

# GE Infrastructure Sensing

## Features

- The most comprehensive range
- Gauge pressure
- Absolute pressure
- Vacuum
- Separators and comparison test pumps

Deadweight testers are the basic primary standard used world-wide for the accurate measurement of pressure.

No other piece of equipment can match the stability, repeatability and accuracy of the deadweight tester. It is ideal for calibrating pressure gauges, transducers, transfer standards, recorders, digital calibrators, etc. and can also be used to directly measure the pressure in systems and processes where precise readings are important.

## Pressurements Deadweight Testers

Pressurements is a GE Druck product. GE Druck has joined other GE high-technology sensing businesses under a new name—GE Infrastructure Sensing.



# GE Infrastructure Sensing

Using the well proven piston gauge system, which consists of a vertically mounted precision lapped piston and cylinder assembly, accurately calibrated masses are loaded onto the piston, which rises freely within its cylinder. These weights balance the upward force created by the application of pressure within the system.

GE offers one of the most comprehensive series of dead-weight testers available, covering a wide variety of applications and ranges of pressure and vacuum. The piston assemblies are manufactured to the very highest standards with certified accuracies traceable to international standards laboratories such as the National Institute of Standards and Technology (NIST).

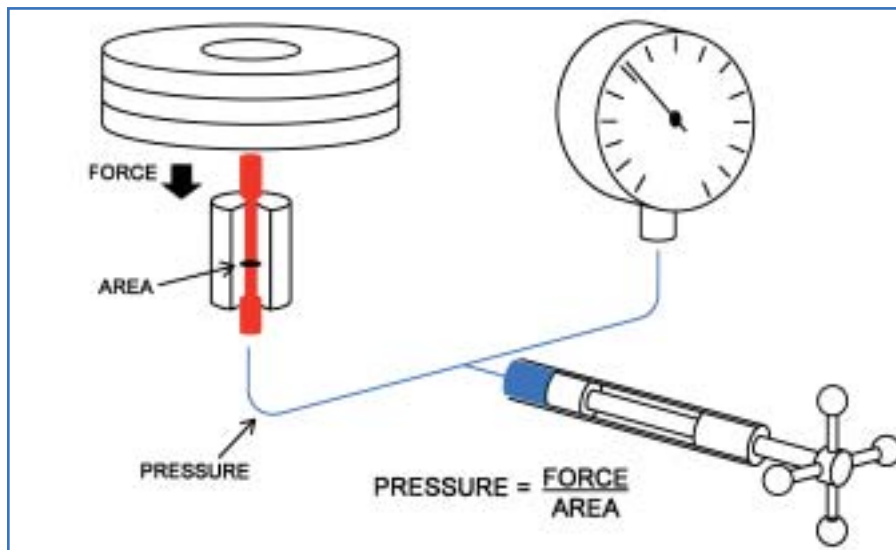
Gravity varies significantly with geographical location and this variation has a direct effect on the force of the weights and the accuracy of the deadweight tester. Each instrument can be calibrated to local gravity at no extra cost. If unspecified, instruments will be supplied calibrated to standard gravity 980.665 cm/s<sup>2</sup>.

Instruments are supplied with an integral carrying case, making them neat, compact and easily portable. Components are stored in the detachable lid, which also provides excellent protection from dirt and damage when the tester is in transit or storage. Unique test station connections allow quick hand-tight sealing, no need for polytetrafluoroethylene (PTFE) tape and wrenches. A spirit level and adjustable feet are provided to enable the operator to level the instrument. A flotation indicator is mounted on the top plate, removing guesswork when floating the piston. Weights are stored in a separate box.



## Standard with Every Deadweight Tester

- One year guarantee against normal operating failure
- 1/8, 1/4, 3/8, 1/2 NPT or BSP female adaptors
- Calibrated weight set in carrying case
- Traceable certificate of overall accuracy
- Individual piston certificate
- Operating fluid (where applicable)
- Spare seals



# GE Infrastructure Sensing

## Hydraulic Deadweight Testers



- \*Accuracy better than 0.015% of reading. 0.008% optional
- Dual piston models allow calibration over a wide range. Piston automatically selected without valving or piston exchange
- Overhanging weight carrier protects carbide piston, improves rotational spin, sensitivity and stability.
- Water models eliminate oil contamination.
- Pressure is generated by a ram screw.

### Oil Operated Models

#### Dual Piston Series

Model	Range
M2000	10 to 5000 psi (1 to 350 bar)
M2200	10 to 10,000 psi (1 to 700 bar)
M2800	10 to 16,000 psi (1 to 1100 bar)

#### Single Piston Series

Model	Range
M1800	10 to 500 psi (1 to 35 bar)
M4000	40 to 2000 psi (4 to 140 bar)
M2000/H	100 to 5000 psi (10 to 350 bar)
M2200/H	200 to 10,000 psi (20 to 700 bar)
M2800/H	200 to 16,000 psi (20 to 1100 bar)
M3830	500 to 30,000 psi (40 to 2000 bar)
M3840	500 to 40,000 psi (40 to 2600 bar)
M3860	500 to 60,000 psi (40 to 4000 bar)

### Water Operated Models

#### Dual Piston Series

Model	Range
W2000	10 to 5000 psi (1 to 350 bar)
W2200	10 to 10,000 psi (1 to 700 bar)

#### Single Piston Series

Model	Range
W1800	10 to 500 psi (1 to 35 bar)
W2000/H	100 to 5000 psi (10 to 350 bar)
W2200/H	200 to 10,000 psi (20 to 700 bar)

*Other units available including Kgf/cm<sup>2</sup> and kPa*

### Built-In Hand Pump

- Large volume systems are easily primed
- Greatly speeds up priming and pressure generation
- Enables an effortless, small bore, high pressure ram screw to be fitted
- There is no additional valve operation involved.
- Standard on M2800, not available on M3800 Series

### Motor Drive

If a continuous pressure is required, a motor drive can be provided to rotate the weights. Rotating the weights by hand is satisfactory for standard calibrations. The motor is isolated from the deadweight tester by a thermal barrier, preventing warming of the measuring piston. The motor is suitable for 210/250, 105/125 volts at 50/60 Hz, please specify requirements at time of order.

*Not available on models M2800, M2800/H and M3800 Series*



*Built-in hand pump*

*Motor drive*

# GE Infrastructure Sensing

## Pneumatic Deadweight Testers



- \*Accuracy better than 0.015% of reading. 0.008% available
- Instruments to 150 psi (10 bar) are supplied with built-in hand pumps.
- Instruments up to 2000 psi (140 bar) and vacuum operate from an external air supply. Hand pumps can be supplied for both pressure and vacuum.
- T2700, T2900 are fitted with a ram screw for fine control.

### Optional Extras

- Built-in hand pumps to generate pressure (up to 150 psi/10 bar) and/or vacuum (up to 80%)
- Fitted as standard on models T1150, T1100 and T2500

### Lightweight Pressure Models

Model	Range
T5100	5 to 100 in H <sub>2</sub> O (15 to 300 mbar)
T5250	5 to 250 in H <sub>2</sub> O (15 to 600 mbar)
T5400	5 to 400 in H <sub>2</sub> O (15 to 1000 mbar)
T5800	12 to 800 in H <sub>2</sub> O (30 to 2000 mbar)

### Pressure Models

Model	Range
T1150	5 to 400 in H <sub>2</sub> O (15 to 1000 mbar)
T1100	12 to 800 in H <sub>2</sub> O (30 to 2000 mbar)
T2500	3 to 150 psi (0.2 to 10 bar)
T2300	3 to 500 psi (0.2 to 35 bar)
T2700	10 to 1000 psi (4 to 70 bar)
T2900	10 to 2000 psi (4 to 140 bar)

Model	Range
T2700/L	10 to 1000 psi (1 to 140 bar)
T2900/L	10 to 2000 psi (1 to 140 bar)

*These instruments are fitted with liquid lubricated piston assemblies where cleanliness and environmental control cannot be assured.*

*All the above models are available in other pressure units.*

### Vacuum Models

Model	Range
T2600	1 to 30 in Hg (0.03 to 1 bar) vacuum

### Combined Pressure and Vacuum Models

Two instruments in one, with a selector valve for pressure (P) or vacuum (V).

Model	Range
T3550	V-1 to 30 in Hg (0.03 to 1 bar) P-5 to 400 in H <sub>2</sub> O (15 to 1000 mbar)
T3580	V-1 to 30 in Hg (0.03 to 1 bar) P-12 to 800 in H <sub>2</sub> O (30 to 2000 mbar)
T3500	V-1 to 30 in Hg (0.03 to 1 bar) P-3 to 500 psi (0.2 to 35 bar)



*Vacuum model*

*Pressure and vacuum model*

# Hydraulic Specifications

## General

<b>*Accuracy</b>	
<i>M &amp; W</i>	±0.015% of reading (±0.008% when specified)
<i>M3800 Series</i>	0.02% of reading (±0.015% when specified)
<i>L Series</i>	±0.05% of reading (±0.025% when specified)
<i>P7000 Series</i>	±0.005% of reading
<b>Total Instrument Weight</b>	
<i>M3800 Series</i>	24.6 lb (12 kg) 70 lb (32 kg)
<b>Total Boxed Weight Set</b>	
<i>Up to 10,000 psi (700 bar)</i>	66 lb (30 kg)
<i>M2800</i>	106 lb (48 kg)
<i>M3830</i>	264 lb (120 kg)
<i>M3860</i>	396 lb (180 kg)
<b>Instrument Size (l x d x h)</b>	
<i>M3800 Series</i>	18.5 x 12.5 x 8 in (47 x 32 x 20 cm)

\*Accuracy based on % of reading from 10% to 100% of the piston range when used in accordance with the corrections found on the calibration certificate. Below 10%, ± (accuracy class) x 10% of the piston range.

## Material of Construction

<b>Weight Material</b>	Series 3 non-magnetic stainless steel
<b>Weight Density</b>	7.9 g/cm <sup>3</sup>
<b>Piston Material</b>	
<i>Oil Operated</i>	Tungsten carbide
<i>Water Operated</i>	Stellite; up to 500 psi (35 bar)
<i>Above 500 psi (35 bar)</i>	Tungsten Carbide
<b>Cylinder Material</b>	
<i>Water above 500 psi (35 bar)</i>	Hardened martensitic steel Tungsten Carbide

## Weight Increment

<b>Minimum Standard Weight Increment</b>	
<i>Low Pressure Piston</i>	1 psi (0.05 bar)
<i>High Pressure Piston</i>	x10 or 20; models above 5000 psi (350 bar)
<i>M3800 Series</i>	20 psi (1 bar)
<b>Optional Fractional Weights (Aluminum)</b>	
<i>Low Pressure Piston</i>	0.1 psi (0.01 bar)
<i>High Pressure Piston</i>	x10 or 20; models above 5000 psi (350 bar)

# Pneumatic Specifications

## General

<b>*Accuracy</b>	
<i>T Series</i>	±0.015% of reading (±0.008% when specified)
<i>6100 Series</i>	±0.015% of reading (±0.008% when specified)
<i>P7000 Series</i>	±0.005% of reading
<b>Total Instrument Weight</b>	
<i>T5000 Series</i>	22 lb (10 kg) 10 to 66 lb (4.7 to 8 kg)
<b>Total Weight Set</b>	
	Variable from 10 to 66 lb (4.5 to 30 kg)
<b>Instrument Size (l x d x h); including lid</b>	
	11.8 x 12.5 x 8 in (47 x 32 x 20 cm)
<i>T5000 Series</i>	12 x 10 x 5 in (30 x 25 x 13 cm)

\*Accuracy based on % of reading from 10% to 100% of the piston range when used in accordance with the corrections found on the calibration certificate. Below 10%, ± (accuracy class) x 10% of the piston range.

## Material of Construction

<b>Weight Material</b>	Series 3 non-magnetic stainless steel
<b>Weight Density</b>	7.9 g/cm <sup>3</sup>
<b>Piston Material</b>	
<i>Oil Operated</i>	Tungsten carbide
<i>Water Operated</i>	Stellite; up to 500 psi (35 bar)
<i>above 500 psi (35 bar)</i>	Tungsten Carbide
<b>Cylinder Material</b>	
<i>Water above 500 psi (35 bar)</i>	Hardened martensitic steel Tungsten Carbide

## Weight Increment

<b>Minimum Standard Weight Increment</b>	
<i>T2500, T2300, T3500(P)</i>	1 psi (0.05 bar)
<i>T5100, T5250, T5400,</i> <i>T1150, T3550(P)</i>	1 in H <sub>2</sub> O (5 mbar)
<i>T5800, T1100, T3580(P)</i>	2 in H <sub>2</sub> O (10 mbar)
<i>T2700, T2900</i>	1 psi (0.2 bar)
<i>T2600, T3500(V)</i>	0.2 in Hg (0.01 bar)
<b>Optional Fractional Weights (Aluminum)</b>	
<i>T2500, T2300, T3500(P)</i>	0.1 psi (0.01 bar)
<i>T5100, T5250, T5400,</i> <i>T1150, T3550(P)</i>	0.5 in H <sub>2</sub> O (1 mbar)
<i>T5800, T1100, T3580(P)</i>	1 in H <sub>2</sub> O (5 mbar)
<i>T2700, T2900</i>	0.5 psi (0.05 bar)

# GE Infrastructure Sensing

## Comparison Test Pumps

These test pumps are used for checking pressure measuring instruments against master test gauges or transducers. All are portable or can be bench mounted. Supplied with NPT or BSP quick hand-tight sealing gauge adaptors.

### Liquid

This is the most portable and versatile version of our comparison test pumps. These units are based on our standard deadweight tester system. The piston and weights are replaced by a second test station to which either a test gauge, transducer or transfer standard is connected for comparison against the instrument under test. A built-in hand pump is supplied offering the following benefits:

- Large volume systems are easily primed
- A small bore high pressure ram screw is provided offering quick and effortless pressure generation without additional valve operation

*Model T1300 for oil applications*

*Model T1301 for water applications*

Model	Range
T1300 and T1301	0 to 20,000 psi (0 to 1400 bar)



Model T1300

### Liquid

Tested with water and suitable for use with:

- Water
- Mineral/vegetable oil
- Alcohol

Supplied with a reservoir and valve, pressure is quickly generated with the ram screw.

Model	Range
T1200	0 to 10,000 psi (0 to 700 bar)



Model T1200

### Air

Pressure is generated with the sensitive hand pump and is vented with a fine control needle valve.

Model	Range
T4100	0 to 300 psi (0 to 20 bar)



Model T4100

### Vacuum

Vacuum is generated quickly and easily with the hand pump and vented with a fine control needle valve.

Model	Range
T4200	0 to 20 inHg (0 to 800 mbar)



Model T4200

# GE Infrastructure Sensing

## Separators

### Liquid to Air

For high pressure pneumatic calibration, this unit interfaces with hydraulic deadweight testers, giving a rateless liquid to air separation. A series of fluid traps ensures that instrument under test remains dry.

Needle valves control the pressure, and the deadweight tester ram screw controls the fluid level.

*Please specify if interface is for oil or water application.*

Model	Range
API5000/1	0 to 4000 psi (0 to 300 bar)



Model API5000

### Liquid to Liquid

This unit has a flexible Viton® diaphragm, separating the deadweight tester fluid and a non-contaminating liquid. Any liquid can be used that is compatible with Viton and aluminum bronze. The unit also protects the deadweight tester from contamination.

Model	Range
T3600	0 to 8000 psi (0 to 600 bar)
T3601	0 to 10,000 psi (0 to 700 bar)

### Dirt/Moisture Trap

Protects pneumatic deadweight testers, when the cleanliness of the instrument under test cannot be guaranteed. The unit is mounted directly onto the test station. Particles and moisture are trapped within the body, which are visible on Model T4400.

Model	Range
T4400	0 to 500 psi (0 to 35 bar)
T4401	0 to 10,000 psi (0 to 700 bar)



Model T3600



Model T4400

## Ancillary Equipment

### Two Gauge Adaptor

To calibrate two instruments at the same time. This adaptor is mounted directly onto the test station.

Model	Range
T4500	0 to 10,000 psi (0 to 700 bar)

### Angle Adaptor

To calibrate back connection gauges, the angle adaptor fits directly onto the test station, converting it to 90°, allowing the same adaptors to be used.

Model	Range
T3700	0 to 10,000 psi (0 to 700 bar)

### Pointer Remover/Punch

To remove and refit the pointer of a pressure gauge. This two in one tool has a spring loaded plunger to quickly and consistently refit the pointer.



Model T3700



Pointer remover/punch

# GE Infrastructure Sensing

## Combined Absolute and Gauge Pressure Standard Model 6100

- \*Accuracy 0.015% or 0.008% of reading

Pressure Model 6100 operates over an extremely wide pressure range. Three standard ranges (piston and weight set) are available to fit into the instrument base:

Low (L) Range	0.5 to 30 psi (30 to 2000 mbar)
Mid (M) Range	3 to 300 psi (0.2 to 20 bar)
High (H) Range	300 to 1000 psi (20 to 70 bar)

Further information available



Model 6100



P7000

## High Accuracy Pressure Standards P700

- \*Accuracy better than 0.005% of reading
- Integrated hardware and software systems
- Special dual-based deadweight tester calibrating option

The P7000 has been designed for pressure measurements to the highest level of accuracy. The wide range of options ensures maximum flexibility.

Ranges	To 20,000 psi (1400 bar)
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Further information available

## Low Cost Hydraulic Deadweight Tester L Series

- \*Accuracy 0.05% or 0.025% of reading

Ranges	To 10,000 psi (700 bar)
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Further information available

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