TECHNICAL DATA

Fluke Calibration 6531, 6532 E-DWT Electronic Deadweight Tester Kits

Key features

A powerful, complete hydraulic pressure calibration system to cover a wide workload

Fluke Calibration improved the hydraulic pressure calibration process with the introduction of E-DWT-H electronic deadweight tester. E-DWT-H is an electronic calibrator designed to deliver traditional hydraulic deadweight tester performance with digital measurement features and convenience. Some improvements offered by E-DWT-H include:

- No weights to load and unload, transport or send out for calibration
- Provides real-time pressure indication with no need to know and correct for local gravity or ambient temperature
- No piston-cylinder changes
- No significant sensitivity to level or vibration
- Able to set and read any pressure value exactly, no minimum increment limited by smallest available masses; perfect for applications that require setting a nominal pressure precisely on the device under test and measuring it, such as analog gauge calibration
- Operates in any unit of measure, switching easily from one unit to the next

The E-DWT-H is at home in metrology and calibration labs, on the production floor or in the field. It can operate with a wide selection of test mediums, including Sebacate calibration fluid, mineral oil, water and other liquids. ± 0.02 % of reading total one-year measurement uncertainty rivals the best laboratory deadweight testers.

Product overview: Fluke Calibration 6531, 6532 E-DWT Electronic Deadweight Tester Kits

The E-DWT-H is used in the lab or instrument shop or can be taken into the field for performing in-situ calibrations and tests. This hydraulic pressure calibration system combines a high performance electronic reference pressure monitor and manually operated pressure generation and control hardware in a single, compact and rugged package. E-DWT-H offers the ease of use and precision of continuous, real time electronic pressure measurement with the simple and direct pressure control of high quality manual pressure hardware. E-DWT is named “electronic deadweight tester” because it is intended as a lightweight and easy to use, modern alternative to conventional piston-cylinder and weight based deadweight testers.

The E-DWT’s electronic reference pressure monitor is a special version of 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).

The RPM4-E-DWT is controlled locally by the operator using its front panel display, keypad and optional foot pedal or remotely by a computer using ASCII character command strings over its RS-232 interface.

RPM4-E-DWT uses an AutoRange feature to automatically select the most appropriate Q-RPT and to optimize the E-DWT-H setup to cover the desired range of operation. When two Q-RPTs are included, a half-turn valve isolates and protects the Lo Q-RPT from high pressure when the Hi Q-RPT is in use. Visual and audible indicators assist the operator in setting the shut off valve correctly.

The E-DWT-H includes the hardware necessary to fill and prime the system under test and generate and precisely adjust pressure up to 200 MPa (30 000 psi).

The E-DWT-H can be powered with an optional battery/charger pack for use in locations where AC power is not readily available.

High performance calibration made simple

Fluke Calibration electronic deadweight tester kits feature E-DWT-H configurations combined with the accessories needed for a complete calibration system. Model 6531 options feature E-DWT-H configurations with a single quartz reference pressure transducer (Q-RPT) to offer percent of reading performance from 10 % to 100 % of device full scale. Model 6532 options feature an additional Q-RPT to maximize workload coverage, with percent of reading performance from 1 % to 100 % of device full scale. An included vacuum fill kit allows the E-DWT to be filled with your choice of compatible fluid, while eliminating problematic air pockets from the test circuit. Also included is a test station adapter to mount just about any pressure device to be tested without using PTFE tape or wrenches. 6531 and 6532 kits provide all you need to perform high level hydraulic pressure calibration right out of the box.

- Pressure ranges available to 200 MPa (30,000 psi)
- ± 0.02 % of reading total one-year accuracy, 0.025 % for two years
- Low torque variable volume allows for pressure generation and control up to 200 MPa (30,000 psi) with minimal physical effort
- Built-in priming system to fill system with test fluid and purge unwanted air to assure smooth operation
- Unique test port design eliminates the need for PTFE tape or wrenches. Adapters included for 1/8 in, 1/4 in, 3/8 in and 1/2 in NPT, 1/8 in, 1/4 in, 3/8 in and 1/2 in BSP, M20 x 1.5 and M14 x 1.5
- Compatible with a wide range of liquids, including water. Vacuum fill kit included to fill the E-DWT with any compatible test medium
- AutoTest™, AutoRange, ready/not ready indicator, onboard data capture and storage, overpressure alarm, RS-232 remote interface and other advanced features to simplify testing, improve safety and prevent calibration errors and damage to equipment
- Optional foot switch accessory allows hands-free data collection when running AutoTests
- Rechargeable battery pack and transport case options for field operation

Specifications: Fluke Calibration 6531, 6532 E-DWT Electronic Deadweight Tester Kits

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 range	Up to 200 MPa (30k psi), depending on configuration
Operating medium	All 6531 and 6532 E-DWT Kits are shipped dry, standard preparation. Can be filled with di-ethyl-hexyl sebacate, silicon oils, propylene glycol, fully fluorinated liquids, partially fluorinated liquids, isopropyl alcohol and distilled water or mineral oil.
Reservoir capacity	300 cc (18 in3)
Variable volume displacement	3 cc (0.18 in3), 200 MPa (30,000 psi) maximum
Filling and priming pump displacement	3.7 cc (0.23 in3)
TEST pressure connection	DH500 female, 200 MPa (30k psi) maximum working pressure. Adapters included for 1/8 in, 1/4 in, 3/8 in and 1/2 in NPT, 1/8 in, 1/4 in, 3/8 in and 1/2 in BSP, M20 x 1.5 and M14 x 1.5. Adapter maximum working pressure is 140 MPa (20k psi). Note: DH500 is a gland and collar type fitting for 6 mm (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
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:	RS-232 (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 (50 °F to 104 °F)
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	200 MPa (30,000 psi) ranges: ± 0.018 % of reading or 0.0036 % of Q-RPT span, whichever is greater All other ranges: ± 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:	200 MPa (30,000 psi) ranges: ± 0.02 % of reading or 0.004 % of Q-RPT span, whichever is greater All other ranges: ± 0.02 % of reading or 0.002 % of Q-RPT span, whichever is greater
Two year:	200 MPa (30,000 psi) ranges: ± 0.025 % of reading or 0.005 % of Q-RPT span, whichever is greater All other ranges: ± 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 ºC to 40 ºC 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.

Ordering information

6531-14M

E-DWT-H A14M, 1.4 to 14 MPa, 200 to 2,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6531-20M

E-DWT-H A20M, 2 to 20 MPa, 300 to 3,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6531-40M

E-DWT-H A40M, 4 to 40 MPa, 600 to 6,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6531-70M

E-DWT-H A70M, 7 to 70 MPa, 1,000 to 10,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6531-140M

E-DWT-H A140M, 14 to 140 MPa, 2,000 to 20,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6531-200M-B

E-DWT-H A200M, 20 to 200 MPa, 6,000 to 30,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6532-70M

E-DWT-H A70M/A7M, 0.7 to 70 MPa, 100 to 10,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6532-140M

E-DWT-H A140M/A14M, 1.4 to 140 MPa, 200 to 20,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6532-200M-B

E-DWT-H A200M/A20M, 4 to 200 MPa, 600 to 30,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

6531-7M

E-DWT-H A7M, 0.7 to 7 MPa, 100 to 1,000 psi

- E-DWT-H Electronic Deadweight Tester with power supply and operating manual
- Vacuum liquid fill kit
- Test station quick-mount fitting
- NPT adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- BSP adapters: 1/8 in, 1/4 in, 3/8 in and 1/2 in
- Metric adapters: M20 x 1.5 and M14 x 1.5

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