

Deadweight Gauges & Testers PORTABLE SERIES

- Portable — in lightweight, all metal cases
- Accurate — 0.1% of indicated pressure, traceable to the National Bureau of Standards (NBS). 0.05%, 0.02% available— see page P19
- Reliable — hardened stainless steel pistons and corrosion resistant materials
- Metric (SI) or US Customary Units calibration
- Certificate of Calibration, optionally available
- Gas or liquid pressure measurement
- Stock delivery, repair service, and spare parts available

The Portable Series of Deadweight Gauges and Testers cover the pressure range from 5 psi to 20,000 psi or in metric units from 100 kPa to 101100 kPa. They are designed to be used in industrial or research applications where extremely accurate pressure measurement or pressure calibration is required. More specifically, they are usually used for accurate checking of gas or liquid pressures in pipelines or industrial plants.

HIGH ACCURACY

Deadweight Gauges blend ruggedness with high accuracy. Variations over time typical of strain gauges or spring gauges are eliminated. Their operation depends only on balancing known weights against the force exerted by an unknown pressure acting on a piston of precisely known area. The weights are applied manually until the piston is floating with no net vertical movement. Each piston's area is determined by comparison against a piston of known area traceable to the National Bureau of Standards. The mass of the balancing weights is also traceable to NBS.

HIGH SENSITIVITY

When the weights are applied to the piston, the entire assembly is rotated slowly. This rotation minimizes frictional effects and permits vertical motion of the piston with extremely small variations in pressure. Measurements to 1/10 psi (1 kPa) can be made.

DEADWEIGHT GAUGES

Gauges are used to measure the pressure exerted by a gas or liquid and cannot generate a test pressure. They are accurate to 0.1% of indicated pressure. This is a significant improvement over gauges that are accurate to 0.1% of full scale. Their portability means that they can be conveniently used to check line pressure, gas pressures at well head, static pressures on orifice meters, and to



Photograph Courtesy of Coastal Corporation

measure pressures in many other industrial applications. They have been used for turbine testing in power generation plants.

The 5-125 and 5-170 have an electric motor for rotating the weights to minimize friction. These gauges are manufactured for use on 115V, 60 Hz power or on 220V, 50 Hz power.

DEADWEIGHT TESTERS

Testers can be used as gauges and additionally have a manually controlled pump which can generate the pressure needed to calibrate spring gauges or strain gauges. Valves are included which permit rapid, convenient switching between functions. Each tester has an integral oil reservoir to provide the pressure medium needed for calibrating purposes. This also permits testing of small pressure vessels.

SPECIFICATIONS

Shipping Weight	23 kg (50 lb) to 115 kg (250 lb) depending on pressure range of model ordered
Size	Series 15, 23: 480 x 150 x 330 mm (19" x 6" x 13") Series 5, 2: 530 x 200 x 360 mm (22" x 8" x 14") Series 55: 530 x 360 x 450 mm (22" x 14" x 18")
Maximum Pressure	Up to 101100 kPa (or 20,000 psi)
Minimum Pressure	5 or 50 psi depending on range (see Ordering Information, page P 20)

Accuracy 0.1% of indicated pressure

Certificate of Calibration Available upon request.
Accuracy 0.05%. Special 0.02% Certificate available upon request. See page 19

Calibration Temperature 25° C (77°F) Calibration based on standard gravity of 980.665 cm/sec.²

Calibration Meets MIL-C-45662A

Temperature Limit 4 to 50° C (40 to 120°F)

Humidity 0 to 95% RH

Vibration Small amplitude, high frequency only

Environment Minimize dust and corrosive atmosphere

Motor Driven Weight Spinner See Models 5-125 and 5-170

Piston Material Hardened stainless steel

Pressure Tubing Material Stainless steel

Weight Materials Brass or stainless steel

Smallest Weight Supplied See Ordering Information

Fill Fluid Mineral oil, standard (P -1169 synthetic fluid optional for special requirements)

Oil Flash Point 232°C (450°F)

Input Connector 1/4" NPT

Seal Material Buna-N

Carrying Case Metal case with handles. The Series 5 and 55 instruments have separate cases for weights.

ALL DATA AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

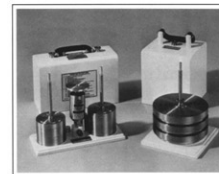
PRINCIPLE OF OPERATION

The unknown liquid or gas pressure is measured by connecting the gauge to the unknown and then balancing the force that the unknown exerts against a piston with a known area. Weights are applied manually as the vertical movement of the piston is observed while rotating. When no net vertical piston motion is seen, the pressure is determined by counting the calibrated weights used and adding the fixed weight.

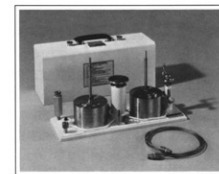
Before using the instrument, the base must be level. A spirit level is permanently mounted on the base plate for this purpose. Operators quickly learn to make repeatable accurate measurements.



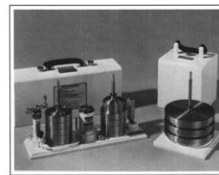
Gauge Series 5



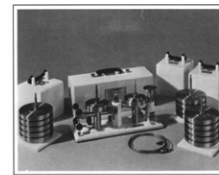
Gauge Series 15



Tester Series 2



Tester Series 23



Tester Series 55

To order, see pages P19, P20 and P21.