TECHNICAL DATA

Fluke Calibration P3100 Hydraulic Deadweight Testers



Key features

- Pressure ranges to 60,000 psi (4000 bar)
- 0.015% of reading accuracy standard (0.008% optional)
- Single or dual piston format
- Built-in hand pumps standard
- Mounted spirit level with adjustable feet
- Units can be trimmed to local gravity FOC

Product overview: Fluke Calibration P3100 Hydraulic Deadweight Testers

The P3100 models are available in single or dual piston format. Unit can be supplied in psi, bar, kgf/cm^2, and MPa. This robust instrument is highly accurate, quick and easy to use. Units feature a built-in priming pump for large volume applications, piston flotation indicators and a high quality screw press for fine pressure control.

Operating principle

Deadweight testers are the high performance pressure standards for pressure measurement. Utilizing the well proven piston-gauge system consisting of a vertically mounted, precision lapped piston and cylinder assembly, accurately calibrated weight masses (Force) are loaded on the piston (Area), which rises freely within its cylinder. These weights

balance the upward force created by the pressure within the system. The pressure is measured when placed on a correctly spinning and floating piston. The total pressure measured is the summation of the weights plus the piston weight carrier assembly.

Instrument base

There are three basic variations in the hydraulic offering; single low pressure, single high pressure and dual piston models. Pressure is generated and controlled by means of a high quality screw press located on the front of the tester. A built-in hand pump is included as standard for all hydraulic models to prime the system and accommodate large volume requirements.

Piston/cylinder assemblies

The piston/cylinder assembly is the heart of each deadweight tester. They are manufactured from materials that provide stability, durability, and low thermal coefficients and distortion. Our experience and knowledge of piston/cylinder production and calibration ensure the precision and performance required for today's demanding calibration requirements.

Weight masses

Standard weight masses are series 3 nonmagnetic austenitic stainless steel. Each mass is marked with the serial number of the instrument and the nominal pressure value relative to the high or low-pressure piston, when applicable. Optional fractional weights are stainless steel and/or solution heat treated aluminum.

Gravity correction

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 calibrated to Standard Gravity at 980.665 cm/s2.

Specifications: Fluke Calibration P3100 Hydraulic Deadweight Testers

Pressure Ranges	
Oil operated	Ranges to 20,000 psi (1400 bar)
Accuracy	
Accuracy[1]	±0.015% of reading (±0.008% optional)
1. 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.	
Materials of Construction	
Standard weight material	Series 3 non-magnetic austenitic stainless steel
Weight density	7.8 g/cm^3
Optional fractional weights	Solution heat treated aluminum
Weight density	2.7 g/cm^3
Piston material	Tungsten carbide with nickel binder Density- 15.0 g/cm^3
Cylinder material	Hardened martensitic steel Tungsten carbide (water above 500 psi, 35 bar)
Thermal coefficients of expansion	Oil piston/cylinder 16.5 ppm/°C Water (above 500 psi, 35 bar) 11 ppm/°C

General	
Test port adaptors	1/8, 1/4, 3/8 and ½ NPT or BSP
Instrument weight	36 lbs (16 kg)
Instrument size (W x D x H)	17.5 x 12 x 8.5
Mass set weight (typical)	80 lbs (36 kg)
Reservoir volume	150 cc
Screw press displacement	5.5 cc
Pump displacement	4.7 cc per stroke
O-ring seal materials	Buna N as standard, Viton and EPDM available
Weight Increments	
Minimum standard weight increments	Up to 500 psi (35 bar): 1 psi (0.1 bar) 500 to 5000 psi (35 to 350 bar): 10 psi (1 bar) 5000 to 20,000 psi (350 to 1400 bar): 20 psi (2 bar) Model P3112: 1 psi (0.1 bar)
Optional fractional weights	Up to 500 psi (35 bar): 0.1 psi (0.01 bar) 500 to 5000 psi (35 to 350 bar): 1 psi (0.1 bar) 5000 to 20,000 psi (350 to 1400 bar): 2 psi (0.2 bar)
Operating Fluid	
Mineral oil	Shell spindle oil 22, our reference 55-655, viscosity 40 cs @ 20°C
Options	
PressCal software	Windows-based software program that allows users to easily apply all necessary corrections to enhance the deadweight tester performance. Calibration details are then stored and/or used to automatically create a calibration certificate. PressCal is provided as standard with all 0.008% instruments.
Fluids	Instruments can be supplied for use with Skydrol or brake fluids. Due to the aggressive nature of these fluids the standard nitrile seals and the acrylic reservoir tube will be replaced by either Viton or EPDM seals (as applicable) and an aluminum reservoir tube. For these or any other specialty fluid applications, please consult the factory.

Ordering information



P3111-KGCM2 / P3111-2

P3111-KGCM2 Hydraulic Deadweight Testers
Pressure range 1 to 35 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3111-BAR / P3111-1

P3111-BAR Hydraulic Deadweight Testers
Pressure range 1 to 35 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3111-PSI / P3111-3

P3111-PSI Hydraulic Deadweight Testers
Pressure range 10 to 500 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3111-KPA / P3111-4

P3111-KPA Hydraulic Deadweight Testers
Pressure range 100 to 3,500 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3111-MPA / P3111-5

P3111-MPA Hydraulic Deadweight Testers
Pressure range 0.1 to 3.5 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3112-BAR / P3112-1

P3112-BAR Hydraulic Deadweight Testers
Pressure range 4 to 140 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3112-KGCM2 / P3112-2

P3112-KGCM2 Hydraulic Deadweight Testers
Pressure range 4 to 140 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3112-PSI / P3112-3

P3112-PSI Hydraulic Deadweight Testers
Pressure range 40 to 2,000 psi

Includes:

- Hydraulic Deadweight Tester

- Oil operated - single PCU

P3112-KPA / P3112-4

P3112-KPA Hydraulic Deadweight Testers
Pressure range 400 to 14,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3112-MPA / P3112-5

P3112-MPA Hydraulic Deadweight Testers
Pressure range 0.4 to 14 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3113-BAR / P3113-1

P3113-BAR Hydraulic Deadweight Testers
Pressure range 10 to 350 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3113-KGCM2 / P3113-2

P3113-KGCM2 Hydraulic Deadweight Testers
Pressure range 10 to 350 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3113-PSI / P3113-3

P3113-PSI Hydraulic Deadweight Testers
Pressure range 100 to 5,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3113-KPA / P3113-4

P3113-KPA Hydraulic Deadweight Testers
Pressure range 1,000 to 35,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3113-MPA / P3113-5

P3113-MPA Hydraulic Deadweight Testers
Pressure range 1 to 35 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3114-BAR / P3114-1

P3114-BAR Hydraulic Deadweight Testers
Pressure range 20 to 700 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3114-KGCM2 / P3114-2

P3114-KGCM2 Hydraulic Deadweight Testers
Pressure range 20 to 700 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3114-PSI / P3114-3

P3114-PSI Hydraulic Deadweight Testers
Pressure range 200 to 10,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3114-KPA / P3114-4

P3114-KPA Hydraulic Deadweight Testers
Pressure range 2,000 to 70,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3114-MPA / P3114-5

P3114-MPA Hydraulic Deadweight Testers
Pressure range 2 to 70 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3115-BAR / P3115-1

P3115-BAR Hydraulic Deadweight Testers
Pressure range 20 to 1,100 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3115-KGCM2 / P3115-2

P3115-KGCM2 Hydraulic Deadweight Testers
Pressure range 20 to 1,100 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3115-PSI / P3115-3

P3115-PSI Hydraulic Deadweight Testers
Pressure range 200 to 16,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3115-KPA / P3115-4

P3115-KPA Hydraulic Deadweight Testers
Pressure range 2,000 to 110,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3115-MPA / P3115-5

P3115-MPA Hydraulic Deadweight Testers
Pressure range 2 to 110 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3116-BAR / P3116-1

P3116-BAR Hydraulic Deadweight Testers
Pressure range 20 to 1,400 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3116-KGCM2 / P3116-2

P3116-KGCM2 Hydraulic Deadweight Testers
Pressure range 20 to 1,400 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3116-PSI / P3116-3

P3116-PSI Hydraulic Deadweight Testers
Pressure range 200 to 20,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3116-KPA / P3116-4

P3116-KPA Hydraulic Deadweight Testers
Pressure range 2,000 to 140,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3116-MPA / P3116-5

P3116-MPA Hydraulic Deadweight Testers
Pressure range 2 to 140 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - single PCU

P3123-BAR / P3123-1

P3123-BAR Hydraulic Deadweight Testers
Pressure range 1 to 350 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3123-KGCM2 / P3123-2

P3123-KGCM2 Hydraulic Deadweight Testers
Pressure range 1 to 350 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3123-PSI / P3123-3

P3123-PSI Hydraulic Deadweight Testers
Pressure range 10 to 5,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3123-KPA / P3123-4

P3123-KPA Hydraulic Deadweight Testers
Pressure range 100 to 35,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3123-MPA / P3123-5

P3123-MPA Hydraulic Deadweight Testers
Pressure range 0.1 to 35 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3124-BAR / P3124-1

P3124-BAR Hydraulic Deadweight Testers
Pressure range 1 to 700 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3124-KGCM2 / P3124-2

P3124-KGCM2 Hydraulic Deadweight Testers
Pressure range 1 to 700 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3124-PSI / P3124-3

P3124-PSI Hydraulic Deadweight Testers
Pressure range 10 to 10,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3124-KPA / P3124-4

P3124-KPA Hydraulic Deadweight Testers
Pressure range 100 to 70,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3124-MPA / P3124-5

P3124-MPA Hydraulic Deadweight Testers
Pressure range 0.1 to 70 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125-BAR / P3125-1

P3125-BAR Hydraulic Deadweight Testers
Pressure range 1 to 1,100 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125-KGCM2 / P3125-2

P3125-KGCM2 Hydraulic Deadweight Testers
Pressure range 1 to 1,100 kgf/cm^2

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125-PSI / P3125-3

P3125-PSI Hydraulic Deadweight Testers
Pressure range 10 to 16,000 psi

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125-KPA / P3125-4

P3125-KPA Hydraulic Deadweight Testers
Pressure range 100 to 110,000 kPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125-MPA / P3125-5

P3125-MPA Hydraulic Deadweight Testers
Pressure range 0.1 to 110 MPa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125XT-BAR

P3125XT-BAR Hydraulic Deadweight Tester
Pressure Range 1 to 1,200 bar

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

P3125XT-MPA

P3125XT-MPA Hydraulic Deadweight Tester
Pressure range 1 to 120 Mpa

Includes:

- Hydraulic Deadweight Tester
- Oil operated - dual PCU

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