

# Dead-weight tester, pneumatic version Vacuum to 120 bar [1,600 lb/in<sup>2</sup>] Model CPB3500



WIKA data sheet CT 31.22

## Applications

- Primary standard for calibrating the pressure scale in a pneumatic range from -1 ... 120 bar [-14.5 ... 1,600 lb/in<sup>2</sup>]
- Reference instrument for factory and calibration laboratories for the testing, adjustment and calibration of pressure measuring instruments
- Complete, stand-alone system, also suitable for on-site use

## Special features

- Total measurement uncertainty starting from 0.015 ... 0.006 % of reading
- Four different piston-cylinder systems available for ranges  $\pm 1$  bar, 0.1 ... 7 bar, 0.2 ... 25 bar, 1 ... 70 bar and 1 ... 120 bar, or also for ranges in lb/in<sup>2</sup> and kPa
- Stable aluminium base with a strong impact-resistant ABS cover for heavy industrial use combined with compact dimensions and light weight
- Interchangeable pistons and mass sets for each model, mass sets manufactured from stainless steel
- Factory calibration included as standard, traceable to national standards; with UKAS calibration possible as an option



Dead-weight tester, pneumatic version,  
model CPB3500

## Description

### Proven primary standard

The model CPB3500 dead-weight tester is a genuine primary standard, which derives the measurement of pressure directly from its fundamental equation  $p = F/A$ . This mechanical measuring principle provides superior reliability and stability over time, eliminates most risks of measurement error and reduces calibration uncertainties. Thus the CPB3500 is the ideal tool for the calibration of any type of pressure measuring instruments on a daily basis.

### Robustness and modularity

The instrument is built on a tough, stable aluminium base with high corrosion resistance and impact-resistant ABS case.

Piston cylinders are interchangeable among the various models within the CPB3500 series, so that in case of changing requirements any CPB3500 model can easily be upgraded on other available ranges. Mass sets are fully interchangeable between pistons of the same range within the claimed standard accuracy. The mass set is made of non-magnetic stainless steel so that masses remain extremely stable over time. Bases can also be quickly converted into a comparator by substituting the suitable transfer standard for the piston and mass set.

## Easy to use

Two built-in precision soft seat valves combined with a volume adjuster provide fine pressure control capability. The safety pressure gauge on the base displays the approximate pressure. The masses are top loading (except for the 25 bar [400 lb/in<sup>2</sup>] range) to enable easier and faster operation. They are available in the most common pressure units.

The mass load is proportional to the target pressure and this is achieved through optimally graduated masses. As standard, these masses are manufactured to the standard gravity (9.80665 m/s<sup>2</sup>), though they can be adjusted to a specific location and also UKAS calibrated.

## The piston-cylinder system

Both the piston and cylinder are manufactured from materials with exceptionally low pressure and temperature coefficients. This leads to a high linearity of the effective area of the piston and results in a high measurement accuracy.

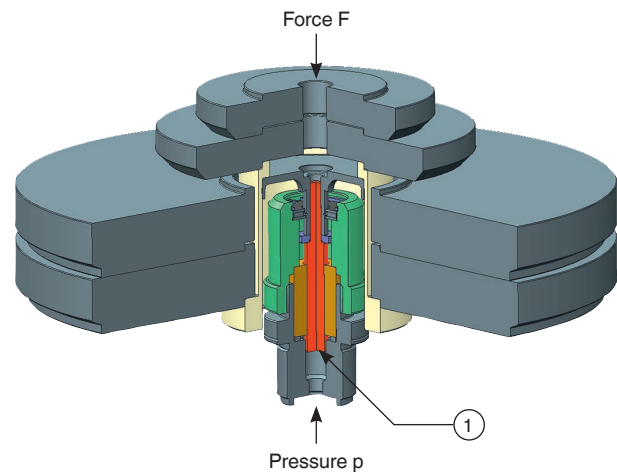
An integrated overpressure protection prevents the piston from being forced out vertically and thus avoids damage to the piston-cylinder system in the event of the removal of masses under pressure.

Piston and cylinder must only be operated with clean air/gas. The exceptions are the 70 bar [1,000 lb/in<sup>2</sup>] and 120 bar [1,600 lb/in<sup>2</sup>] ranges where the piston-cylinder system is oil-lubricated.

The masses are stacked on the piston-cylinder system - with the exception of the 25 bar [400 lb/in<sup>2</sup>] range, where the annular masses are stacked on a mass carrier, so as to have minimum side thrust and friction on the piston-cylinder system.

The entire construction design of the piston-cylinder system and the very precise manufacturing of both the piston and the cylinder ensure excellent operating characteristics with a long free-rotation time, low sink rates and a very high long-term stability. Therefore, the recommended calibration interval is two to five years dependent on the conditions of use.

As standard, all instrument bases are equipped with a G 1, female thread as connection for the piston-cylinder system.



**Piston-cylinder system model CPS3500**

① Effective area A

## Tables of masses

The following tables show the number of masses within a mass set with their nominal mass values and the resulting nominal pressures for the respective measuring ranges.

Should the instrument not be operated under reference conditions (ambient temperature 20 °C [68 °F], atmospheric pressure 1,013 mbar [14.69 lb/in<sup>2</sup>], relative humidity 40 %), the measured values must be corrected arithmetically.

For the measurement of the ambient conditions, the CPU6000 CalibratorUnit can be used, see page 9.

The masses are manufactured, as standard, to the standard gravity of 9.80665 m/s<sup>2</sup>, although they can also be adjusted for any local gravity.

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

Measuring range [bar] <sup>1)</sup>	0.015 ... 1		0.015 ... 2		0.1 ... 7		0.2 ... 25		1 ... 70		1 ... 120	
	Quantity	Nominal pressure per piece [mbar]	Quantity	Nominal pressure per piece [mbar]	Quantity	Nominal pressure per piece [bar]	Quantity	Nominal pressure per piece [bar]	Quantity	Nominal pressure per piece [bar]	Quantity	Nominal pressure per piece [bar]
<b>Piston and make-up weight</b>	1	0.015	1	0.015	1	0.1	1	0.2	1	1	1	1
<b>Standard mass set</b>	1	0.005	1	0.005	1	0.4	1	0.3	2	1	2	1
	3	0.02	3	0.02	2	0.5	1	4.5	5	10	1	18
	2	0.01	2	0.01	5	1	3	5	1	9	4	20
	6	0.05	6	0.05	2	0.2	2	2	2	4	1	10
	6	0.1	6	0.1	1	0.1	1	1	1	2	2	4
	-	-	1	1	1	0.05	1	0.5	1	0.5	1	2
	-	-	-	-	-	-	-	-	-	-	1	0.5
<b>Set of fine increment masses (optional)</b>	-	-	-	-	2	0.02	2	0.2	1	0.4	1	0.4
	-	-	-	-	1	0.01	1	0.1	1	0.2	1	0.2
	-	-	-	-	1	0.005	1	0.05	1	0.1	1	0.1
	-	-	-	-	-	-	2	0.02	2	0.04	2	0.04
	-	-	-	-	-	-	1	0.01	1	0.02	1	0.02

1) Other ranges like "in. water column" and "mm. water column" also available on request.

Measuring range [lb/in <sup>2</sup> ] <sup>1)</sup>	0.2 ... 15		0.2 ... 30		1 ... 100		3 ... 400		15 ... 1,000		10 ... 1,600	
	Quantity	Nominal pressure per piece [lb/in <sup>2</sup> ]	Quantity	Nominal pressure per piece [lb/in <sup>2</sup> ]	Quantity	Nominal pressure per piece [lb/in <sup>2</sup> ]	Quantity	Nominal pressure per piece [lb/in <sup>2</sup> ]	Quantity	Nominal pressure per piece [lb/in <sup>2</sup> ]	Quantity	Nominal pressure per piece [lb/in <sup>2</sup> ]
<b>Piston</b>	1	0.2	1	0.2	1	1	1	3	1	10	1	10
<b>Standard mass set</b>	1	0.05	1	0.05	1	4	1	7	2	10	2	10
	1	0.1	1	0.1	2	5	1	90	1	180	1	180
	2	0.2	2	0.2	8	10	2	100	3	200	6	200
	1	0.5	1	0.5	2	2	1	50	1	100	1	100
	1	0.8	1	0.8	1	1	2	20	2	40	2	40
	1	1	1	1	1	0.5	1	10	1	20	1	20
	2	2	2	2	-	-	1	5	1	5	1	5
	2	4	2	4	-	-	-	-	-	-	-	-
<b>Set of fine increment masses (optional)</b>	-	-	1	15	-	-	-	-	-	-	-	-
	-	-	-	-	2	0.2	2	2	1	4	1	4
	-	-	-	-	1	0.1	1	1	1	2	1	2
	-	-	-	-	1	0.05	1	0.5	1	1	1	1
	-	-	-	-	-	-	2	0.2	2	0.4	2	0.4
-	-	-	-	-	-	1	0.1	1	0.2	1	0.2	

1) Other ranges like "in. water column" and "mm. water column" also available on request.

Measuring range [kPa] <sup>1)</sup>	1.5 ... 100		1.5 ... 200		10 ... 700		20 ... 2,500		100 ... 7,000		100 ... 12,000	
	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]	Quantity	Nominal pressure per piece [kPa]
<b>Piston and make-up weight</b>	1	1.5	1	1.5	1	10	1	20	1	100	1	100
<b>Standard mass set</b>	1	0.5	1	0.5	1	40	1	30	2	100	2	100
	3	2	3	2	2	50	1	450	5	1,000	1	1,800
	2	1	2	1	5	100	3	500	1	900	4	2,000
	6	5	6	5	2	20	2	200	2	400	1	1,000
	6	10	6	10	1	10	1	100	1	200	2	400
	-	-	1	100	1	5	1	50	1	50	1	200
<b>Set of fine increment masses (optional)</b>	-	-	-	-	-	-	-	-	-	-	1	50
	-	-	-	-	2	2	2	20	1	40	1	40
	-	-	-	-	1	1	1	10	1	20	1	20
	-	-	-	-	1	0.5	1	5	1	10	1	10
	-	-	-	-	-	-	2	2	2	4	2	4
-	-	-	-	-	-	1	1	1	2	1	2	

1) Other ranges like "in. water column" and "mm. water column" also available on request.

## Specifications

Piston-cylinder systems						
<b>Measuring range in bar <sup>1)</sup></b>	<b>0.015 ... 1</b>	<b>0.015 ... 2</b>	<b>0.1 ... 7</b>	<b>0.2 ... 25</b>	<b>1 ... 70</b>	<b>1 ... 120</b>
Required masses	3.3 kg	6.54 kg	22.5 kg	21 kg	29 kg	49.5 kg
Smallest step <sup>2)</sup> (Standard mass set)	0.005 bar	0.005 bar	0.05 bar	0.3 bar	0.5 bar	0.5 bar
Smallest step <sup>3)</sup> (Set of fine increment masses)	--	--	0.005 bar	0.01 bar	0.02 bar	0.02 bar
Nominal effective area of the piston	1/2 in <sup>2</sup>	1/2 in <sup>2</sup>	1/2 in <sup>2</sup>	1/8 in <sup>2</sup>	1/16 in <sup>2</sup>	1/16 in <sup>2</sup>
<b>Measuring range in lb/in<sup>2</sup> <sup>1)</sup></b>	<b>0.2 ... 15</b>	<b>0.2 ... 30</b>	<b>1 ... 100</b>	<b>3 ... 400</b>	<b>15 ... 1,000</b>	<b>10 ... 1,600</b>
Required masses	3.3 kg	6.54 kg	22.6 kg	22.4 kg	26.9 kg	45.5 kg
Smallest step <sup>2)</sup> (Standard mass set)	0.05 lb/in <sup>2</sup>	0.05 lb/in <sup>2</sup>	0.5 lb/in <sup>2</sup>	5 lb/in <sup>2</sup>	5 lb/in <sup>2</sup>	5 lb/in <sup>2</sup>
Smallest step <sup>3)</sup> (Set of fine increment masses)	--	--	0.05 lb/in <sup>2</sup>	0.1 lb/in <sup>2</sup>	0.2 lb/in <sup>2</sup>	0.2 lb/in <sup>2</sup>
Nominal effective area of the piston	1/2 in <sup>2</sup>	1/2 in <sup>2</sup>	1/2 in <sup>2</sup>	1/8 in <sup>2</sup>	1/16 in <sup>2</sup>	1/16 in <sup>2</sup>
<b>Measuring range in kPa <sup>1)</sup></b>	<b>1.5 ... 100</b>	<b>1.5 ... 200</b>	<b>10 ... 700</b>	<b>20 ... 2,500</b>	<b>100 ... 7,000</b>	<b>100 ... 12,000</b>
Required masses	3.3 kg	6.54 kg	22.5 kg	21 kg	29 kg	49.5 kg
Smallest step <sup>2)</sup> (Standard mass set)	0.5 kPa	0.5 kPa	5 kPa	30 kPa	50 kPa	50 kPa
Smallest step <sup>3)</sup> (Set of fine increment masses)	--	--	0.5 kPa	1 kPa	2 kPa	2 kPa
Nominal effective area of the piston	1/2 in <sup>2</sup>	1/2 in <sup>2</sup>	1/2 in <sup>2</sup>	1/8 in <sup>2</sup>	1/16 in <sup>2</sup>	1/16 in <sup>2</sup>
<b>Accuracies</b>						
Standard <sup>4)</sup>	0.015 % of reading					
Premium <sup>5)</sup>	0.008 % of reading		0.006 % of reading		0.008 % of reading	
<b>Material</b>						
Piston	High-chromium steel			Tungsten carbide	High-chromium steel	
Cylinder	High-alloy heat treatable stainless steel			Tungsten carbide	Bronze	
Mass set	Stainless steel, non-magnetic					
<b>Weight</b>						
Piston-cylinder system	0.5 kg [1.1 lbs]	0.5 kg [1.1 lbs]	1 kg [2.2 lbs]	1 kg [2.2 lbs]	2 kg [4.4 lbs]	2 kg [4.4 lbs]
bar mass set incl. mass carrier	4 kg [8.8 lbs]	7.6 kg [16.8 lbs]	23 kg [50.8 lbs]	24 kg [53.0 lbs]	32 kg [70.7 lbs]	53 kg [117 lbs]
kPa mass set incl. mass carrier	4 kg [8.8 lbs]	7.6 kg [16.8 lbs]	23 kg [50.8 lbs]	24 kg [53.0 lbs]	32 kg [70.7 lbs]	53 kg [117 lbs]
lb/in <sup>2</sup> mass set incl. mass carrier	4 kg [8.8 lbs]	7.6 kg [16.8 lbs]	23 kg [50.8 lbs]	24 kg [53.0 lbs]	30 kg [66.3 lbs]	49 kg [108 lbs]
Storage case for mass set (optional, 2 pieces required)	5.8 kg [12.8 lbs]					
<b>Dimensions (W x H x D)</b>						
Storage case for mass set (optional)	300 x 265 x 205 mm [11.8 x 10.4 x 8.1 in] <sup>6)</sup>		400 x 310 x 310 mm and 215 x 310 x 310 mm [15.8 x 12.2 x 12.2 in and 8.5 x 12.2 x 12.2 in]			

1) Theoretical starting value; corresponds to the pressure value generated by the piston or the piston and its make-up weight (by their own weight). To optimise the operating characteristics more masses should be loaded.

2) The smallest pressure change value that can be achieved based on the standard mass set.

3) The smallest pressure change value that can be achieved based on the optional set of fine increment masses. For further reductions, an accessory of class M1 or F1 set of fine increment masses is available.

4) The accuracy is in reference to the measured value, from 10 % of the measuring range to compensate for actual area of piston unit. Standard accuracy without any corrections for the actual area down to 0.02 % (0.03 % of reading below 10 % of range). For the range 0.015 ... 1 bar the accuracy below 10 % of the range is 0.04 % of reading.

5) Available as high-accuracy class dead-weight testers supplied with UKAS calibration certificates for area and mass.

6) Piston and mass set can be supplied in a flight box.

Base	
<b>Connections</b>	
Connection for piston-cylinder system	G 1, female thread
Test connection	G ½, female thread, loose union connection, incl. adapter set to G ¼ and G ⅜, female threads
External pressure connection	G ¼ and G ¼ B, female thread to ¼ NPT, female thread, adapter included in delivery
<b>Pressure transmission medium</b>	
Base	Pneumatic based on clean, dry and non-corrosive gases (e.g. air or nitrogen)
<b>Weight</b>	
Base	12 kg [26.5 lbs]
<b>Permissible ambient conditions</b>	
Operating temperature	10 ... 30 °C [50 ... 86 °F]
Storage temperature	-10 ... +50 °C [14 ... 122 °F]
Humidity (place of storage)	<ul style="list-style-type: none"> <li>■ 35 ... 85 % relative humidity for instrument base and mass set (non-condensing)</li> <li>■ 35 ... 65 % relative humidity for piston-cylinder system (non-condensing)</li> </ul>
<b>Dimensions (W x D x H)</b>	
Base	510 x 490 x 300 mm [20.1 x 19.39 x 11.8 in] → For details, see technical drawing

## Approvals

Logo	Description	Region
EAC	EAC	Eurasian Economic Community
	EMC directive	
	Pressure equipment directive Machinery directive	
-	MChS Permission for commissioning	Kazakhstan

## Certificates

Certificate	
<b>Calibration</b>	
Dead-weight tester CPB3500	<ul style="list-style-type: none"> <li>■ 3.1 inspection certificate per DIN EN 10204 (factory calibration)</li> <li>■ UKAS calibration certificate (pressure calibration with a mass set)</li> <li>■ UKAS calibration certificate (area and mass calibration)</li> </ul>
Set of fine increment mass CPM3500	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ 3.1 inspection certificate per DIN EN 10204 (factory calibration)</li> <li>■ UKAS calibration certificate (pressure calibration with a piston-cylinder system)</li> <li>■ UKAS calibration certificate (mass calibration)</li> </ul>
Piston-cylinder system CPS3500	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ 3.1 inspection certificate per DIN EN 10204 (factory calibration)</li> <li>■ UKAS calibration certificate (pressure calibration with a mass set)</li> <li>■ UKAS calibration certificate (area calibration)</li> </ul>
<b>Recommended calibration interval</b>	2 to 5 years (dependent on conditions of use)

→ Approvals and certificates, see website

## Transport dimensions for complete instrument

The complete instrument, in its standard version and standard scope of delivery, consists of up to 3 packages on a single pallet.

The dimensions are 1,200 x 800 x 500 mm [47.3 x 31.5 x 19.7 in].

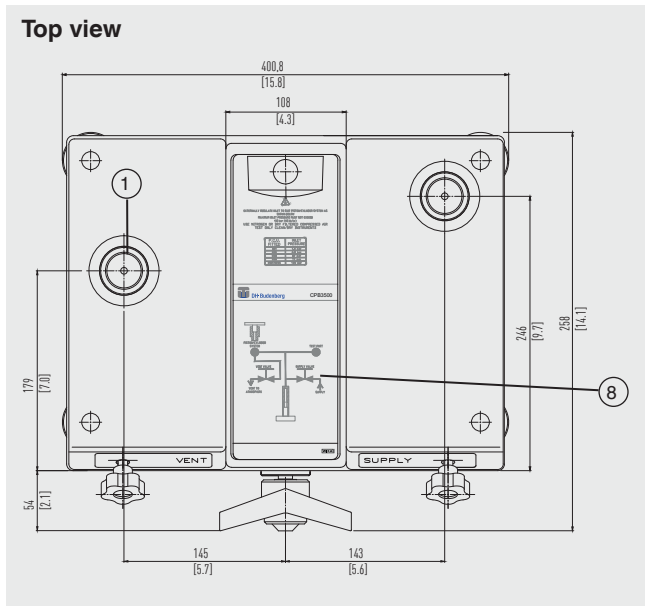
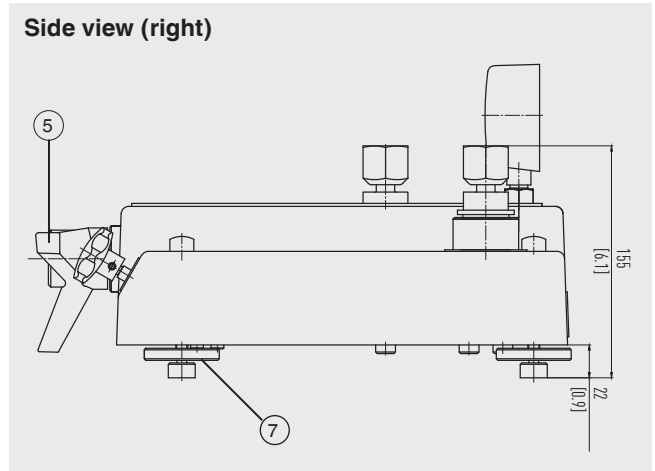
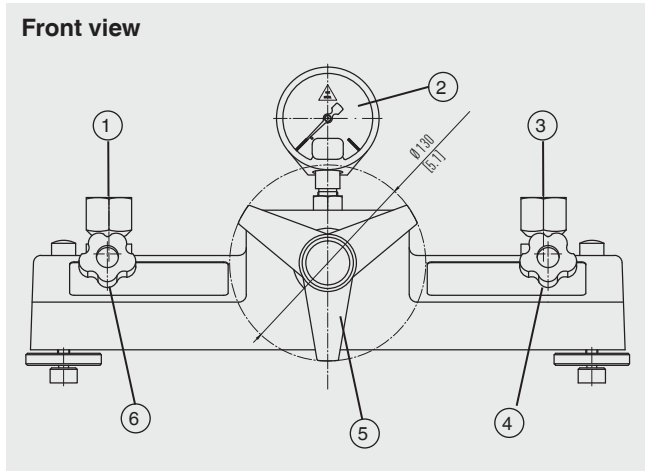
The overall weight is dependent on the measuring range.

Version in bar	Weight			
	net		gross	
0.015 ... 1 bar	14 kg	[30.9 lbs]	35 kg	[77.2 lbs]
0.015 ... 2 bar	17.6 kg	[38.8 lbs]	38.6 kg	[85.1 lbs]
0.1 ... 7 bar	34 kg	[75.0 lbs]	55 kg	[121.3 lbs]
0.2 ... 25 bar	32 kg	[70.6 lbs]	53 kg	[116.9 lbs]
1 ... 70 bar	36 kg	[79.4 lbs]	57 kg	[125.7 lbs]
1 ... 120 bar	62 kg	[136.7 lbs]	83 kg	[183.0 lbs]

Version in lb/in <sup>2</sup>	Weight			
	net		gross	
0.2 ... 15	14 kg	[30.9 lbs]	35 kg	[77.2 lbs]
0.2 ... 30	17.6 kg	[38.8 lbs]	38.6 kg	[85.1 lbs]
1 ... 100 lb/in <sup>2</sup>	34 kg	[75.0 lbs]	55 kg	[121.3 lbs]
3 ... 400 lb/in <sup>2</sup>	34 kg	[75.0 lbs]	55 kg	[121.3 lbs]
15 ... 1,000 lb/in <sup>2</sup>	36 kg	[79.4 lbs]	57 kg	[125.7 lbs]
10 ... 1,600 lb/in <sup>2</sup>	58 kg	[127.9 lbs]	79 kg	[174.2 lbs]

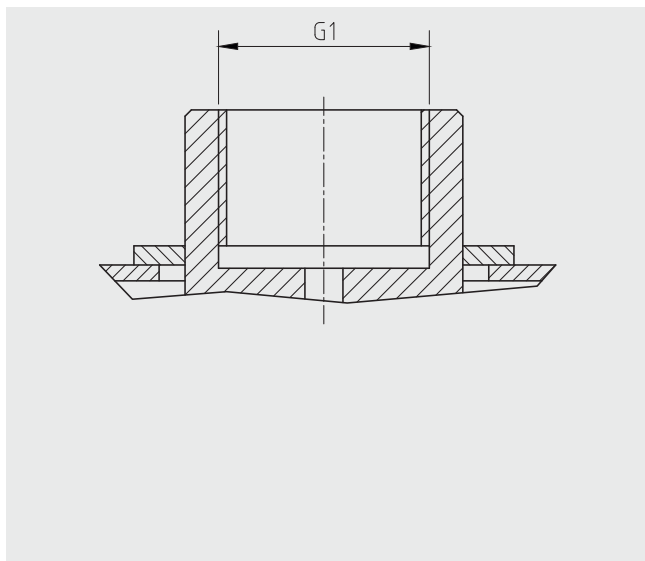
Version in kPa	Weight			
	net		gross	
1.5 ... 100 kPa	14 kg	[30.9 lbs]	35 kg	[77.2 lbs]
1.5 ... 200 kPa	17.6 kg	[38.8 lbs]	38.6 kg	[85.1 lbs]
10 ... 700 kPa	34 kg	[75.0 lbs]	55 kg	[121.3 lbs]
20 ... 2,500 kPa	32 kg	[70.6 lbs]	53 kg	[116.9 lbs]
100 ... 7,000 kPa	36 kg	[79.4 lbs]	57 kg	[125.7 lbs]
100 ... 12,000 kPa	62 kg	[136.7 lbs]	83 kg	[183.0 lbs]

# Dimensions in mm [in]

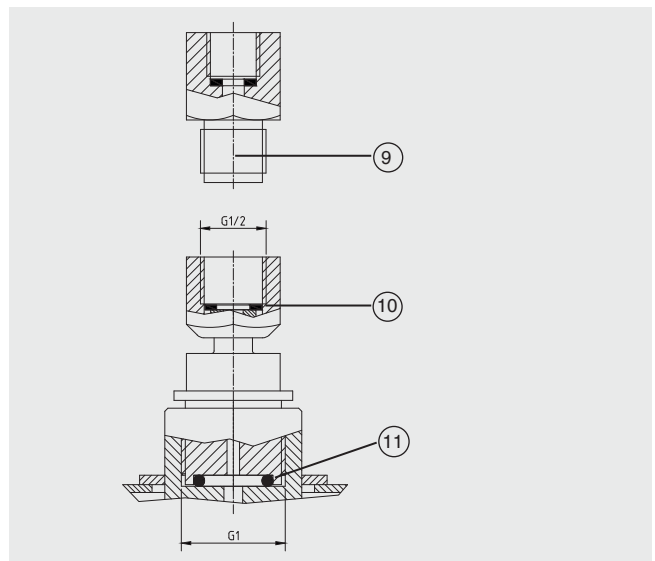


- ① Connector for piston-cylinder system
- ② Pressure measuring instrument
- ③ Test connection with G 1/2, female thread, loose union connection
- ④ Inlet valve
- ⑤ Volume adjuster with star handle
- ⑥ Vent valve
- ⑦ Levelling feet
- ⑧ Pressure generation control schematic
- ⑨ Adapter, see scope of delivery
- ⑩ Sealing ring USIT 10.7 x 18 x 1.5
- ⑪ O-ring 18.4 x 3.5

## Standard connection piston-cylinder system



## Test connection







## Accessories

### Pneumatic/hydraulic separator

For calibrating low-pressure hydraulic instruments with gas, a gas/liquid separator is used. It can also be used to protect the pressure balance (dead-weight tester) from contamination.



Pneumatic/hydraulic separator, model 35

### Adapter set

As standard, the pressure balance (dead-weight tester) is equipped with a connector for connecting the test item. For this purpose, the following threaded inserts, which can be easily changed, are available:

- Adapter set (BSP): G 1/8, G 1/4, G 3/8 and G 1/2
- Adapter set (NPT): 1/8 NPT, 1/4 NPT, 3/8 NPT and 1/2 NPT
- Adapter set (metric): M12 x 1.5 and M20 x 1.5

### Vacuum adapter

Used for calibrating in the vacuum range to -1 bar [-14.5 lb/in<sup>2</sup>] (for measuring ranges -1 bar and -100 kPa only).



Vacuum adapter

### Dirt trap, separator



For test objects that are very dirty, the use of a dirt trap is recommended in order to avoid the penetration of dirt particles into the pressure balance (dead-weight tester).




The separator (without diaphragm) has been specifically developed for measuring instruments where the filling medium should not come into contact with the pressure balance (dead-weight tester). It is typically used with pressure balances (dead-weight testers) for the calibration of instruments with water as the test medium as well as with pneumatic pressure balances (dead-weight testers) (only with external pressure supply) for the calibration of instruments with water or oil as the test medium.



Fig. left: Separator  
Fig. right: Dirt trap

## Accessories

	Description	Order code
	Instrument base model CPB3500	CPB-A-AA- -1-
	Set of fine increment masses model CPM3500	-2-
	In bar, accuracy class M1	-3-
	In lb/in <sup>2</sup> , accuracy class M1	-4-
	In kPa, accuracy class M1	

Description		Order code
		CPB-A-AA-
-	<b>Adapter set</b> "BSP" for test connection G ½ B, male thread on G ⅛, G ¼, G ⅜ and G ½, female thread	-5-
-	<b>Adapter set</b> "NPT" for test connection G ½ B, male thread on ⅛ NPT, ¼ NPT, ⅜ NPT and ½ NPT, female thread	-6-
-	<b>Adapter set</b> "metric" for test connection G ½ B, male thread on M12 x 1.5 and M20 x 1.5, female thread	-7-
	<b>Vacuum adapter</b> For measuring ranges 1 bar and 100 kPa only (Model 24)	-8-
-	<b>Storage case</b> For model CPB3500 instrument base and piston-cylinder system	-A-
	<b>Two storage cases</b> For mass set	-B-
-	<b>Test connection</b> G 1 B, male thread to G ½, female thread, rotating	-C-
	<b>Dual test connection</b> G 1 B, male thread to G ½, female thread, rotating (model 27)	-D-
	<b>Separator</b> 0 ... 35 bar (Model 35)	-E-
	<b>Hydraulic fluid based on VG22 mineral oil</b> In plastic bottle, content 0.5 litre	-F-
	<b>Sealing and maintenance set</b> For instrument base model CPB3500	-G-
	<b>Tool set</b> Consisting of: <ul style="list-style-type: none"> <li>■ Open-ended spanners</li> <li>■ BSP adapter</li> <li>■ Replacement seals</li> <li>■ Pointer remover</li> <li>■ Pointer punch</li> </ul>	-H-
<b>Ordering information for your enquiry:</b>		
<b>1. Order code: CPP-A-AA</b> <b>2. Option:</b>		↓ [   ]

1) The figures are an example and may change depending on the state of the art in design, material composition and representation

## Scope of delivery

- Instrument base with ABS cover
- Piston-cylinder system
- Masses manufactured to standard gravity (standard value: 9.80665 m/s<sup>2</sup>)
- VG22 mineral oil (0.5 litre), for 70 bar and 120 bar [1,000 lb/in<sup>2</sup> and 1,600 lb/in<sup>2</sup>] only
- Standard tool kit with:
  - 1 x Allen key 2
  - 1 x Allen key 3
  - 2 x Open-ended spanner SW 30
  - 1 x Level
  - 4 x plates for levelling feet
  - 1 x Bag with sealings
  - 1 x G 1/2 connection for test item
  - 1 x Pointer punch
  - 1 x Pointer remover
  - 1 x Adapter for inlet connection
  - 1 x Set of connections consisting of 1 x (BSP) G 1/8, G 1/4, G 3/8 and G 1/2
- Operating instructions
- Calibration certificate(s)

## Options

- Systems with premium accuracies to 0.006 %
- Masses manufactured to local gravity
- Sets of fine increment masses
- UKAS calibration certificate

## Ordering information

### Instrument base

CPB3500 / Package / Accuracy / Gravity value g / Fine increment masses / Standard adapter set / Vacuum adapter / Storage case / Calibration for dead-weight tester / Calibration for fine increment masses / Accessories / Further approvals / Additional ordering information

### Piston-cylinder system

CPS3500 / Accuracy / Gravity value g / Measuring range / Calibration for piston-cylinder system / Additional ordering information

### Set of fine increment masses

CPM3500 / Gravity value g / Fine increment masses / Storage case / Calibration for mass set / Additional ordering information

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