Hydraulic Deadweight Tester Model CPB5800

DH·Budenberg

Data Sheet CPB5800 • 12/2012

Applications

- Primary standard for pressure ranges up to 20,000 psi hydraulic
- Pressure reference / calibration standard used in production and calibration laboratories for testing, adjusting and calibrating pressure instruments
- Complete, stand-alone system, suitable for field use

Special features

- Total measurement uncertainty to 0.006 % of measured value
- Dual-range piston-cylinder system for automated range change
- Factory calibration includes traceability to NIST
- Long-term stability with recommended recalibration every five years
- Optional piston-cylinder replacement system via patented ConTect quick-release system

Model CPB5800 deadweight tester

Description

Proven primary standard

Deadweight testers are the most accurate instruments available on the market for the calibration of pressure measuring instruments. Measurement of pressure is accomplished directly by measuring the force applied over an area. This is definition of pressure, expressed by the formula (p = F/A). High-quality materials and tight tolerances incorporated in the CPB5800 ensure small measurement uncertainty, and a long-term stability of five years.

Deadweight testers have been the pressure standard of choice for years in manufacturing, calibration laboratories, national institutes and research laboratories.

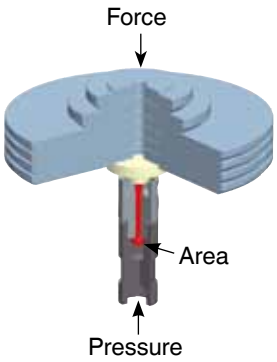
Stand-alone operation

Integrated pressure generation and the fundamental mechanical measuring principle requiring no electrical input, make the model CPB5800 ideal for field maintenance and service applications.

Basic principle

Pressure is defined as the quotient of force and area. The core component of the CPB5800 is precisely-manufactured piston-cylinder system, which is loaded with masses in order to generate the individual test points.

The masses applied are proportional to the target pressure. Masses are manufactured to standard gravity (9.80665 m/s^2), but can be adjusted to gravity at a specific location. Masses are are traceable to NIST.



WIKA
Part of your business

The model CPB5800 instrument base

Easy operation
Pressure devices with large volumes are easily filled and pressurized with the integrated priming and spindle pump. A 250 ml reservoir the instrument base holds the fill fluid. Fine adjustments can also be precisely controlled with the spindle pump, which runs within the pump body.
As soon as the measuring system reaches equilibrium, there is a balance of forces between the pressure and the mass load applied. The system ensures that this pressure remains stable over several minutes, so that the pressure value for can be read, or complex adjustments can be carried out.

High-performance instrument range
The CPB5800 instrument base is available in 2 variants:

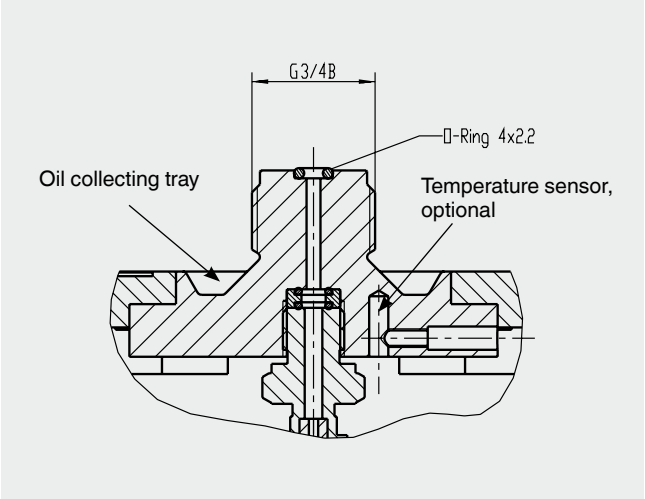
- Standard hydraulic base
  - up to max. 16,000 psi /1,200 bar
  - with integrated pressure generation through priming pump and spindle pump
  - Standard pressure transmission medium: mineral oil, optional: Sebacate oil, brake fluid, Skydrol, Fomblin oil or water

- Hydraulic high-pressure base
  - up to max. 20,000 psi/1,400 bar
  - with integrated pressure generation through priming pump and spindle pump
  - Pressure transmission medium: mineral oil or Sebacate oil

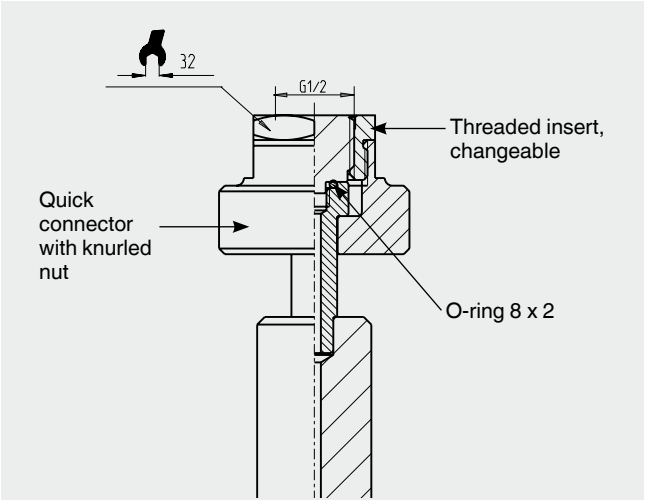
Both instruments bases are fitted with a connection for the piston-cylinder system with G ¾ male thread.
With the 16,000 psi / 1,200 bar instrument base, the patented ConTect quick-release mechanism is available as an option. This enables the piston-cylinder system to be changed quickly and safely without any tools.

The connection of the test item is also made without tools, using a quick-connection. Via the freely-rotating knurled nut, the test item can be oriented as required. A threaded insert with a ½ NPT female thread is provided. Other threaded inserts are available to connect the most common pressure measuring instruments.

Standard connection piston-cylinder system



Test item connection



The model CPS5800 piston-cylinder system

The CPS5800 piston-cylinder systems are available in two fundamentally different designs, depending on measuring range.

- Single-range piston-cylinder system for measuring ranges 1600 psi(120 bar) and 4000 psi (300 bar)
- Dual-range piston-cylinder system for measuring ranges 10,000 psi (700 bar), 16,000 psi (1,200 bar) and 20,000 psi (1,400 bar)

High accuracy over a wide measuring range

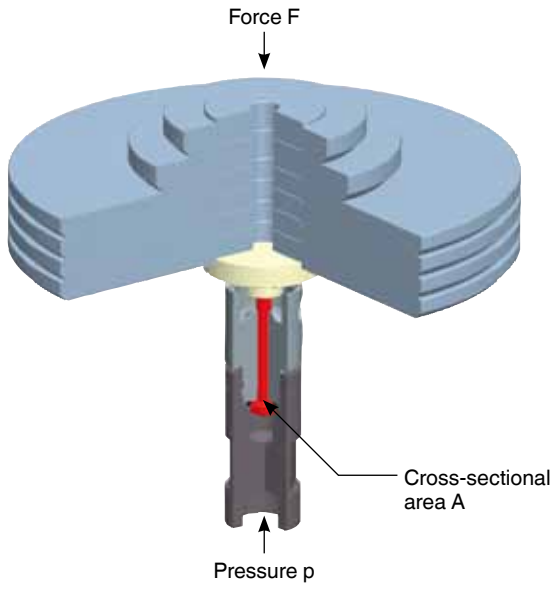
The dual-range piston-cylinder system offers two measuring ranges in one housing with automatic switching from low-pressure to high-pressure pistons. This provides an extremely flexible measuring instrument covering a wide range at high accuracy, using one piston-cylinder and one set of weights. Additionally, two test points can automatically be achieved with one set of masses.

The piston and cylinder are manufactured from hardened steel and tungsten carbide, respectively. Together these materials have a low coefficient of expansion with respect to pressure and temperature. This results in a very good linearity for the cross-sectional area and a very high accuracy.

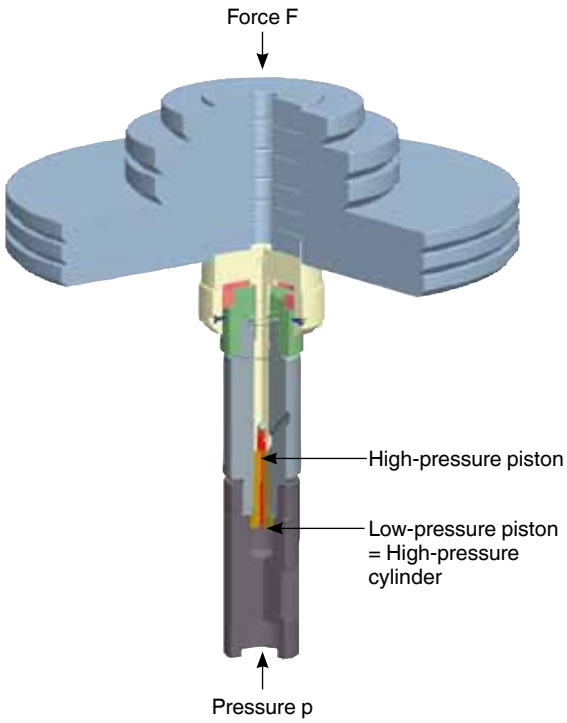
The piston and cylinder are protected against contact, impacts or contamination from outside, in a solid stainless-steel/hardened tool steel housing. Integrated overpressure protection prevents the piston from being forced out vertically, avoiding damage to the piston-cylinder system in the event of mass removal under pressure.

The masses are stacked directly onto the piston-cylinder shaft. This makes it easier for the operator to place the masses and enables a lower initial pressure value.

The overall design of the piston-cylinder unit and the precise tolerances of both the piston and the cylinder, ensure exceptionally low friction force, which results in excellent operating characteristics with long free-rotation time and low sink rates. Thus, a high long-term stability is ensured. The recommended recalibration interval is 5 years depending on the conditions of usage.



Model CPS5800 single-range piston-cylinder system



Model CPS5800 dual-range piston-cylinder system

The model CPM5800 mass set

The standard mass set is supplied in a wooden case with a closed cell foam insert. This includes the masses listed in the tables of masses below, made from non-magnetic stainless steel, and optimized for everyday use. For finer increments and for a higher resolution, the standard mass sets can be extended by an optional set of fine increment weights. If even smaller intermediate values need to be generated, use of a trim-mass sets from the accessories is recommended.

Mass set model CPM5800

Tables of masses

The following tables show the number of masses and their nominal pressure range for each mass set.

Masses are manufactured to produce the nominal pressure under standard reference conditions (ambient temperature 20 °C, air pressure 29.9213 in-Hg, 0 °C, relative humidity 40 %). Corrections must be applied for measurements taken under other conditions. CPU5000 CalibratorUnit is made to automatically adjust for relevant environmental conditions, see page 11.

The masses are manufactured to standard gravity (9.80665 m/s^2) although they can be adjusted for any particular location.

The mass sets can be manufactured for the following different pressure units, psi, bar, kg/cm^2, kPa, or MPa and can be used with the same piston-cylinder system.

Measuring range [psi] or [lb/in²]	Single-piston measuring ranges				Dual-piston measuring ranges								
	10 … 1,600		30 … 4,000		10 … 10,000			10 … 16,000			10 … 20,000		
					10 … 800	100 … 10,000		10 … 800	200 … 16,000		10 … 800	200 … 20,000	
	Quantity	Nominal pressure per piece [psi] [lb/in²]	Quantity	Nominal pressure per piece [psi] [lb/in²]	Quantity	Nominal pressure per piece [psi] [lb/in²]	Nominal pressure per piece [psi] [lb/in²]	Quantity	Nominal pressure per piece [psi] [lb/in²]	Nominal pressure per piece [psi] [lb/in²]	Quantity	Nominal pressure per piece [psi] [lb/in²]	Nominal pressure per piece [psi] [lb/in²]
Piston	1	10			1	10	100	1	10	200	1	10	200
Piston and make-up weight			1	30									
Standard mass set	6	200	6	500	8	100	1,000	6	100	2,000	8	100	2,000
	1	180	1	450	1	90	900	1	90	1,800	1	90	1,800
	1	100	1	250	1	50	500	1	50	1,000	1	50	1,000
	2	40	2	100	2	20	200	2	20	400	2	20	400
	1	20	1	50	1	10	100	1	10	200	1	10	200
	2	10	1	25	1	5	50	1	5	100	1	5	100
	1	5	1	20									
Fine increment weights (optional)	1	4	2	10	2	2	20	2	2	40	2	2	40
	1	2	1	5	1	1	10	1	1	20	1	1	20
	1	1	1	2.5	1	0.5	5	1	0.5	10	1	0.5	10
	2	0.4	2	1	2	0.2	2	2	0.2	4	2	0.2	4
	1	0.2	1	0.5	1	0.1	1	1	0.1	2	1	0.1	2

Measuring range [bar] or [kg/cm²]	Single-piston measuring ranges				Dual-piston measuring ranges									
	1 … 120		2 … 300		1 … 700			1 … 1,200			1 … 1,400			
					1 … 60		10 … 700	1 … 60		20 … 1,200	1 … 60		20 … 1,400	
	Quantity	Nominal pressure per piece [bar] [kg/cm²]	Quantity	Nominal pressure per piece [bar] [kg/cm²]	Quantity	Nominal pressure per piece [bar] [kg/cm²]	Nominal pressure per piece [bar] [kg/cm²]	Quantity	Nominal pressure per piece [bar] [kg/cm²]	Nominal pressure per piece [bar] [kg/cm²]	Quantity	Nominal pressure per piece [bar] [kg/cm²]	Nominal pressure per piece [bar] [kg/cm²]	
Piston and make-up weight	1	1	1	2	1	1	10	1	1	20	1	1	20	
Standard mass set	4	20	4	50	5	10	100	4	10	200	5	10	200	
	1	18	1	45	1	9	90	1	9	180	1	9	180	
	1	10	1	25	1	5	50	1	5	100	1	5	100	
	2	4	2	10	2	2	20	2	2	40	2	2	40	
	1	2	1	5	1	1	10	1	1	20	1	1	20	
	2	1	1	3	1	0.5	5	1	0.5	10	1	0.5	10	
	1	0.5	1	2.5										
Fine increment weights (optional)	1	0.4	2	1	2	0.2	2	2	0.2	4	2	0.2	4	
	1	0.2	1	0.5	1	0.1	1	1	0.1	2	1	0.1	2	
	1	0.1	1	0.25	1	0.05	0.5	1	0.05	1	1	0.05	1	
	2	0.04	2	0.1	2	0.02	0.2	2	0.02	0.4	2	0.02	0.4	
	1	0.02	1	0.05	1	0.01	0.1	1	0.01	0.2	1	0.01	0.2	

Measuring range [kPa]	Single-piston measuring ranges				Dual-piston measuring ranges									
	100 … 12,000		200 … 30,000		100 … 70,000			100 … 120,000			100 … 140,000			
					100 … 6,000		1.000 … 70,000	100 … 6,000		2,000 … 120,000	100 … 6,000		2,000 … 140,000	
	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Nominal pressure per piece [kPa]	
Piston and make-up weight	1	100	1	200	1	100	1,000	1	100	2,000	1	100	2,000	
Standard mass set	4	2,000	4	5,000	5	1,000	10,000	4	1,000	20,000	5	1,000	20,000	
	1	1,800	1	4,500	1	900	9,000	1	900	18,000	1	900	18,000	
	1	1,000	1	2,500	1	500	5,000	1	500	10,000	1	500	10,000	
	2	400	2	1,000	2	200	2,000	2	200	4,000	2	200	4,000	
	1	200	1	500	1	100	1,000	1	100	2,000	1	100	2,000	
	2	100	1	300	1	50	500	1	50	1,000	1	50	1,000	
	1	50	1	250										
Fine increment weights (optional)	1	40	2	100	2	20	200	2	20	400	2	20	400	
	1	20	1	50	1	10	100	1	10	200	1	10	200	
	1	10	1	25	1	5	50	1	5	100	1	5	100	
	2	4	2	10	2	2	20	2	2	40	2	2	40	
	1	2	1	5	1	1	10	1	1	20	1	1	20	

Scope of delivery

- Base with dust protection cover
- Priming pump
- Spindle pump for pressure generation and fine adjustment
- Piston connection with G ¾ male thread
- Quick connector for test items with ½ NPT female threaded insert, changeable
- Piston-cylinder system
- Standard mass sets in carrying case
- Set of masses manufactured to standard gravity (9.80665 m/s²)
- VG22 mineral oil (1.0 litre)
- Operating instructions in English and German language
- Calibration certificate

Options

- Other pressure transmission media
- Piston connection with ConTect quick-release connector
- System with increased accuracy to 0.006 %
- Other pressure units
- Set of masses manufactured to local gravity
- Fine increment weights
- Storage case for the base and the piston-cylinder system
- NIST traceable or DKD/DAkkS or UKAS calibration certificate

Model CPS5800 piston-cylinder systems

Version		Single-piston measuring ranges		Dual-piston measuring ranges		
Measuring range [1]	psi, lb/in²	10 … 1,600	30 … 4,000	10 … 800 / 100 … 10,000	10 … 800 / 200 … 16,000	10 … 800 / 200 … 20,000
Required masses	kg	45.5	45.3	56.4	45	56.4
Smallest step [2] (Standard mass sets)	psi, lb/in²	5	20	5 / 50	5 / 100	5 / 100
Smallest step [3] (fine increment weights)	psi, lb/in²	0.2	0.5	0.1 / 1	0.1 / 2	0.1 / 2
Nominal cross-sectional area of the piston	cm²	0.4032	0.1613	0.8065 / 0.0807	0.8065 / 0.0403	0.8065 / 0.0403
Measuring range [1]	bar, kg/cm²	1 … 120	2 … 300	1 … 60 / 10 ... 700	1 … 60 / 20 … 1,200	1 … 60 / 20 … 1,400
Required masses	kg	49.7	49.6	57.4	49.2	57.4
Smallest step [2] (Standard mass sets)	bar, kg/cm²	0.5	2.5	0.5 / 5.0	0.5 / 10	0.5 / 10
Smallest step [3] (fine increment weights)	bar, kg/cm²	0.02	0.05	0.01 / 0.1	0.01 / 0.2	0.01 / 0.2
Nominal cross-sectional area of the piston	cm²	0.4032	0.1613	0.8065 / 0.0807	0.8065 / 0.0403	0.8065 / 0.0403
Measuring range [1]	kPa	100 … 12,000	200 … 30,000	100 … 6,000 / 1,000 … 70,000	100 … 6,000 / 2,000 … 120,000	100 … 6,000 / 2,000 … 140,000
Required masses	kg	49.7	49.6	57.4	49.2	57.4
Smallest step [2] (Standard mass sets)	kPa	50	250	50 / 500	50 / 1,000	50 / 1,000
Smallest step [3] (fine increment weights)	kPa	2	5	1 / 10	1 / 20	1 / 20
Nominal cross-sectional area of the piston	cm²	0.4032	0.1613	0.8065 / 0.0807	0.8065 / 0.0403	0.8065 / 0.0403
Accuracies						
Standard [4] [5]	% of measured value	0.015	0.015	0.015	0.015	0.025
Premium [4] [5]	% of measured value	0.007	0.006	0.006	0.007	0.007
Pressure transmission medium						
Standard		Hydraulic fluid based on VG22 mineral oil				
Optional		Sebacate oil Brake fluid Skydrol Fomblin oil Water	Sebacate oil Brake fluid Skydrol Fomblin oil Water	Sebacate oil Brake fluid Skydrol Fomblin oil Water	Sebacate oil Brake fluid Skydrol Fomblin oil	Sebacate oil
Material						
Piston		Steel	Steel	Tungsten carbide / steel	Tungsten carbide / steel	Tungsten carbide / steel
Cylinder		Bronze	Steel	Steel / tungsten carbide	Steel / tungsten carbide	Steel / tungsten carbide
Mass set		Stainless steel, non-magnetic				
Weight						
Piston-cylinder system	lbs. (kg)	2.2 (1)	1.8 (0.8)	4.4 (2)	4.4 (2)	4.4 (2)
Storage case for piston-cylinder system	lbs. (kg)	6.8 (3.1)				
BAR standard mass sets (in 2 wooden cases)	lbs. (kg)	135 (61.3)	135 (61.3)	152 (69)	134 (60.8)	152 (69)
PSI standard mass sets (in 2 wooden cases)	lbs. (kg)	126 (57.1)	125 (56.9)	150 (68)	125 (56.6)	150 (68)
BAR fine increment weights	lbs. (kg)	0.7 (0.33)	1.1 (0.5)	1.1 (0.5)	1.1 (0.5)	1.1 (0.5)
PSI fine increment weights	lbs. (kg)	0.5 (0.23)	0.7 (0.34)	0.7 (0.34)	0.7 (0.34)	0.7 (0.34)
Dimensions						
Carrying case for standard mass sets	in. (mm)	15.75 x 12.2 x 12.2 in (400 x 310 x 310 mm) (W x H x D)				
Storage case for piston-cylinder systems (optional)	in. (mm)	11.8 x 10.43 x 8 in. (300 x 265 x 205 mm) (W x H x D)				

1) Theoretical starting value; corresponds to the pressure value generated by the piston or the piston and its make-up weights (by their own weight). To optimize the operating characteristics more weights should be loaded.
2) The smallest pressure change value that can be achieved based on the standard weight set. To reduce this, a set of trim masses is also available.
3) The smallest pressure change value that can be achieved based on the optional fine increment weights. For further reductions, an accessory of class M1 or F1 trim masses is available.
4) The accuracy from 10 % of the measuring range is based on the measured value. In the lower range, a fixed error based on 10 % of the range applies.
5) Measurement uncertainty assuming reference conditions (ambient temperature 20 °C, air pressure 1013 mbar, relative humidity 40 %). For operation without a CalibratorUnit, corrections must be made if required.

Model CPB5800 base

Base version	
Hydraulic standard	up to a max. 16,000 psi / 1,200 bar; with internal pressure generation
Hydraulic high-pressure	up to a max. 20,000 psi / 1,400 bar; with internal pressure generation
Pressure transmission medium	
Standard	Hydraulic fluid based on VG22 mineral oil
Optional	Sebacate oil, brake fluid, Skydrol, Fomblin oil or water (dependant upon measuring range)
Oil reservoir	250 cm^3
Connections	
Connection for piston-cylinder system	G ¾ male / optional: ConTect quick-release connector (not for 20,000 psi version)
Test item connector	½ NPT female quick connector as standard, freely rotating, changeable (for other threaded inserts, see accessories)
Material	
Tubing in instrument base	1.4404 stainless steel, 6 x 2 mm
Weight	
Standard hydraulic base	40 lbs. / 18.0 kg or 41 lbs. / 19.0 kg (incl. optional ConTect quick-release connector)
Hydraulic high-pressure base	40lbs. / 18.0 kg
Storage case for the base	19 lbs. / 8.5 kg
Permissible ambient conditions	
Operating temperature	64 ... 82°F / 18 ... 28 °C
Dimensions	
Base	15.75 x 14.75 x 10.43 in. / 400 x 375 x 265 mm (W x D x H), for details, see technical drawings

Approvals and certificates

CE conformity	
Pressure equipment directive	97/23/EC (Module A)
Certificate	
Calibration	NIST Traceable calibration certificate Option: DKD/DAkkS calibration certificate or UKAS calibration certificate

Transport dimensions for complete instrument

The complete instrument, in its standard version and standard scope of delivery, consists of 3 packages on a single pallet.
The dimensions are 47.5 x 31.5 x 19.7 inches - (1,200 x 800 x 500 mm.)
The overall weight is dependant on the measuring range

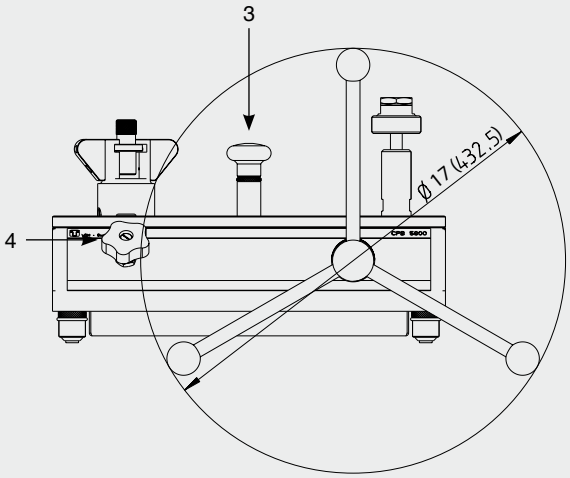
	Weight in lbs.	
Version in psi	**net**	**gross**
Single-piston measuring ranges		
10 … 1.600 psi	170	211
30 … 4.000 psi	170	210
Dual-piston measuring ranges		
10 … 800 psi / 100 … 10.000 psi	196	236
10 … 800 psi / 200 … 16.000 psi	170	211
10 … 800 psi / 200 … 20.000 psi	196	236

	Weight in kg	
Version in bar	**net**	**gross**
Single-piston measuring ranges		
1 … 120 bar	81.5	100
2 … 300 bar	81.5	100
Dual-piston measuring ranges		
1 … 60 bar / 10 … 700 bar	90	108.5
1 … 60 bar / 20 … 1.200 bar	82	100.5
1 … 60 bar / 20 … 1.400 bar	90	108.5

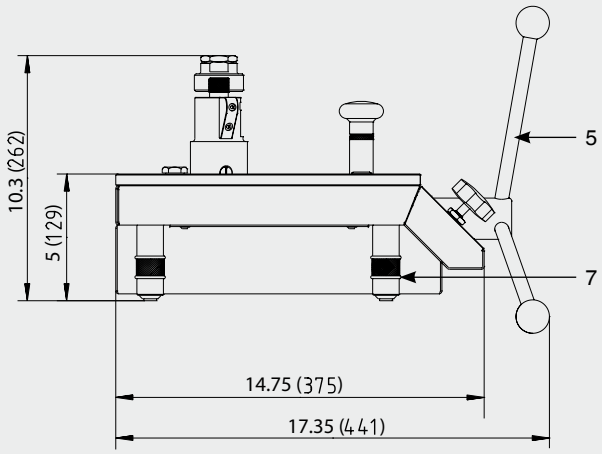
Dimensions in Inches (mm)

The picture shows a 16,000 psi version of the CPB5800 instrument base with the ConTect quick-release connector option. The 20,000 psi high-pressure version does not differ from it dimensionally, only in the arrangement of the control elements.

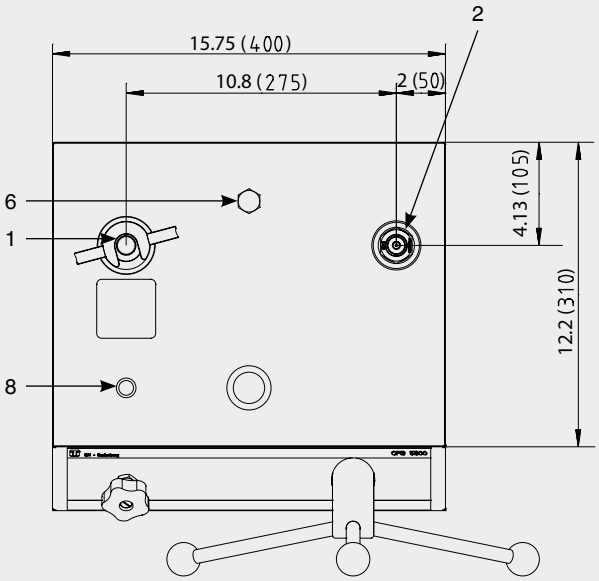
Front view



Side view



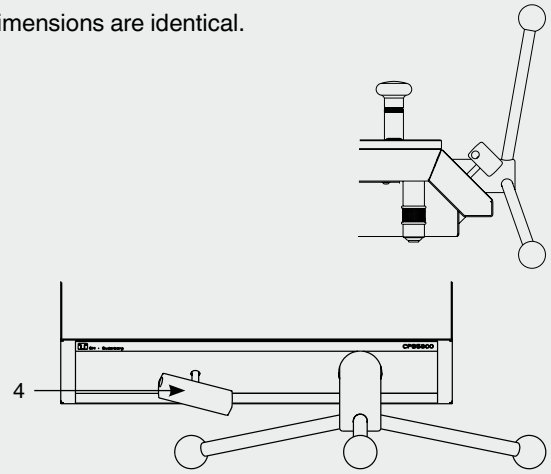
Top view



Detailed section view
20,000 psi high-pressure version

- with high-pressure shut-off valve
- no ConTect quick-release connector possible

Dimensions are identical.



(1) Connector for piston-cylinder system
(2) Test item connection
(3) Priming pump
(4) Outlet valve
(5) Spindle pump with star handle, removable
(6) Oil reservoir sealing screw
(7) Rotatable feet
(8) Level

Additional deadweight testers within the calibration technology program

Model CPB3800 deadweight tester

Measuring ranges:

- Hydraulic 10 ... 1,600 up to 100 ... 16,000 psi, or
  1 ... 120 up to 10 ... 1,200 bar

Accuracy: 0.05 % of measured value
0.025 % of measured value (optional)

Model CPB3800 deadweight tester

Model CPB5000 pneumatic deadweight tester

Measuring ranges:

- Pneumatic -0.435 … -14 up to +5.8 … +1,500 psi or
  -0.03 ... -1 up to +0.4 ... +100 bar

Accuracy: 0.015 % of measured value
0.008 % of measured value (optional)

Model CPB5000 deadweight tester

Model CPB5000HP deadweight tester for high pressure

Measuring ranges:

- Hydraulic 350 ... 40.000, 350 ... 60.000
  350 ... 70.000 psi, or
  25 ... 2.500, 25 ... 4.000 or 25 ... 5.000 bar

  600 / 40,000 psi dual piston or
  50 / 2,600 bar dual piston

Accuracy: 0.025 % of measured value
0.02 % of measured value (optional)

Model CPB5000HP deadweight tester for high pressure

Model CPB5000DP deadweight tester for differential pressure

Measuring range = (static pressure + differential pressure):

- Pneumatic 0.435 … 30 up to 5.8 … 1,500 psi or
  0.03 … 2 up to 0,4 … 100 bar

- Hydraulic 2.9 … 1,000 up to 29 … 14,500 psi or
  0.2 … 60 up to 2 … 1,000 bar

Accuracy: 0.015 % of measured value
0.008 % of measured value (optional)

Model CPB5000DP deadweight tester for differential pressure

Accessories

Trim-mass sets
The weights included in the CPM5800 standard mass set or fine increment weights are ideally suited for everyday use. If smaller intermediate values need to be generated, we recommend using a set of trim masses, with the following weights:

1 x 50 g, 2 x 20 g, 1 x 10 g, 1 x 5 g, 2 x 2 g, 1 x 1 g,
1 x 500 mg, 2 x 200 mg, 1 x 100 mg, 1 x 50 mg, 2 x 20 mg,
1 x 10 mg, 1 x 5 mg, 2 x 2 mg, 1 x 1 mg

Set of trim masses

Set of adapters for quick connector
The deadweight tester is equipped with a quick connector for connecting test items. Various threaded adapters are available:

- Adapter set NPT: ⅛ NPT, ¼ NPT, ⅜ NPT and ½ NPT
- Adapter set: G ¼, G ⅜, ½ NPT, ¼ NPT and M20 x 1.5

Additionally the sets of adapters include spare O-rings as well as a wrench for changing the adapters.
Other threaded inserts are available on request.

Set of adapters

Separator
The separators have been specifically designed for measuring instruments, which should not come into contact with the medium of the deadweight tester or to protect against contamination of the deadweight tester from the test items.

Fig. left: Separator (without diaphragm)
Fig. middle: Separator (with diaphragm) 10,000 psi
Fig. right: Separator (with diaphragm) 16,000 psi

Accessories	Order no.
Set of trim masses (1 mg up to 50 g), class F1	7093874
Set of trim masses (1 mg up to 50 g), class M1	14025325
Set of adapters for quick connector in case with G ¼, G ⅜, ½ NPT, ¼ NPT and M20 x 1.5 threaded inserts for insertion in the knurled nut on the test item connector	2036941
Set of "NPT" adapters for quick connector in case with ⅛ NPT, ¼ NPT, ⅜ NPT and ½ NPT threaded inserts for insertion in the knurled nut on the test item connector	12563626
90° angle connection, for test items with back mounting connection	1564838
Separator (without diaphragm), max. 14,000 psi	1565389
Separator (to separate two liquid media by a diaphragm), max. 10,000 psi	14031253
Separator (to separate two liquid media by a diaphragm), max. 16,000 psi	14031254
O-ring set consisting of 5 pcs. 8 x 2 and 5 pcs. 4 x 2.2	12328562
Operating fluid for CPB series up to a max. 58,000 pis, 1 litre	2099882
Adapter for mounting model CPS5800 hydraulic piston-cylinder systems into a ConTect system mechanism	14031252
Test item connecting piece, G 3/4 female to G 1/2 female, free-rotating, operation as a comparison test pump is possible	14031251
Special test-item adapter with quick connect, for the matching to the ConTect system mechanism, operation as a comparison test pump is possible	2152634
Electrical piston drive unit for 14,000 psi, 16,000 psi and 20,000 psi measuring ranges (AC 230 V/50 Hz)	14031260

Model CPU5000 CalibratorUnit

The CPU5000 CalibratorUnit is a compact tool for use with a deadweight tester, when measurement uncertainties of less than 0.025 %, are required. With the CPU5000 Sensor Package, all critical ambient parameters are sensed and corrections factors are automatically adjusted.

CPU5000 basic package
The basic CalibratorUnit package converts masses into the corresponding pressure value, or vice versa, it calculates the masses required for a specific pressure value with consideration to the local gravity, for location-independent measurements. The conversion can be carried out in all common pressure units. The input of all parameters takes place manually.

Sensor package
The "sensor package" extension includes sensors to automatically register all critical parameters such as room temperature, air pressure, relative humidity and piston temperature and to update calculations continually.

Multimeter package
With the multimeter package, a calibrator function for pressure transmitters can be integrated. With this, the sensor to be tested can be supplied with a DC 24 V voltage and the output signal (V, mA) can be measured. The output signal, and the pressure value are automatically shown on the display.

Piston position display
With the extension for "piston position indication", the piston position can be measured (contact free) and shown on the CalibratorUnit with high resolution (not available for dual-range piston-cylinder systems)..

Model CPB5800 deadweight tester with model CPU5000 CalibratorUnit

Model CPU5000 Calibrator Unit

Accessories

CPU5000 base packet (processor only)
- Calculation of the mass loads
- Manual input of all parameters

Sensor package for measuring of:
- Ambient temperature
- Atmospheric pressure
- Humidity
- Cylinder temperature

Multimeter package
- Voltage supply, DC 24 V
- Measurement of output signal (V, mA) incl. conversion into pressure values

Piston position display
- Contact-free measuring of piston position

Ordering information

Instrument base
CPB5800 / Pressure medium / Version / Connection of piston-cylinder system / Piston-cylinder system / Mass set / Storage box / Additional order details

Piston-cylinder system
CPS5800 / Accuracy / Gravity value g / Measuring range / Connection for piston-cylinder system / Carrying case for piston-cylinder system / Calibration for piston-cylinder system / Additional order details

Mass set
CPM5800 / Pressure unit / Gravity value g / Standard mass set / Fine increment weights / Calibration for standard mass set / Calibration for fine increment weights / Additional order details

Model CPU5000 Mass Set

Model CPB5000 Deadweight Tester

The specifications given in this document represent the state of engineering at the time of publishing.
We reserve the right to make modifications to the specifications and materials.

DH-Budenberg
201 Barnes Drive
San Marcos, Texas 78666
Tel. 512.396.4200
Fax 512.396.1820
E-mail sales@mensor.com
www.mensor.com