

# E-DWT-10000-AF™

## Electronic Deadweight Tester

## Technical Data

### Features

- 0 MPa to 70 MPa (10 000 psi) range
- $\pm 0.1\%$  of reading measurement uncertainty from 1% to 100% of range
- 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 filling and priming system
- "Ready" indication based on pressure stability
- Electronic output allows automated data collection using calibration software
- Compact and transportable—rechargeable battery pack for 8 hours of field operation
- Selected by the US Air Force to replace conventional, mass/piston-cylinder based deadweight testers



E-DWT-10000-AF is an electronic calibrator designed to replace mechanical piston-cylinder based deadweight testers. E-DWT is 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.

With E-DWT you get a high performance hydraulic pressure calibration system that combines an electronic reference pressure monitor (RPM4) and manually operated pressure generation and control hardware in a single, compact and rugged package.

E-DWT 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 hardware. The electronic reference pressure monitor is a special version of DHI's RPM4, designated RPM4-E-DWT A70M/A7M-AF. It covers the range from 0 to 10 000 psi gauge pressure using two high precision quartz reference pressure transducers, proven over 20 years in thousands of DHI calibration products.

E-DWT includes on-board calibration routines to assist in setting up, running and taking data, particularly when calibrating analog gauges.

RPM4-E-DWT A70M/A7M-AF includes an AutoRange feature to automatically select the most appropriate Q-RPT and to optimize the E-DWT setup to cover the desired range of operation. 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.

RPM4-E-DWT A70M/A7M-AF is controlled locally by the operator using its front panel display, keypad and an optional foot pedal or remotely by a computer using COMPASS calibration software or ASCII character command strings over its RS-232 interface.

The E-DWT-10000-AF package was specifically configured for the US Air Force. It includes the E-DWT instrument, two eight-hour battery packs, adaptors and a rugged, molded plastic transport case.

## Specifications

Power requirements	RPM4-E-DWT	12 V dc, 1.2 A
	AC V to 12 V dc power supply	100 V to 240 V ac, 50 Hz to 60 Hz
Temperature	Operating	18 °C to 28 °C (64.4 °F to 82.4 °F)
	Storage	-20 °C to 70 °C (4 °F to 158 °F)
Relative humidity	Operating	0 % to 70 %
	Storage (in case)	0 % to 100 %
Weight	14 kg (30 lb) approx.	
	27 kg (60 lb) approx. with accessories in case	
Dimensions	(W x D)	41.4 cm x 37.1 cm (16.3 in x 14.6 in)
	(H)	26.9 cm (10.6 in.), 33.6 cm (13.2 in.) to max variable volume handle height
	System transport case (H x W x D)	39.4 cm x 79.5 cm x 51.8 cm (15.5 in x 31.3 in x 20.4 in)
Pressure range	0 psi to 10 000 psi (70 MPa) gauge pressure	
Operating medium	Oil (di-ethyl-hexyl sebacate)	
Reservoir capacity	300 cc (18 in <sup>3</sup> )	
Variable volume displacement	3 cc (0.18 in <sup>3</sup> )	
Priming pump displacement	3.7 cc (0.23 in <sup>3</sup> )	
TEST pressure connection	DH500 female, adaptors to 1/4 in and 1/8 in NPT female included*	
Pressure Limits	Maximum working pressure	10 000 psi (70 MPa)
	Maximum pressure without damage	12 000 psi (80 MPa)
	Internal rupture disk burst pressure	11 500 psi (80 MPa)
Maximum working pressure	1 000 psi (7 MPa)	
Maximum pressure without damage	2 200 psi (15 MPa)	
Pressure relief valve setting	1 500 psi (10 MPa)	
Maximum priming pump pressure	100 psi (700 kPa)	
Communication ports	RS-232 (COM1, COM2)	

## Ordering information

**Model**  
**E-DWT-10000-AF**  
Electronic deadweight tester

**Includes:** Two 12 V dc power packs, test connection adaptors, A2LA accredited calibration report, manual

## Measurement specifications (Q-RPT)

	A7M Q-RPT	A70M Q-RPT
Maximum range	1 000 psi (7 MPa)	10 000 psi (70 MPa)
Resolution	0.01 % of active range default. User adjustable to 1 ppm of Q-RPT maximum or 10 ppm of active AutoRange, whichever is larger.	
Precision <sup>1</sup>	± 0.015 % of reading, or 0.045 psi, whichever is larger	± 0.015 % of reading, or 0.45 psi, whichever is larger
Temperature effect <sup>2</sup>	± 0.0006 % of span per °C deviation from calibration temperature (23 °C)	
Predicted stability <sup>3</sup>	± 0.01 % of reading or 0.02 psi, whichever is greater	± 0.01 % of reading or 0.1 psi, whichever is greater
Measurement uncertainty <sup>4</sup>	± 0.1 % of reading, or 0.1 psi, whichever is greater	± 0.1 % of reading, or 1.0 psi, whichever is greater
Warm up time	15-minute temperature stabilization recommended from cold power up	
Compensated temperature range	5 °C to 35 °C (41 °F to 95 °F)	
Operating temperature range	18 °C to 28 °C (64.4 °F to 82.4 °F)	

<sup>1</sup> Combined linearity, hysteresis, and repeatability.

<sup>2</sup> Maximum influence of ambient temperature on indicated pressure from 0 °C to 50 °C (32 °F to 122 °F)

<sup>3</sup> Predicted Q-RPT measurement stability limit (k=2) over two years assuming regular use of AutoZero function and short term stability between rezeroing. As stability can only be predicted and varies from Q-RPT to Q-RPT, stability for a specific Q-RPT should be established from experience.

<sup>4</sup> Maximum deviation of the Q-RPT indication from the true value of applied pressure including precision, predicted two year stability with rezeroing, temperature effect from 18 °C to 28 °C (64.4 °F to 82.4 °F) and calibration uncertainty (assumes calibration reference uncertainty of ± 0.02 % of reading, k=2), combined and expanded (k=2) following the ISO "Guide to the Expression of Uncertainty in Measurement."

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