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Calibration

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E-DWT-H Electronic Deadweight Tester

Highlights

A modern alternative to traditional dead weight tester calibration

E-DWT-H breaks new ground in dead weight tester calibration, 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, easier-to-use deadweight tester calibration 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, realtime 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 30,000 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.

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

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.

Deadweight tester calibration 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.

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.

- 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
- Two year calibration interval supported at measurement uncertainty of $\pm 0.025\%$ of reading.
- Easily recalibrated without crossfloating. Automated calibration of E-DWT-H is possible using COMPASS® for Pressure software.

Description

All the features you expect in a modern state-of-the-art electronic dwt, including:

Accuracy and performance

- One-year measurement uncertainty is $\pm 0.02\%$ of reading from 10% to 100% with one Q-RPT, and from 1% to 100% with two Q-RPTs
- 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

Automation

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

E-DWT can run stand-alone tests and collect test data for dead weight tester calibration. 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.

The support you need, when you need it

Fluke’s calibration, testing and repair services are dedicated to satisfying your needs quickly and at a fair cost while maintaining the unmatched level of quality that is our trademark.

Fluke’s calibration laboratories are accredited by the American Association for Laboratory Accreditation (A2LA) for conformance to ISO Guide 17025.

Fluke Calibration has access to global calibration and repair facilities to keep your dead weight tester and other hardware in top working order.

If you need training for yourself or your staff, Fluke Calibration offers a broad range of classes including: the principles and practices of pressure calibration, advanced pressure metrology, gas flow calibration using a molbloc/molbox system, setup and operation of COMPASS® for Pressure calibration software, and other electrical, temperature and RF calibration topics.

The Fluke Calibration commitment to support provides additional benefits as well, including invitations to software user group meetings and conferences, periodic email bulletins and a Fluke Calibration newsletter.

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

Free upgrades

Flash memory for simple and free embedded software upgrades from [Fluke Calibration](#).

- 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.

Specifications

General	
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	
1 Q-RPT:	12 kg (26 lb) approximate
2 Q-RPT:	14 kg (30 lb) approximate
Dimensions	
E-DWT footprint:	41.4 cm W x 37.1 cm D (16.3 in x 14.6 in)
E-DWT height:	26.9 cm (10.6 in), 33.6 cm (13.2 in) to max variable volume handle height
Pressure ranges dependent on	200 MPa (30,000 psi) maximum with standard variable volume 100 MPa (15,000 psi) maximum with high volume (-HV) variable volume

Q-RPT(s) included in RPM4-E-DWT.	
Operating medium	Delivered filled with oil (di-ethyl-hexyl sebacate) or dry <i>Standard E-DWT-H compatible with Sebacate, silicon oils, propylene glycol, fully fluorinated liquids, partially fluorinated liquids, isopropyl alcohol, and distilled water. Option for Skydrol or mineral oil preparation.</i>
Reservoir capacity	300 cc (18 in3)
Variable volume displacement	
Standard:	3 cc (0.18 in3), 200 MPa (30,000 psi) maximum
High:	7 cc (0.43 in3), 100 MPa (15,000 psi) maximum
Filling and priming pump displacement	3.7 cc (0.23 in3)
TEST pressure connection	DH500 female. Note: DH500 is a gland and collar type fitting for 6mm (1/4 in) coned and left hand threaded tubes equivalent to AE F250C, HIP HF4, 9/16-18 UNF, etc...
Pressure Limits	
Maximum Working Pressure:	Range of RPM4-E-DWT monitor's Hi Q-RPT 200 MPa (30,000 psi) with standard variable volume. 100 MPa (15,000 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)

Pressure measurement

Warm up time	15 minute temperature stabilization recommended from cold power up.
Normal Operating Temperature Range	10 °C to 40 °C
Resolution	Default: 0.01 % of active range User adjustable to 1 ppm of Q-RPT maximum or 10 ppm of active AutoRange, whichever is larger
Precision¹	± 0.018 % of reading or 0.0018 % of Q-RPT span, whichever is greater

Predicted Stability²	
One year:	± 0.0075 % of reading
Two year:	± 0.015 % of reading
Measurement Uncertainty³	
One year:	± 0.02 % of reading or 0.002 % of Q-RPT span, whichever is greater
Two year:	± 0.025 % of reading or 0.0025 % of Q-RPT span, whichever is greater

1. Combined linearity, hysteresis, and repeatability. Precision does not include stability or calibration reference uncertainty.
2. Predicted Q-RPT measurement stability limit (k=2) assuming regular use of AutoZero function and short term stability between rezeroing.
3. Maximum deviation of the Q-RPT indication from the true value of applied pressure including precision, predicted stability with rezeroing, temperature effect from 10 °C to 40 °C and calibration uncertainty (assumes calibration reference uncertainty of ± 0.005 % of reading, k=2), combined and expanded (k=2) following the ISO "Guide to the Expression of Uncertainty in Measurement.

Models and Accessories

Model Name	Description

Model Name	Description
E-DWT-HV AhhhM/AIIIM	<p>E-DWT hydraulically operated electronic deadweight tester Download the product brochure for configuration details.</p> <p>Where: E-DWT-H: Hydraulically operated electronic deadweight tester (E-DWT) HV: High volume variable volume if desired (limits max pressure to 100 MPa). Do not include if high volume variable volume is not desired. AhhhM: Hi Q-RPT designator AllIM: Lo Q-RPT designator. Do not include if Lo Q-RPT is not desired.</p> <p>Configure E-DWT-H as follows:</p> <ol style="list-style-type: none"> 1. Determine the maximum pressure desired and select the Hi Q-RPT from the E-DWT-H Q-RPTs chart. 2. If uncertainty better than ± 0.02 % reading is needed below 10 % of the span of the Hi Q-RPT, add a Lo Q-RPT from the E-DWT-H Q-RPTs chart. Lo Q-RPT cannot be higher than A40M. 3. If desired, specify the high volume variable volume rather than the standard volume variable volume (limits maximum pressure to 100 MPa). 4. Standard preparation for unit is filled with Sebacate oil calibration fluid. See specifications for compatibility with other liquids. If other preparation is needed, must specify either “Shipped Dry, Std Prep, “Shipped Dry, Skydrol Ready, or “Shipped Dry, Mineral Oil Ready. The fill kit accessory is recommended for units that are shipped dry and for refilling in the field.

Accessories common to all models:

Accessory	Description
Case	Rugged, wheeled, reusable molded shipping case (part #3329777)
A100M	<p>Available as Hi Q-RPT only. Lo Q-RPT must be A40M or lower.</p> <p>SI Version Maximum Range [MPa] Gauge 100 US Version Maximum Range [psi] Gauge 15,000</p>

Accessory	Description
A10M	SI Version Maximum Range [MPa] Gauge 10 US Version Maximum Range [psi] Gauge 1,500
A140M Hi Q-RPT	Available as Hi Q-RPT only. Lo Q-RPT must be A40M or lower SI Version Maximum Range [MPa] Gauge 140 US Version Maximum Range [psi] Gauge 20,000
A14M	SI Version Maximum Range [MPa] Gauge 14 US Version Maximum Range [psi] Gauge 2,000
A200M Hi Q-RPT	Available as Hi Q-RPT only. Lo Q-RPT must be A40M or lower. SI Version Maximum Range [MPa] Gauge 200 US Version Maximum Range [psi] Gauge 30,000
A20M	SI Version Maximum Range [MPa] Gauge 20 US Version Maximum Range [psi] Gauge 3,000
A40M	SI Version Maximum Range [MPa] Gauge 40 US Version Maximum Range [psi] Gauge 6,000
A70M Hi Q-RPT	Available as Hi Q-RPT only. Lo Q-RPT must be A40M or lower SI Version Maximum Range [MPa] Gauge 70 US Version Maximum Range [psi] Gauge 10,000

Accessory	Description
A7M	SI Version Maximum Range [MPa] Gauge 7 US Version Maximum Range [psi] Gauge 1,000
Interconnect kit	Connect E-DWT rear test port to test devices (part #3466377)
E-DWT liquid fill kit	To fill E-DWT delivered dry or to refill E-DWT that has drawn in air (part #3462475)
BSP adaptor kit	Adaptors to 1/8, 1/4, 3/8, 1/2 BSP (PART #3466419)
NPT adaptor kit	Adaptors to 1/8, 1/4, 1/2 NPTF (part #3466392)
Priority Gold Instrument CarePlan	Fluke Calibration Priority Gold Instrument CarePlans are available for most calibration products. Please contact your local Fluke Calibration sales representative for details or to request a quote. You may also call the Customer Care Center at 877-355-3225 or send email to careplans@flukecal.com .
Silver CarePlan	Fluke Calibration Silver CarePlans are available for most calibration products. Please contact your local Fluke Calibration sales representative for details or to request a quote. You may also call the Customer Care Center at 877-355-3225 or send email to careplans@flukecal.com .

Knowledge_and_information

Product Manuals
 E-DWT Instruction Sheet (1.09 MB)
 E-DWT Power Supply Replacement Kit Instruction Sheet (2.15 MB)

Product Manuals

 [E-DWT-10000-AF Operation and Maintenance Manual \(3.09 MB\)](#)

 [E-DWT-H Operation and Maintenance \(5.53 MB\)](#)

 [E-DWT-H Operation and Maintenance Supplement \(81.81 KB\)](#)

 [E-DWT-H Operation and Maintenance Russian \(2.55 MB\)](#)

 [E-DWT-H Operation and Maintenance French \(2.06 MB\)](#)

 [E-DWT-H User Guide \(485.3 KB\)](#)

Brochures

 [E-DWT Electronic Deadweight Tester Brochure \(1.39 MB\)](#)

 [Petrochemical industry calibration solutions \(2.59 MB\)](#)

 [Решения по калибровке для нефтехимической промышленности \(Russian\) \(2.97 MB\)](#)

 [Soluciones de calibración de la industria petroquímica \(Spanish\) \(2.9 MB\)](#)

 [Soluções de calibração do setor petroquímico \(Portuguese\) \(2.91 MB\)](#)

 [Kalibrierlösungen für die petrochemische Industrie \(German\) \(2.39 MB\)](#)

 [Solutions d'étalonnage pour l'industrie pétrochimique \(French\) \(2.38 MB\)](#)

 [石油化学産業における校正ソリューション \(3.2 MB\)](#)

 [Pharmaceutical industry calibration solutions \(2.28 MB\)](#)

 [Решения по калибровке для фармацевтической промышленности \(Russian\) \(3.62 MB\)](#)


Brochures

-  [Soluciones de calibración para la industria farmacéutica \(Spanish\) \(4.57 MB\)](#)
-  [Solutions d'étalonnage pour le secteur pharmaceutique \(French\) \(5.52 MB\)](#)
-  [Kalibrierlösungen für die Pharmaindustrie \(German\) \(5.6 MB\)](#)
-  [Soluções de calibração do setor farmacêutico \(Portuguese\) \(3.54 MB\)](#)
-  [医薬品産業における校正ソリューション \(3.75 MB\)](#)
-  [Power and utilities industry calibration solutions \(5.03 MB\)](#)
-  [Soluciones de calibración de la industria de energía y servicios \(Spanish\) \(6.52 MB\)](#)
-  [Решения в области калибровки приборов для измерения при производстве электроэнергии и эксплуатации инженерно-технических систем \(6.98 MB\)](#)
-  [Soluções de calibração do setor de serviços públicos e energia \(Portuguese\) \(6.97 MB\)](#)
-  [Kalibrierungslösungen für die Energie- und Versorgungsindustrie \(German\) \(5.91 MB\)](#)
-  [Solutions d'étalonnage pour le secteur de la distribution d'énergie \(French\) \(5.9 MB\)](#)
-  [電力産業における校正ソリューション \(6.68 MB\)](#)

General Calibration / Metrology Topics

-  [E-DWT Power Supply Replacement Kit Instruction Sheet \(4.7 MB\)](#)

Application Notes

-  [Guide to Determining Pressure Measurement Uncertainty for Q-RPT Based Products \(1.35 MB\)](#)
-  [Process Calibration Tools: Pressure Applications \(1.12 MB\)](#)

Application Notes

 [The Electronic Deadweight Tester: A Modern Replacement for the Conventional Deadweight Tester \(1.2 MB\)](#)

Data Sheets

 [6531 and 6532 E-DWT Electronic Deadweight Tester Kits Technical Data \(1.59 MB\)](#)

 [E-DWT-10000-AF™ Electronic Deadweight Tester Data Sheet \(1.61 MB\)](#)

Firmware

[RPM4-E-DWT A70M/A7M-AF Embedded Software](#)

Papers / Articles

 [The Electronic Deadweight Tester -- A Modern Replacement for the Conventional Deadweight Tester \(1.02 MB\)](#)

 [The Electronic Deadweight Tester — A Modern Replacement for the Conventional Deadweight Tester \(4.05 MB\)](#)

Video

[E-DWT-H & 6531/6532 Electronic Deadweight Tester Video Series](#)

On-Demand Webinars

[Pressure Series, Part 1 of 3 - Introduction to Pressure Calibration](#)

Press Releases

[DHI's New E-DWT-H™ Electronic Deadweight Tester Combines Pressure Generation, Control and Digital Measurement in a Portable, Rugged and Lightweight Package](#)

Product Images





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- [2] <https://eu.flukecal.com/literature/articles-and-education/pressure-calibration/video/e-dwt-h-video-series>
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