

### Differential Pressure Deadweight Tester ( Pressure Balance) CPB5000-DP Real differential pressure calibration



- Pneumatic ranges: up to 100 bar / 1500 psi  
Hydraulic ranges: up to 1000 bar / 15000 psi
- Accuracy (total uncertainty): up to  $\pm 0.010\%$  of measured value
- Tester with two piston-/cylinder-units and two weight sets
- One spindle pump for generating the static line pressure, another one for generating the differential pressure
- Options: DKD certification, IKM intelligent calibration module for automatic calculation of corrections etc.

Deadweight Tester (Pressure Balances) are the most accurate instruments for the calibration of electronic or mechanical pressure measuring instruments.

The differential pressure deadweight tester **CPB5000-DP** allows a real calibration of differential pressures, based on static line pressure.

The **CPB5000-DP** includes two common pressure balances of the basic series CPB5000. For the calibration of differential gauges at a static line pressure, the systems can be separated.

One system is used to generate the line pressure. The second one supplies the differential pressure (including line pressure).

For the basic specification, see *datasheet CPB5000*.

A certificate of calibration, traceable to national standard is included in standard scope of supply. As an option, a DKD certification is available.

The differential pressure deadweight tester **CPB5000-DP** are available in two accuracies:

- $\pm 0.015\%$  of measured value, or
- $\pm 0.010\%$  of measured value

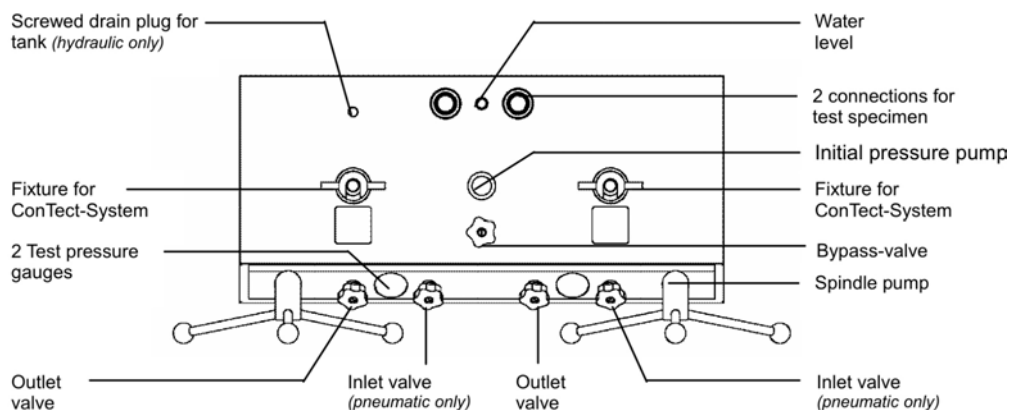
#### Optional Accessories:

- Intelligent Calibration Module IKM (see *datasheet "IKM"*). This module measures ambient values like temperature, humidity, barometric pressure, as well as the temperature of the piston/cylinder system and makes an automatic calculation of the corrections.
- Set of trim-masses for generating intermediate values (weights 2 mg to 100 g)
- Oxytester (purifier) for measuring instruments where the filling medium should not come into contact with the deadweight tester.
- Dirt trap for test objects that are very dirty in order to avoid the penetration of dirt particles into the deadweight tester
- Set of adapters in a tool case with 5 most commonly used threaded adapters, and a spanner

#### Standard Scope of Supply:

- Basement
- 1 priming pump and 2 spindle pumps (pressure generation and adjustment), with bypass-valve
- 2 connections for test specimen
- 2 piston-/cylinder - systems
- 2 weight sets in stainless steel
- 1 Liter operating fluid (at hydraulic types)
- operating manual
- traceable certificate of calibration

#### Arrangement of control elements:



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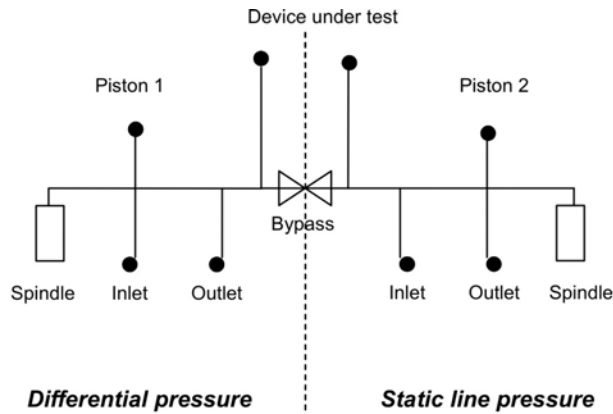
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### Working principle:



### Operation:

First step is to apply the pressure. ATTENTION - the line pressure can be a lot higher than the differential pressure (for example 2 bar differential at 50 bar line pressure). Therefore a smooth and even pressure increase is very important. Otherwise the device under test can be destroyed. Via the Bypass-valve, a shortcut between the two pressure-systems can be generated. So both ports change with the same pressure-rate.

The use of each system is comparable to the common basic version CPB5000. Therefore also see that manual for further descriptions about handling.

- Open Bypass-Valve.
- Load the differential piston with the required masses (for static line pressure).
- Load the static piston with the required masses (for static line pressure).
- Pneumatic systems: use the valves to set the pressure; hydraulic systems: use the spindle pump to set the pressure.
- For fine adjustment use the spindle pump.
- Now, both systems should be in floating position.

If both systems float and spin, the device under test is applied to a zero pressure (Note, but each port has an additional line pressure!). The sink rate of the two systems should be comparable. Otherwise add some trim-masses at the static piston.

After setting of line pressure, the differential pressure can be added to the system. Now the two pressure systems are separated; therefore:

- Close Bypass-Valve
- Load masses for differential pressure on diff.-piston (included the line pressure).
- Use the valves resp. spindle pump to set new pressure.
- Verify free spinning of static piston and if necessary, adapt with spindle pump.

As soon as both systems are floating, the pressure value at the device under test is stable and can be verified.

After the calibration, check the zero-pressure (differential):

- Open Bypass-Valve
- Both pressure ports are in balance again.
- Vent the system with the outlet-valve.

Because of the shortcut between the two systems (via bypass-valve) both ports change with same pressure rate now. ATTENTION - If the pressure decrease is unequal, the test specimen could be destroyed.

Available Pressure Ranges:			Execution	Range [bar]	Range [psi]
Execution	Range [bar]	Range [psi]	hydraulic	0.2 ... 60	
pneumatic		0.435 ... 30	hydraulic	0.2 ... 100	2.9 ... 1000
pneumatic	0.03 ... 2	2.9 ... 150	hydraulic	1 ... 250	14.5 ... 5000
pneumatic	0.2 ... 10	5.8 ... 500	hydraulic	1 ... 400	29 ... 10000
pneumatic	0.4 ... 50	5.8 ... 1000	hydraulic	2 ... 600	29 ... 10000
pneumatic	0.4 ... 100	5.8 ... 1500	hydraulic	2 ... 1000	29 ... 15000



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