

Absolute and gauge - pressure deadweight tester MPA



Intended use

Absolute and gauge-pressure measuring instruments calibration and verification: pressure calibrators, barometers, pressure transducers (sensors), digital manometers, deadweight testers, with accuracy class of 0.008 and lower within the range from -0.1 to 10 MPa.

Highlights

Complete replacement of deadweight testers type 2465, 2468, MPA15, MPAK, MAD-720, MAD-3M.

Absolute and gauge-pressure measurement all-in-one instrument. High accuracy classes including reference standards.

Modular system: to extend measurement range, several piston-cylinder assemblies (PCA) may be used within one basement with pressure generator.

Modern system of instrument control and monitoring of all the units from one multitask touch screen.

Alternatively to analogues available, high accuracy measurement of residual pressure by precise membrane capacitive vacuummeter is provided.

Automatic start of PCA piston motor when the piston is in floating position. Built-in pumps to create absolute and gauge-pressure up to 1 MPa.

Main Technical and Performance Data

	MPA - 0,2	MPA - 0,5	MPA - 1	MPA - 2,5	MPA - 4	MPA - 10	MPA - 25	MPA - 100
Absolute and gauge-pressure measurement range, MPa	0,7·10 ⁻³ ...0,02	0,7·10 ⁻³ ...0,05	0,004...0,1	0,004...0,25	0,004...0,4	0,03...1	0,03...2,5	0,06...10
Accuracy class ¹	0,01; 0,008; 0,005; 0,003							
Pressure measurement resolution provided by standard set of weights, kPa	0,1	0,1	1	1	1	5	5	25
Working medium	Air or nitrogen							
Nominal area of piston, cm ²	25	25	5	5	5	1	1	0,2
Nominal mass weights under the standard scope of supply, pc								
0,025 kg	1	1	—	—	—	—	—	—
0,04 kg	—	—	—	—	—	—	—	1
0,05 kg	2	2	1	1	1	1	1	1
0,08 kg	—	—	—	—	—	—	—	1
0,1 kg	—	—	2	2	2	1	1	1
0,125 kg	1	1	—	—	—	—	—	—
0,2 kg	—	—	—	—	—	2	2	2
0,25 kg	4	4	1	1	1	—	—	—
0,5 kg	—	—	7	2	2	1	1	1
1,0 kg	—	—	—	11	2	9	4	3
1,250 kg	3	9	—	—	—	—	—	—
2,0 kg	—	—	—	—	8	—	10	8
PCA	1	1	1	1	1	1	1	1
Bell	—	—	1	1	1	1	1	1
Plate	1	1	1	1	1	1	1	1

¹ Within the main measurement range from 0.1 · Pmax to Pmax accuracy is rated as% of value to be measured; within the supplementary measurement range from Pmin to 0.1 · Pmax accuracy is rated as% of 0.1 · Pmax (where Pmax — upper measurement limit; Pmin — lower measurement limit).

Description

Deadweight testers MPA consist of the main device, basement with pressure generator, reference piston-cylinder assembly (PCA) with the set of weights, two high-efficiency low-noise backing vacuum pumps with control panel, and set of vacuum hoses and fittings for MPA devices connection. The device may be equipped with several PCAs with different measurement ranges.

The main device consists of basement with control unit and vacuum chamber. In vacuum chamber with low absolute pressure (lower than 5 Pa) generated and maintained by backing vacuum pump, there is reference PCA for absolute pressure measurement generated by pressure generator (PG). Vacuum chamber represents transparent plastic vessel with demountable upper cover.

Residual pressure within the vacuum chamber is measured by high-precision absolute pressure membrane capacitance-type transmitter.

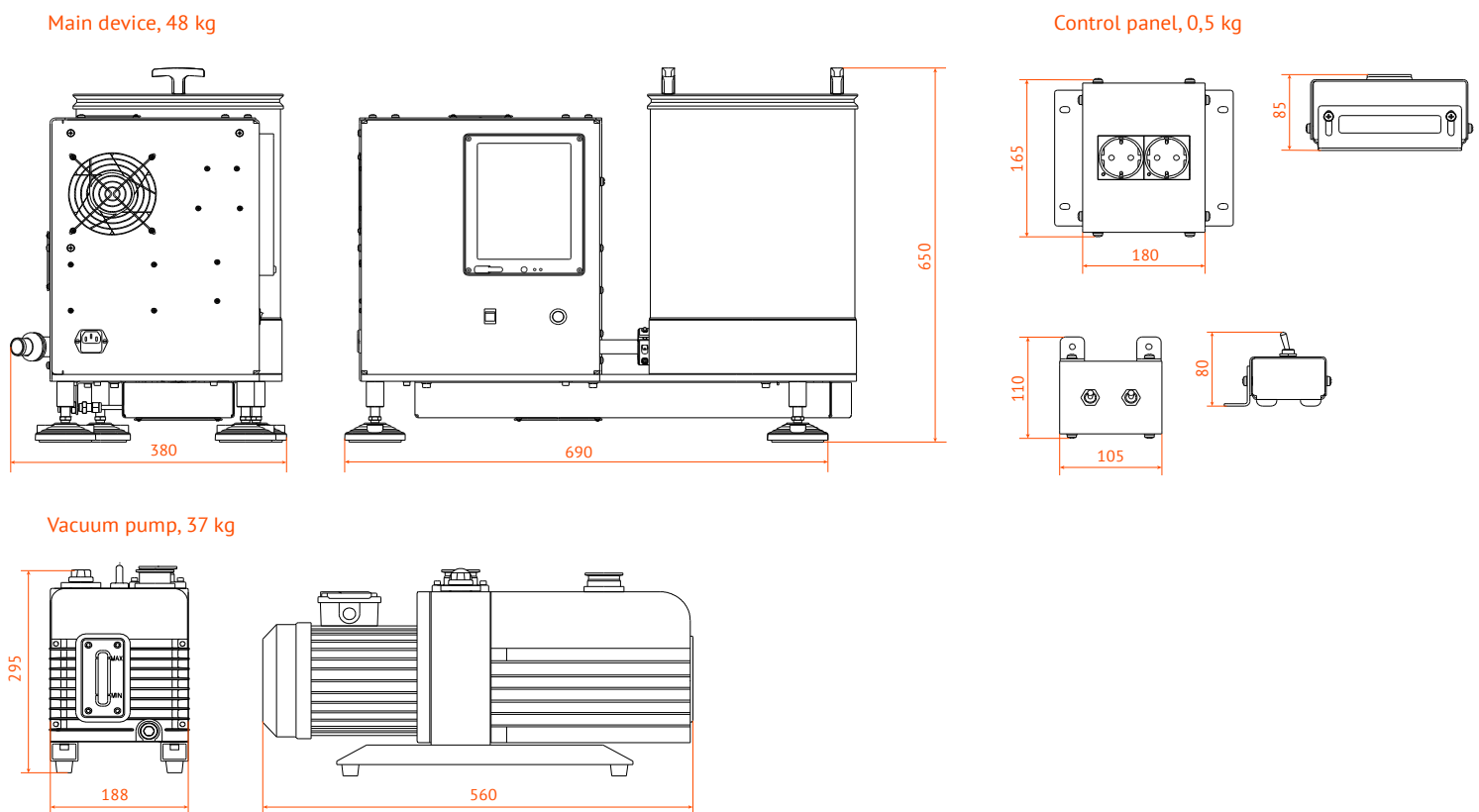
MPA control is realized via touch screen. Moreover, the following data are displayed: PCA temperature, vacuum chamber vacuum pumping process, PCA drive status, PCA position.

PCA is equipped with piston rotating motor; when the piston is in floating position, motor is automatically activated.

PG is used for test pressure measurement in order to feed it to instrument to be calibrated and to reference PCA. For pressure measurement, PG is equipped with built-in pump and volume regulator as well as precision pressure regulating valve system in case the pressure is generated by external sources (cylinders, compressor). Low absolute pressure (when absolute pressure values below atmospheric pressure are measured) in the pressure generator is generated by second backing vacuum pump included in the package set.

In case of gauge-pressure (not absolute one), transparent plastic vessel shall be removed from the vacuum chamber, and vacuum pumps shall not be used. However, all the functions of touch screen and control unit (PCA temperature measurement, PCA motor start, etc.) remain operable. Absolute and gauge-pressure measurement ranges of the same PCA are similar.

Overall dimensions



Certification

Calibration shall be done as per calibration method. Time between calibrations shall be 2 years.

Package

Standard package:

— Main device;

- basement with pressure generator (design depends on measurement ranges required);
- piston-cylinder assembly with selected measurement range;
- mass set in box for storage;
- 2 low-noise high-efficient electrical backing vacuum pumps with vacuum hoses and fittings for connection with MPA basement and pressure generator;
- set of fittings for connection with instruments to be calibrated with the following threads sizes: M20×1.5 — 1 pc; M12×1.5 — 1 pc; G 1/2 — 1 pc; G1/4 — 1 pc;
- set of sealing rubber-metal rings;
- spare parts kit;
- Operation Manual (Data sheet);
- an initial calibration certificate;
- software for automatic calculation of pressure generated and weights and for simulation of external factors influence on the measurement results.

Options:

- additional piston-cylinder assemblies for measurement range extension;
- high pressure generator (only for MPA-100);
- additional mass set, set of non-standard weights;
- mass set resolution decreasing;
- fittings, hoses with special threads for connection with instruments to be calibrated.