Automatic pneumatic absolute dead weight tester v1.0

Application

- ✓ Calibration laboratories
- ✓ Avionics/Aerospace equipment manufacturers
- ✓ Precision pressure sensor manufacturers
- ✓ Calibration service companies and service industry

Features

High-accuracy piston

High-elastic modulus tempered ceramics and tungsten carbide are selected as piston materials to minimize deformation of the piston assembly under ultra-high pressure, effectively improving the accuracy.

Less weights

Adopting a combination of binary mass weights and equal-mass weights to achieve the set mass with the minimum quantity of weight combinations. Non-magnetic stainless steel is used as the weight material, featuring excellent corrosion resistance and wear resistance.

Automatic loading weights

Adopting pneumatic manipulator for automatic loading/unloading of weights, avoiding electromagnetic interference and enabling stable and rapid loading/unloading of weights with required mass.

Description

- The gas piston system is processed using atomic-level material injection and nanoscale planarization processes, ensuring that the gas piston maintains rotational sensitivity for over 30 consecutive working days.
- The combination of weights with the required mass can be automatically calculated and loaded, allowing for skip-type loading of any pressure point (corresponding to the weight combination) within the measurement range. The weight loading/unloading time does not exceed 3 seconds.
- The pressurization, holding, and release of pressure can be automatically achieved through a single-button operation.
- In the absolute pressure gas dead weight tester, a stainless steel cover is utilized to create a vacuum environment, ensuring a long service life, high reliability, and superior air tightness.
- The weights can be lifted with a single-button operation, facilitating the disassembly of the piston assembly and ensuring convenience and efficiency.
- Parameters such as piston position, piston temperature, and weight rotation speed can be sensed and displayed in real-time.
- System errors can be corrected and compensated for by adjusting parameters such as temperature, air buoyancy, and liquid level differences.
- All weights rotate synchronously without wear during loading and unloading, ensuring long-term accuracy of weight measurement.
- The intelligent control algorithm is employed, resulting in a short stabilization time from pressurization to piston position, and the control system exhibits high robustness.
- Check points can be either manually input or automatically generated.
- Equipped with expansion interfaces, it offers robust scalability.
- Safety protection devices are configured, including: piston system anti-breakage rod protection, wrong operation protection etc.

Working conditions

Environmental temperature	(20)1) ℃
Relative humidity	Constant temperature, RH< 80%
Frequency	50.Hz
Power supply voltage	AC 220V

Specifications

Model		PR-ZDQJ006	PR-ZDQJ06
Series		Vacuum 06 series	Vacuum 60 series
Pressure measurement range (kPa)		10~600	100~6000
Minimum pressure interval (kPa)		10	100
Upper measurement limit (kPa)		600	6000
Lower measurement limit (kPa)		10	100
Highest accuracy		0.005%	0.005%
Nominal piston area (cm2)		5	0.5
Hanging basket and piston	Nominal mass (kg)	0.5	0.5
	Nominal pressure (kPa)	10	100
Total weight		100 kg (excluding weights and vacuum pump)	100 kg (excluding weights and vacuum pump)
Maximum limit overall dimensions		600×1500×520mm	600×1500×520mm
Working medium		High-purity nitrogen	

Note:

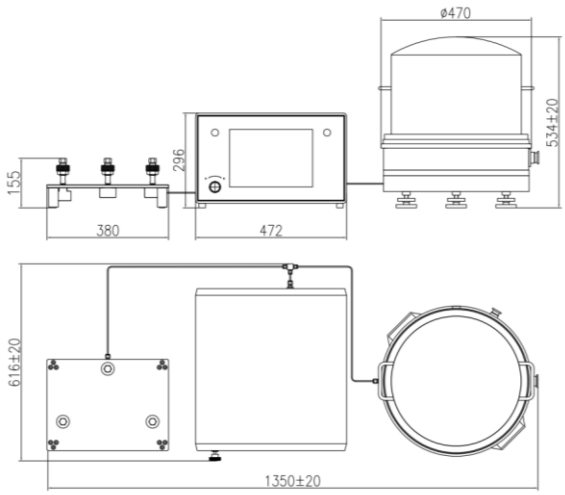
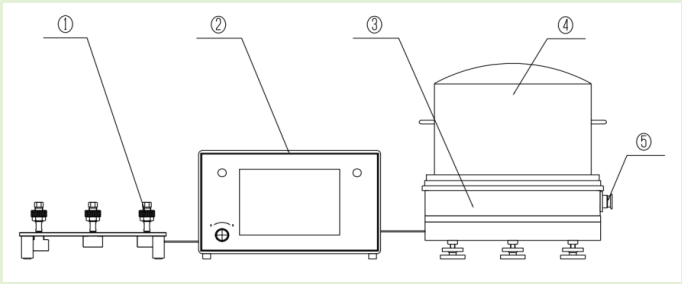
1) When operating in absolute pressure mode, the vacuum within the weight working chamber can reach ≤5 Pa (a molecular pump is recommended).

2) Weight loading/removing l is pneumatically controlled and requires a compressed air source that is clean, dry, and free of corrosive gases. The air pressure must be ≥0.5 MPa (adjustable between 0.2 MPa and the maximum output pressure of the air source).

3) Maximum limit overall dimensions (L×W×H mm): The "length" dimension refers to the measurement when the operator faces the equipment.

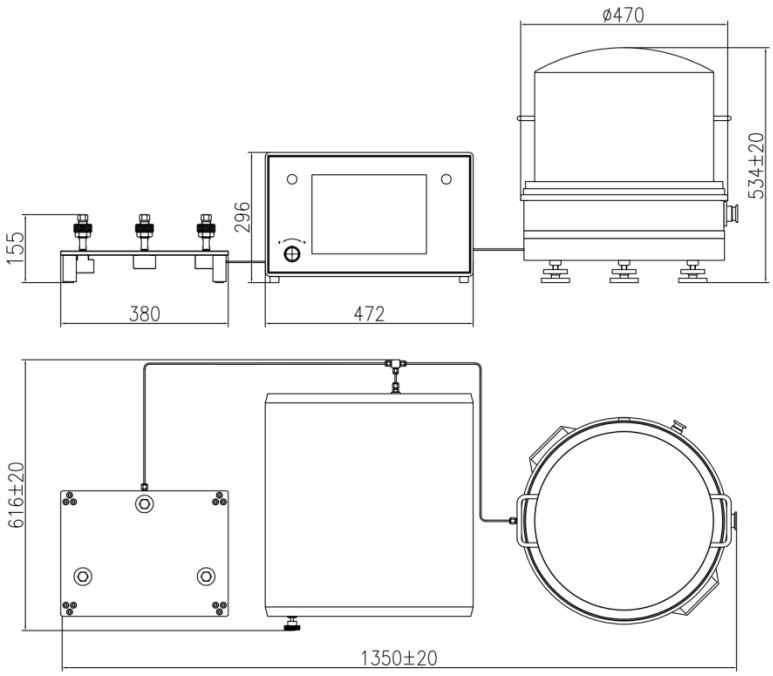
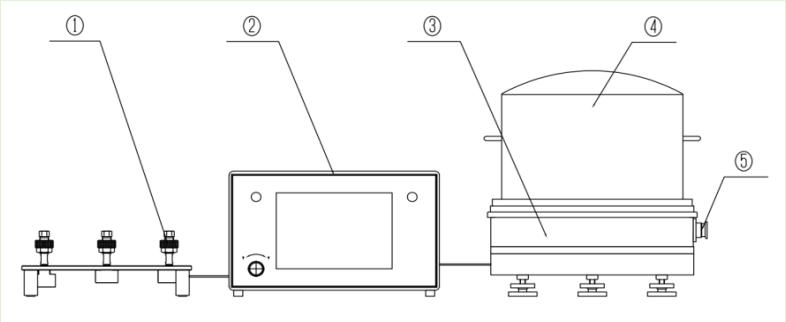
Structure and Dimensions

■ PR-ZDQJ006

Project	Specifications	
Pressure measurement range	(10~600)kPa	
Uncertainty	≤0.005%	
Working Medium	High-purity nitrogen	
Piston material	Tungsten carbide	
Weights	Material	Non-magnetic stainless steel
	Nominal pressure (kPa)	10;20;40;80;160;320
	Nominal mass (kg)	10;20;40;80;160;320
	Quantity of weights	6
Pressure output interface	3/4-16UNF (customizable)	
Dimensions		
Schematic diagram		

① Gauge connecting platform ② Pressure control system
③ Weight loading system ④ Vacuum chamber
⑤ Vacuum port

■ PR-ZDQJ06

Project	Specifications	
Pressure measurement range	(100~6000)kPa	
Uncertainty	≤0.005%	
Working Medium	High-purity nitrogen	
Piston material	Tungsten carbide	
Weights	Material	Non-magnetic stainless steel
	Nominal pressure (kPa)	0.5;1;2;4;8;16
	Nominal mass (kg)	100;200;400;800;1600;3200
	Quantity of weights	6
Pressure output interface	3/4-16UNF (customizable)	
Dimensions		
Schematic diagram		

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Accessories

■ Main Accessories

Item	Quantity and model
Weight loading system	1 set
Pressure generation system	1 set
Weights	1 set (see calibration certificate or factory calibration record for details)
Piston system	1 set (in small aluminum alloy case)
Piston disassembly tool	1 set (3 pieces)
Devices under test calibration base	1 piece
Power cord	1 piece
Air compressor (air pump)	1 set
Hex wrench	1 set
Diisooctyl sebacate	1 bottle
Adjustable wrench	1 piece (12 inches, 34mm opening)
User manual	1 copy
Certificate of approval	1 copy
Calibration certificate	1 copy

■ Vulnerable Parts

Item	Specifications	Quantity
Air pipe	Φ6MM	10.meters (complimentary)
Pulley belt	Φ5 (annular)	1 piece (complimentary)
Gauge connecting seat seal ring	Φ12 (OD) × 2.5 (special for 60 and 250MPa)	20.pieces (complimentary)
Piston bottom seal ring	Φ16 (OD) × 2.5 (special for 60MPa)	20.pieces (complimentary)
	Φ8.6 (OD) × 1.8 (special for 250 and 500MPa)	20.pieces (complimentary)

Standard

- JJG1086-2013Gas piston pressure gauge

Transport dimensions for complete instrument

Product model	Transportation dimensions (length × width × height mm)			Total weight (kg)
	Pressure generation system (solid wood composite panel)	Weight loading system (solid wood composite panel)	Weight case (aviation case)	
PR-ZDQJ006	580×900×610	700×700×930	690×450×340	150
PR-ZDQJ06				150

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