E-DWT-H has the operational versatility to calibrate and test a broad range of pressure measuring instruments including:

- Analog gauges
- Transducers
- Calibrators
- Sensors
- Transmitters

A modern alternative to the traditional deadweight tester

E-DWT-H breaks new ground, improving the hydraulic pressure calibration process. E-DWT-H is an electronic calibrator designed to replace mechanical, piston-cylinder and weight based deadweight testers. It's a lighter weight, easier-to-use deadweight tester alternative that is at home in the lab or instrument shop, as well as in the field performing in-situ calibrations and tests.

This complete hydraulic pressure calibration system combines the convenience and precision of continuous, real time electronic pressure measurement with the simple and direct operation of high quality operator controlled pressure generation hardware.

E-DWT-H one year measurement uncertainty is ± 0.02 % of reading with ranges up to 200MPa (30000 psi). It can be configured to provide this uncertainty from its full scale down to 1 % of its range. Built-in pressure generation and control hardware allow the operator to fill and prime the system under test and generate and precisely adjust pressure throughout the range with ease.

Deadweight tester performance with digital measurement convenience

E-DWT-H offers precision, low measurement uncertainty and the stability over time of a conventional deadweight tester without the inconveniences associated with the piston-cylinders, weights, hand pumps, and interconnecting plumbing.

- No weights to load and unload or regularly send out for calibration
- No need to know and correct for local gravity or ambient temperature
- No piston-cylinder changes; switch Q-RPT ranges in seconds
- Not sensitive to level or vibration
- Able to set and read any pressure value exactly, no minimum increment limited by smallest available masses
- Operates in any unit of measure while deadweight tester is typically limited to the pressure unit stamped on the mass
- Perfect for applications that require setting a nominal pressure precisely on the device under test and measuring it, such as analog gauge calibration
- On-board, AutoTest calibration routines and data acquisition
- Interfaceable with a PC or laptop to allow for automated data acquisition
- Easily recalibrated without crossfloating. Automated calibration of E-DWT-H is possible using COMPASS® for Pressure software.

Versatility to cover a broad workload in a variety of environments

The E-DWT-H is at home in metrology and calibration labs, on the production floor or in the field. It operates with Sebacate calibration fluid, mineral oil, Skydrol® and other liquids. An optional battery/charger pack supports up to eight hours of operation away from line power.

Features

Reference Pressure Monitor and Q-RPT quartz reference pressure transducers

The E-DWT's electronic reference pressure monitor is a dedicated version of DHI's RPM4, designated RPM4-E-DWT. RPM4-E-DWT can be configured with one or two high precision quartz reference pressure transducers (Q-RPTs) with ranges from 7 MPa (1,000 psi) to 200 MPa (30,000 psi).

E-DWT's outstanding pressure measurement specifications are made possible by DHI's exclusive quartz reference pressure transducer (Q-RPT) modules.

Q-RPTs measure pressure by measuring the change in the natural oscillating frequency of a quartz crystal with pressure induced stress. To be qualified for use in a Q-RPT module, each transducer is individually evaluated and characterized using automated primary pressure standards. Only transducers exhibiting superior levels of linearity, repeatability and stability are selected. A proprietary compensation model, derived from 20+ years experience with thousands of quartz pressure transducers, is applied to optimize the metrological characteristics.

Q-RPT module advantages

In addition to outstanding metrological characteristics, Q-RPT modules offer the advantages of:

- Negligible warm-up time
- Quartz element isolated from test medium
- Minimal sensitivity to orientation

Accuracy and performance

- Uncertainty: $\pm 0.02\%$ of reading
from 10% to 100% of range, if 1 Sensor (Q-RPT) is built-in
from 1% to 100% of range, if 2 Sensors (Q-RPT) are built-in
- Low torque variable volume allows for pressure generation up to 200 MPa (30,000 psi) with minimal physical effort
- Separate fine adjustment tool for maximum, superfine control resolution
- User defined resolution and ready limits enable user to optimize performance based on DUT specifications
- High pressure isolation valve and pressure relief valve protect the low pressure reference transducer from over pressure when high pressure reference transducer is active
- Ease of use
- AutoRange feature optimizes measurement and safety features for the specific range of the instrument being calibrated
- Simple rezeroing while vented at atmospheric pressure
- Simple, objective pressure "ready/not ready" indicator with user adjustable criteria to ensure repeatable results among operators
- Not dependent on local gravity or ambient temperature
- Sets and reads any pressure value directly in any unit of measure, without moving weights
- Built-in priming system to fill system with test fluid and purge unwanted air to assure smooth operation
- Optional foot switch accessory allows hands-free data collection when running AutoTests

Portability

- Rechargeable battery pack option for eight hours of field operation
- Everything to set, adjust and read pressure in one compact, transportable package
- Optional shipping/carrying case with handles and wheels allows for easy transport to field application
- Proven rugged and weatherproof design with room for accessories.

Automation

RS232 interface allows for real time automated data collection and customized report generation using DHI's COMPASS® for Pressure calibration software

Free upgrades

Flash memory for simple and free embedded software upgrades from www.dhstruments.com

Automation and support

Automate data collection and manage calibration assets with COMPASS® for Pressure software

E-DWT can run stand-alone tests and collect test data. Test data can be downloaded over the RPM4-E-DWT's RS232 interface.

The RPM4-E-DWT's RS232 interface can also be used to run the E-DWT with COMPASS® for Pressure software or user developed software.

COMPASS® for Pressure software is universal pressure calibration software for the laboratory, which can be used to run simple or complex tests with multiple instruments. The user can create his/her own calibration report, and data can be exported to Fluke MET/CAL® Plus Calibration Management Software.

E-DWT-H in the field

E-DWT-H has been designed for ease of use in the field performing in-situ calibrations and tests. The optional rugged, wheeled case allows quick setup and makes transport easy and worry free. With the battery pack option, eight hours of field application is possible. No need to drain fluid or disassemble hardware for transport. Simply remove from case connect to test item.