Pressure balance

Description

Proven primary standard

Pressure balances are the most accurate instruments for the calibration of electronic or mechanical pressure measuring instruments.
The direct measurement of pressure, according to its definition as a quotient of force and area, and the use of high-quality materials result in small uncertainties of measurement and an excellent long-term stability of five years.
For these reasons pressure balances have already been used in calibration laboratories of industry, national institutes and research labs for many years.

Self-sustaining operation

Due to the integrated pressure generation and the purely mechanical measuring principle the pressure balance is ideally suited for on-site use as well as service and maintenance purposes.

Patented ConTect measuring system

The new patented concept for a customised pressure balance assembly enables you to set up a compact complete system at a favourable price, consisting of a universal basement and the measuring systems. The high-quality sensitive piston cylinder systems are well protected in the ConTect housing. Fast and uncomplicated changes of the measuring range are possible without having to use any tools.

Features

- A basement can be fitted with individual measuring systems
- Patented concept for fast and safe replacement of the measuring systems
- Total uncertainty of measurement up to 0.01 % (of measured value); adaptation to specific customer requirements and documentation in the calibrat ion certificate (traceable to a national standard)
- High long-term stability with a recommended recalibration cycle of 5 years

Measuring ranges

scale in a range of up to 100 bar (pneumatic)
or 4000 bar (hydraulic)

Applications

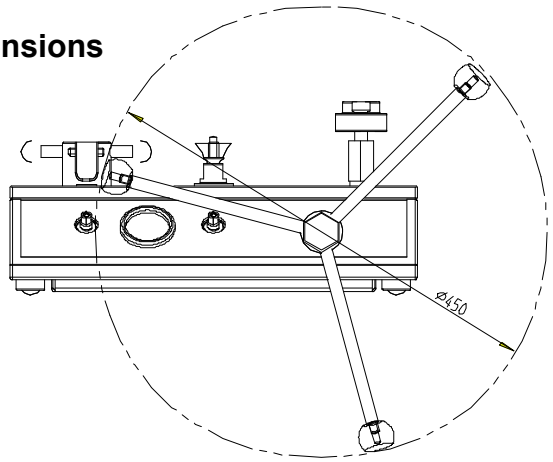
- Reference instrument for testing, adjusting and calibrating pressure measuring instruments in factory and calibration laboratories

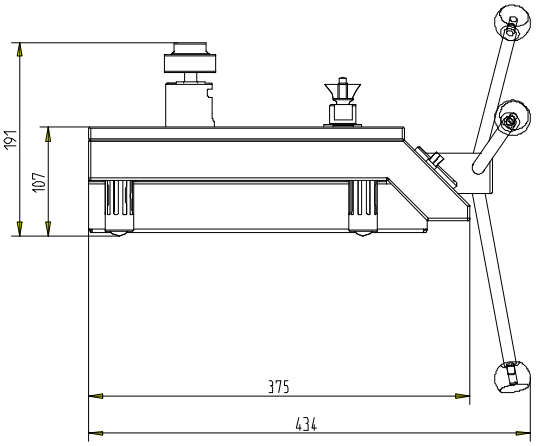
- Self-sustaining complete system also suitable for on-site measurements / calibrations

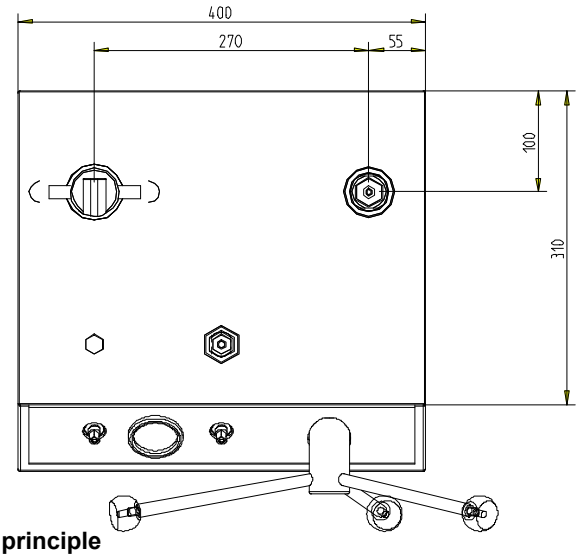
Model:
C1350X3XX/C1351X3XX

tecsis GmbH
Carl-Legien Str. 40
D-63073 Offenbach / Main
Tel.: +49(0) 69 / 5806-0
Sales National
Fax: +49(0) 69 / 5806-170
Sales International
Fax: +49(0) 69 / 5806-177
e-Mail: info@tecsis.de
Internet: www.tecsis.de

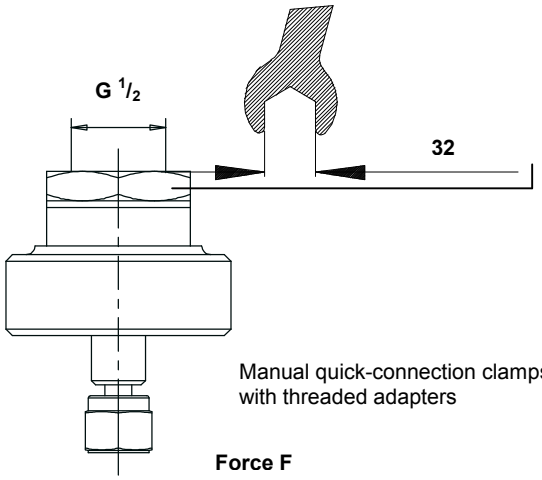
Dimensions







Adapter for specimen connection



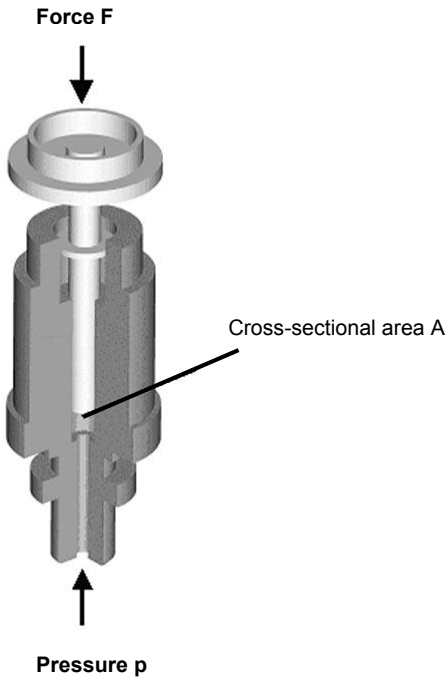
Manual quick-connection clamps
with threaded adapters

Basic principle

Pressure is defined as a quotient of force and area. Correspondingly, the core of the pressure balance is a piston cylinder system of tungsten carbide. Besides this high-quality material, which primarily stands out for its small temperature coefficient, the workmanship of the system is a measure of the final accuracy of the pressure balance. Several refinement processes ensure a high-quality and even surface with small gaps of only a few micrometers. In order to generate the individual test points, the piston cylinder system is weighted with mass-loads, which are also calibrated and specially adapted to the respective application.

Easy functioning

Depending on the measuring range of your device under test you can fit the instrument basement with the corresponding system. The pressure is set via an integrated pump or, if an external pressure supply is available, via control valves. For fine adjustment an adjustable volume with precision spindle is available. The weight applied is proportional to the desired pressure and provided by using optimally graduated weights. As soon as the measuring system reaches equilibrium, there is a balance of forces between pressure and mass-load. Due to the excellent quality of the system this pressure remains stable over several minutes, so that for instance adjustments of your device under test can be carried out without any problems.



Piston Cylinder System in the ConTect Housing

Specifications

Measuring range in bar	**Model** (Set of weights/ Piston Cylinder System**)**	**Version**	**Required mass-loads in kg**	**min. pressure step in bar** [4]	**Accuracy** [1] **in % RDG**	**Accuracy** [1] **Min. in mbar**
0.03 ... 2	C1351X302001	Pneumatic [2]	10	0.01	0.015	0.03
0.2 ... 10	C1351X302002	Pneumatic [2]	10	0.05	0.015	0.15
0.4 ... 50	C1351X302003	Pneumatic [2]	10	0.25	0.015	0.75
0.4 ... 100	C1351X302004	Pneumatic [2]	20	0.25	0.015	1.5
0.2 ... 60	C1350X303001	Hydraulic [3]	30	0.1	0.015	0.9
0.2 ... 100	C1350X303002	Hydraulic [3]	50	0.1	0.015	1.5
1 ... 250	C1350X303003	Hydraulic [3]	25	0.5	0.015	3.75
1 ... 400	C1350X303004	Hydraulic [3]	40	0.5	0.015	6
2 ... 600	C1350X303005	Hydraulic [3]	30	1	0.015	9
2 ... 1000	C1350X303006	Hydraulic [3]	50	1	0.015	15
2 ... 1200	C1350X303007	Hydraulic [3]	60	2	0.015	18
25 ... 2500	C1350X303008	Hydraulic [3]	50	2.5	0.025	62.5
25 ... 4000	C1350X303009	Hydraulic [3]	80	2.5	0.025	100

1) The accuracy is characterised by the deviation span, which is the sum of the systematic error and the uncertainties of measurement.
Long-term stability is not taken into account.
Please note that corrections might be required, if the instrument is used without CalibratorUnit (see operating instructions).
2) Suitable for clean dry air or nitrogen - other media on request.
3) As a standard for special oil (1 litre included in scope of delivery) - other media on request.
4) Optional trim-masses can be used for reducing the pressure steps.

As an option systems with increased accuracies up to 0.01 % are available.

Scope of supply

- Basement with Inlet pressure pump
- Spindle pump for pressure generation
- Clamp for specimens
- Piston cylinder system(s)
- Set of weights in a transport case
- Special oil (for hydraulic version)
- Operating instructions in German and English
- Calibration certificate

Options

- Systems with increased accuracies up to 0.01 %
- DKD calibration certificate (traceable to national standard)
- High pressure version for 2500 bar resp. 4000 bar
- Differential pressure version

Mass chart for Pressure balance

	Pneumatic models											
	0,03 ... 2 bar			0,2 ... 10 bar			0,4 ... 50 bar			0,4 ... 100 bar		
	Pcs	Rated press-ure per pcs in bar	Rated pressur e per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated pressur e per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated pressur e per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated pressur e per pcs in bar
piston	1	0,03	0,03	1	0,2	0,2	1	0,4	0,4	1	0,4	0,4
Mass carrying bell	1	0,16	0,16	1	0,8	0,8	1	4	4	1	4	4
pistoncylinder	1	0,01	0,01	1	0,05	0,05	1	0,25	0,25	1	0,25	0,25
Mass loads to 2 kg	0			0			0			0	10	50
Mass loads to 1 kg	9	0,2	1,8	9	1	9	9	5	45	9	5	45
Mass loads to 0,5 kg	1	0,1	0,1	1	0,5	0,5	1	2,5	2,5	1	2,5	2,5
Mass loads to 0,2 kg	2	0,04	0,08	2	0,2	0,4	2	1	2	2	1	2
Mass loads to 0,12 kg	1	0,024	0,02	1	0,12	0,12	1	0,6	0,6	1	0,6	0,6
Mass loads to 0,1 kg	1	0,02	0,02	1	0,1	0,1	1	0,5	0,5	1	0,5	0,5
Mass loads to 0,07 kg	1	0,014	0,014	1	0,07	0,07	1	0,35	0,35	1	0,35	0,35
Mass loads to 0,05 kg	1	0,01	0,01	1	0,05	0,05	1	0,25	0,25	1	0,25	0,25

	Hydraulic models														
	0,2 ... 100 bar			5 ... 250 bar			5 ... 400 bar			5 ... 600 bar			5 ... 1000 bar		
	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar
piston	1	0,2	0,2	1	1	1	1	1	1	1	2	2	1	2	2
Mass carrying bell	1	1,6	1,6	1	8	8	1	8	8	1	16	16	1	16	16
pistoncylinder	1	0,1	0,2	1	0,5	1	1	0,5	1	1	1	2	1	1	2
Mass loads to 4 kg	11	8	88	5	40	200	11	40	440	6	80	480	11	80	880
Mass loads to 2 kg	2	4	8	2	20	40	2	20	40	2	40	80	2	40	80
Mass loads to 1 kg	1	2	2	1	10	10	1	10	10	1	20	20	1	20	20
Mass loads to 0,5 kg	2	1	2	2	5	10	2	5	10	2	10	20	2	10	20
Mass loads to 0,2 kg	2	0,4	0,8	2	2	4	2	2	4	2	4	8	2	4	8
Mass loads to 0,1 kg	2	0,2	0,4	2	1	2	2	1	2	2	2	4	2	2	4
Mass loads to 0,05 kg	2	0,1	0,2	2	0,5	1	2	0,5	1	2	1	2	2	1	2

	High pressure Models					
	25 ... 2500 bar			25 ... 4000 bar		
	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar	Pcs	Rated press-ure per pcs in bar	Rated press ure per pcs in bar
piston	incl.	25	25	incl.	25	25
Mass carrying bell	incl.			incl.		
pistoncylinder	incl.			incl.		
Mass loads to 5 kg	0	0	0	6	250	1500
Mass loads to 4 kg	4	200	800	4	200	800
Mass loads to 2 kg	16	100	1600	16	100	1600
Mass loads to 1 kg	1	50	50	1	50	50
Mass loads to 0,5 kg	2	25	50	2	25	50
Mass loads to 0,2 kg	2	10	20	2	10	20
Mass loads to 0,1 kg	2	5	10	2	5	10
Mass loads to 0,05 kg	2	2,5	5	2	2,5	5

Accessories

Set of trim-masses
The weights included in the standard scope of delivery are ideally suited for everyday use. If you would like to generate intermediate values anyhow, we recommend using a set of trim-masses class F1, with weights from 2 mg to 100 g.

Dirt trap, purifier
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.
The purifier has been specially conceived for measuring instruments where the filling medium should not come into contact with the pressure balance. It is typically used with pneumatic pressure balances for the calibration of instruments with the test media water and oil.

Set of adapters in a tool case
As a standard the pressure balance is equipped with a clamp for the adaptation of the test object. For this purpose various threaded adapters, which can be easily exchanged, are available. The set of adapters includes the five most commonly used threaded adapters as well as a spanner, flats 32 and flats 14, for exchanging the adapters.

Products and services within our testing and calibration technology program

- DKD calibration services for pressure
- Repair of calibration units of all makes
- Portable pressure measuring devices for testing and calibration tasks
- Precision pressure measuring units and pressure controllers
- Primary standards for pressure
- Testing technology system solutions
- Temperature dry well calibrators
- Calibration baths and furnaces
- Temperature measuring instruments for testing and calibrating tasks
- Precision thermometers
- Primary standards for temperature

Subject to technical changes