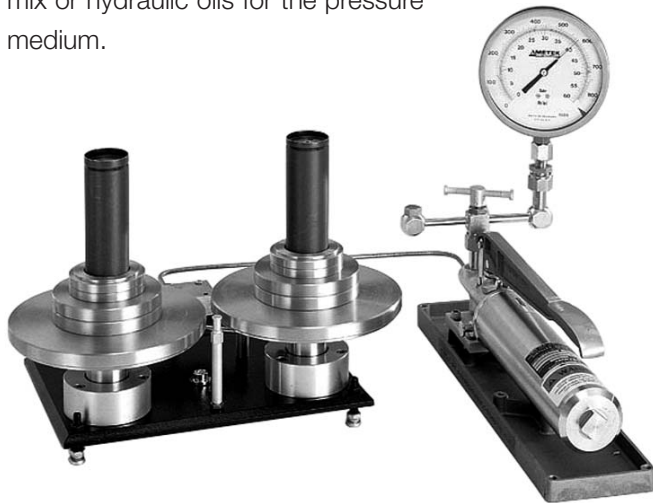


Type T Hydraulic Deadweight Tester

M&G DEADWEIGHT TESTERS

The M&G Type T Hydraulic Deadweight Tester offers laboratory accuracy in an instrument that is designed to withstand an industrial environment. These testers are designed to be primary pressure standards and are available in several ranges and engineering units.

The M&G Type T Deadweight tester is available in ranges to 15,000 psi / 1,000 bar. This robust tester has been engineered to withstand the stresses of daily operation in a manufacturing environment and still maintain its accuracy and repeatability. The Type T is constructed of 300 series stainless steel and Monel and is supplied with Buna N O-rings as a standard unit. Viton and EPT O-rings are optional. This deadweight can use a water/alcohol mix or hydraulic oils for the pressure medium.



FEATURES

PRESSURE RANGES

To 15,000 psi
To 1,000 bar
To 1,000 kg/cm²
To 100,000 kPa

ACCURACIES

To 0.015% of reading

FLEXIBLE

Configurations to meet differing applications

ROBUST

Construction allows for repeated daily use

TRACEABLE

Certification supplied with each tester

PROVEN

In design and application to meet your needs

COMPLETE

Tester with tools, cases, and fittings

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Type T Hydraulic Deadweight Tester

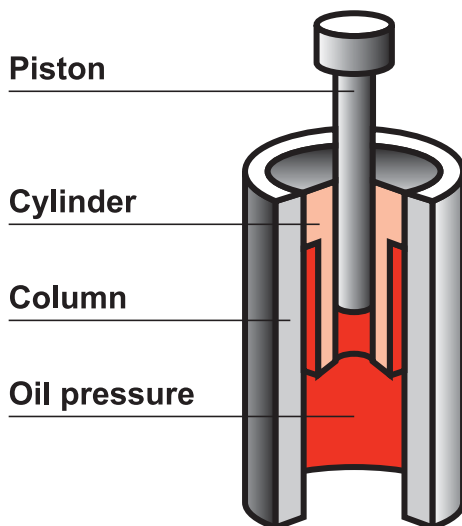
THREE ACCURACIES AVAILABLE

These instruments are available in $\pm 0.100\%$, $\pm 0.025\%$, and $\pm 0.015\%$ of reading. The accuracy stated is the overall accuracy of the tester. The accuracy takes into account linearity, hysteresis, and repeatability. It would also account for intrinsic corrections. Site corrections are the user's responsibility and the unit will not perform as specified without them. The testers are manufactured to either International Standard Gravity of 980.665 gallons or to a user specified local gravity.

RE-ENTRANT PISTON/CYLINDERS

The Type T deadweight employs a re-entrant type piston/cylinder assembly. This design applies test fluid to the outside and inside of the cylinder. Unlike a simple piston/cylinder, this configuration reduces clearance between the piston and cylinder as pressure increases. This reduces the rate of fluid leakage and increases float time, offers the technician more time for testing, and reduces the amount of pumping necessary to sustain the fluid loss.

RE-ENTRANT SYSTEM



CONFIGURATIONS

There are two important factors in the selection of the proper deadweight configuration for your application: ranges and location. If you have applications for a single range of tests, then a single piston/cylinder model is a good choice. However, if you have some high pressure and some low pressure testing, the Type T is available with dual piston/cylinder assemblies that are interchangeable and operate using the same weight set ($\pm 0.100\%$ and $\pm 0.025\%$ accuracies) or utilize dedicated weight sets for each piston/cylinder assembly ($\pm 0.015\%$ accuracy).

If you have the need to use the tester in a location other than a lab, you may need a smaller and more mobile configuration. The single column configuration will be your best selection. These are available with dual piston/cylinder assemblies.

For the applications where the tester will be stationary, the dual column configuration is a good choice for those needing multiple ranges. These are supplied with two piston/cylinder assemblies and both columns are installed and ready for use. A selector valve is used to determine which column is in service at any given time.

WORLDWIDE ENGINEERING UNITS

The M&G Type T deadweight tester can be manufactured in four different engineering units: psi, bar, kg/cm^2 , and kPa. All of the different engineering units are available in any of the configurations.

PRESSURE MEDIA

Because the Type T is manufactured using 300 series stainless steel and Monel, you can use either hydraulic fluids compatible with the material or a water/alcohol mixture. We also offer EPT and Viton® o-rings as options. This increases your media options. Additionally, we offer an isolation membrane to protect your piston/cylinder assemblies from abrasive media. This facilitates the use of other fluids as process media but allows for the benefits of MGAAA oil within the column, which preserves your calibrated parts.

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Type T Hydraulic Deadweight Tester

OVERHUNG WEIGHT CARRIERS

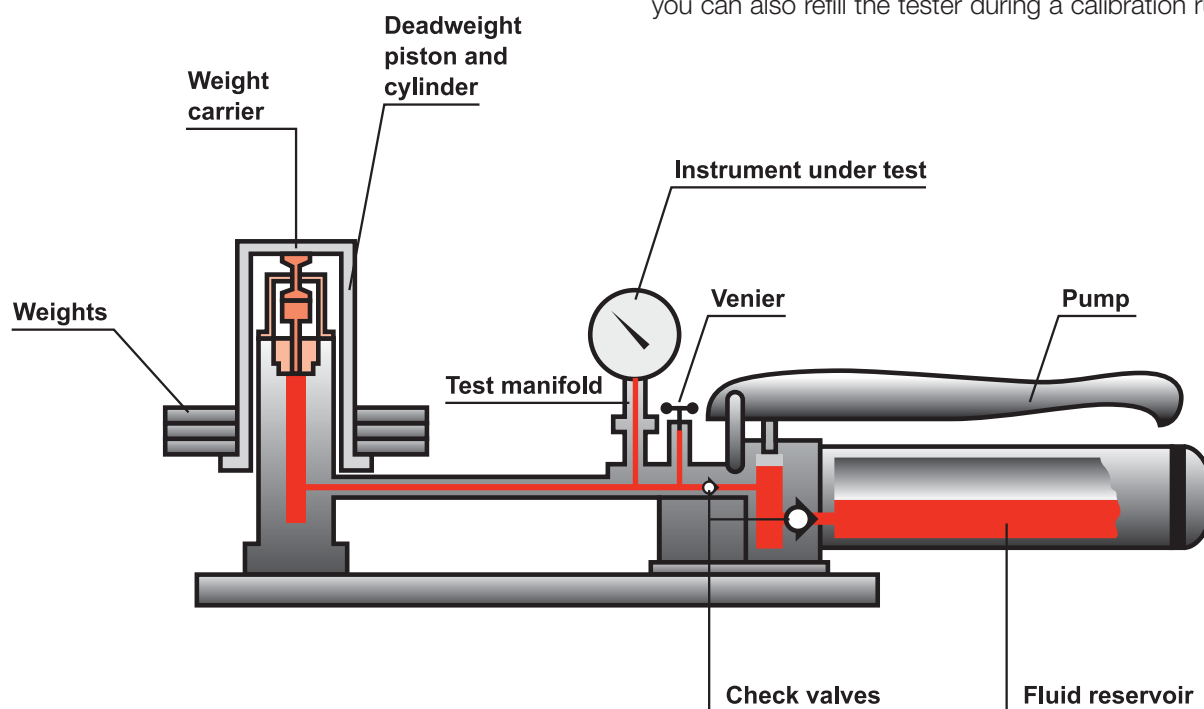
Another feature of this AMETEK deadweight tester is the way that the weights are positioned on the carrier. Many competitors use a stacked platform configuration where all of the weights are placed atop the column. M&G utilizes an overhung weight carrier design. This design employs a tube carrier that is positioned over the column and onto the piston driver. The center of gravity for the stack of weights is lowered, reducing side thrust and friction; which lengthens the life of the piston/cylinder assembly. This also improves measurement accuracy.

PROTECTED PISTON/CYLINDER

The piston and cylinder assembly are enclosed in the column of the tester. The weight carrier floats on the piston driver preventing damage to the piston/cylinder assembly. Additionally, the piston/cylinder assembly is engineered with positive over-pressure protection by restricting vertical movement. This protects the assembly from damage in the event of weight removal under pressure.

DUAL VOLUME PUMP

The Type T pump offers a dual volume pumping feature that allows for large volume of fluid to be added at low pressures to fill the system and increase pressure rapidly. Once the system is filled, you can switch the output volume to a smaller volume. This eases pumping and also provides for finer control in higher pressure ranges. The reservoir is kept at atmospheric pressure meaning that you can also refill the tester during a calibration run.



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Type T Hydraulic Deadweight Tester

ORDERING INFORMATION

Single column / Single piston/cylinder units

MODEL	ENGINEERING UNITS	RANGE	INCREMENT	PISTON AREA
T-5	psi	10–500	5	1/10 in ²
T-10	psi	10–1,000	5	1/10 in ²
T-15	psi	10–1,500	5	1/10 in ²
T-20	psi	20–2,000	10	1/20 in ²
T-30	psi	10–3,000	10	1/20 in ²
T-55	psi	50–5,000	25	1/50 in ²
T-110/TESTER	psi	100–10,000	50	1/100 in ²
T-155	psi	100–15,000	50	1/100 in ²
TSQ-40M-1/C	kg/cm ²	1–40	0.5	1/10 in ²
TSQ-70M-1/C	kg/cm ²	1–70	0.5	1/10 in ²
TSQ-100M-1/C	kg/cm ²	1–100	0.5	1/10 in ²
TSQ-200M-1/C	kg/cm ²	2–200	1	1/20 in ²
TSQ-400M-1/C	kg/cm ²	10–400	5	1/100 in ²
TSQ-700M-1/C	kg/cm ²	10–700	5	1/100 in ²
TSQ-100M-1/C	kg/cm ²	10–1,000	5	1/100 in ²
TSQ-40B-1/C	bar	1–40	0.5	1/10 in ²
TSQ-70B-1/C	bar	1–70	0.5	1/10 in ²
TSQ-100B-1/C	bar	1–100	0.5	1/10 in ²
TSQ-200B-1/C	bar	2–200	1	1/20 in ²
TSQ-400B-1/C	bar	10–400	5	1/100 in ²
TSQ-700B-1/C	bar	10–700	5	1/100 in ²
TSQ-1000B-1/C	bar	10–1,000	5	1/100 in ²
TSQ-4000N-1/C	kPa	100–4,000	50	1/10 in ²
TSQ-7000N-1/C	kPa	100–7,000	50	1/10 in ²
TSQ-10000N-1/C	kPa	100–10,000	50	1/10 in ²
TSQ-20000N-1/C	kPa	200–20,000	100	1/20 in ²
TSQ-40000N-1/C	kPa	1,000–40,000	500	1/100 in ²
TSQ-70000N-1/C	kPa	1,000–70,000	500	1/100 in ²
TSQ-100000N-1/C	kPa	1,000–100,000	500	1/100 in ²

Metric units are supplied with Complete Data Certifications as indicated by "/C".
 Metric units are supplied with 0.025% of Reading Accuracy as indicated by "-1".

Single column / Dual piston/cylinder units

MODEL	ENGINEERING UNITS	RANGE	INCREMENT	PISTON AREA
T-50	psi	10–500	5	1/10 in ²
		100–5,000	50	1/100 in ²
T-65	psi	10–650	5	1/10 in ²
		100–6,500	50	1/100 in ²
T-100	psi	10–1,000	5	1/10 in ²
		100–10,000	50	1/100 in ²

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Type T Hydraulic Deadweight Tester

Single column / Dual piston/cylinder units (continued)

MODEL	ENGINEERING UNITS	RANGE	INCREMENT	PISTON AREA
T-130/TESTER	psi	10—1,300	5	1/10 in ²
		100—13,000	50	1/100 in ²
T-150	psi	10—1,500	5	1/10 in ²
		100—15,000	50	1/100 in ²
TQD-400M	kg/cm ²	1—40	0.5	1/10 in ²
		10—400	5	1/100 in ²
TQD-700M	kg/cm ²	1—70	0.5	1/10 in ²
		10—700	5	1/100 in ²
TQD-1000M	kg/cm ²	1—100 0.	5	1/10 in ²
		10—1,000	5	1/100 in ²
TQD-400B	bar	1—40	0.5	1/10 in ²
		10—400	5	1/100 in ²
TQD-700B	bar	1—70	0.5	1/10 in ²
		10—700	5	1/100 in ²
TQD-1000B	bar	1—100 0.	5	1/10 in ²
		10—1,000	5	1/100 in ²
TQD-40000N	kPa	100—4,000	50	1/10 in ²
		1,000—40,000	500	1/100 in ²
TQD-70000N	kPa	100—7,000	50	1/10 in ²
		1,000—70,000	500	1/100 in ²
TQD-100000N	kPa	100—10,000	50	1/10 in ²
		1,000—100,000	500	1/100 in

Dual column / Dual piston/cylinder units

MODEL	ENGINEERING UNITS	RANGE	INCREMENT	PISTON AREA
DM-T-50	psi	10—500	5	1/10 in ²
		100—5,000	50	1/100 in ²
DM-T-100	psi	10—1,000	5	1/10 in ²
		100—10,000	50	1/100 in ²
DM-T-150	psi	10—1,500	5	1/10 in ²
		100—15,000	50	1/100 in ²
DM-TQ-400M	kg/cm ²	1—40	0.5	1/10 in ²
		10—400	5	1/100 in ²
DM-TQ-700M	kg/cm ²	1—70	0.5	1/10 in ²
		10—700	5	1/100 in ²
DM-TQ-1000M	kg/cm ²	1—100 0.	5	1/10 in ²
		10—1,000	5	1/100 in ²

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Type T Hydraulic Deadweight Tester

Dual column / Dual piston/cylinder units (continued)

MODEL	ENGINEERING UNITS	RANGE	INCREMENT	PISTON AREA
DM-TQ-400B	bar	1—40	0.5	1/10 in ²
		10—400	5	1/100 in ²
DM-TQ-700B	bar	1—70	0.5	1/10 in ²
		10—700	5	1/100 in ²
DM-TQ-1000B	bar	1—100	0.5	1/10 in ²
		10—1,000	5	1/100 in ²
DM-TQ-40000N	kPa	100—4,000	50	1/10 in ²
		1,000—40,000	500	1/100 in ²
DM-TQ-70000N	kPa	100—7,000	50	1/10 in ²
		1,000—70,000	500	1/100 in ²
DM-TQ-100000N	kPa	100—10,000	50	1/10 in ²
		1,000—100,000	500	1/100 in ²

Special 0.015% Accuracy units

MODEL	ENGINEERING UNITS	RANGE	INCREMENT	PISTON AREA
DM-T-150-1AL/C	psi	10—1,500	5	1/10 in ²
		100—15,000	50	1/100 in ²
DM-TQ-1000M-1AL/C	kg/cm ²	1—100	0.5	1/10 in ²
		10—1,000	5	1/100 in ²
DM-TQ-1000B-1AL/C	bar	1—100	0.5	1/10 in ²
		10—1,000	5	1/100 in ²
DM-TQ-10000N-1AL/C	kPa	100—10,000	50	1/10 in ²
		1,000—100,000	500	1/100 in ²

These configurations are at Local Gravity (supplied on the Order)
Units have one independent weight set for each piston/cylinder combination
Other configurations are considered upon request

Options

Accuracy:	for 0.025% of Reading <i>These units are all supplied with Data</i>	add "-1/C" to model number
	for 0.015% of Reading* <i>0.015% units are not considered standard and are subject to quotation of user specifications</i>	add "-1AL/C" to model number
	<i>These units are all supplied with Data, Local gravity, and Special Weight Sets</i>	
Gravity:	for Local Gravity <i>Gravity must be specified on order in gals.</i>	add "L" to model number
Certification:	for Traceable Certification with Data	add "/C" to model number

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Type T Hydraulic Deadweight Tester

Examples

T-50	with Local Gravity	T-50/L
T-50	with Certification with Data	T-50/C
T-50	with 0.025% Accuracy	T-50-1/C
T-50	with Local Gravity and 0.025% Accuracy	T-50-1L/C

Accessories

- Small Incremental Weight Sets
- Additional Piston/Cylinder Assemblies
- Additional Weight Sets
- Additional Column Assemblies for conversion of Single Column units to Dual Column
- Fittings and Adapters
- MG AAA Tester Oil
- Separator Membranes

Service and Calibration

Contact AMETEK or your Local AMETEK Representative for quality service for your deadweight testers

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Type T Hydraulic Deadweight Tester

FUNCTIONAL SPECIFICATIONS

Accuracy

Standard: +0.100 % of reading

Optional: ± 0.025 % of reading

Optional: ± 0.015 % of reading

Maximum output pressure

15,000 psi—1,000 bar—1,000 kg/cm²—100,000 kPa

Gravity

Standard: 980.665 gals International Standard Gravity

Optional: Customer specified gravity reference

FUNCTIONAL SPECIFICATIONS

Test Fluid

Distilled water/alcohol mix standard, MGAAA oil optional

Wetted parts

300 Series Stainless Steel, Monel

O-Rings Standard: Buna N
 Optional: Viton®, EPT

Reservoir capacity

75 in³ / 1.23 L

Weight

Tester & Case: 50 lbs / 22.7 kg

Weight Sets: 55 to 210 lbs / 25 kg to 95.3 kg

TEMPERATURE SOFTWARE PRESSURE SIGNAL

CALIBRATION INSTRUMENTS

Offers a complete range of calibration equipment for pressure, temperature, and signal—including software

PRIMARY PRESSURE STANDARDS

Pneumatic floating-ball or hydraulic piston deadweight testers: 4 series with over 20 models—easy to use with accuracies up to 0.015% of reading

ELECTRONIC PRESSURE STANDARDS

Convenient electronic systems ranging from 25 inHg vacuum to 10,000 psi / -1 to 700 bar—multiple choices of pressure ranges, pumps, systems, and accuracies

SIGNAL CALIBRATION

Process signal measurement and simulation for easy control, loop calibration and measurement tasks, measure and simulate thermocouples and RTDs.

...because calibration is a matter of confidence

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