



MODEL 2466

Large Diameter Gas Piston Gauge

- **Large diameter 35 mm Piston/Cylinder**
 - Pressure range: 20 kPa to 1 MPa
 - Tungsten carbide piston/cylinder assembly
 - Cylinder mounting design minimizes external loading forces
- Less than 10 ppm total uncertainty of pressure
- Use with optional Model 2456 Piston Gauge Interface



MODEL 2466

Gas Piston Gauge

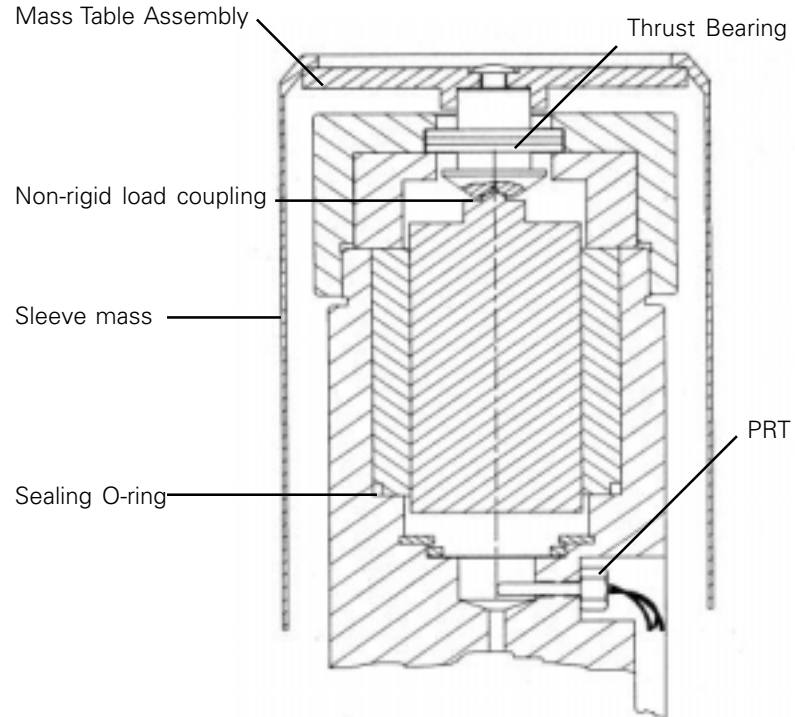
The Model 2466 Gas Piston Gauge features a 35 millimeter diameter piston/cylinder, covering a range of 20 kPa to 1 MPa with a 100 kilogram mass load. The Model 2466 is designed specifically for research activities in which the lowest uncertainties are required with particular emphasis on effective area determination based on dimensional analysis of the piston/cylinder geometries.

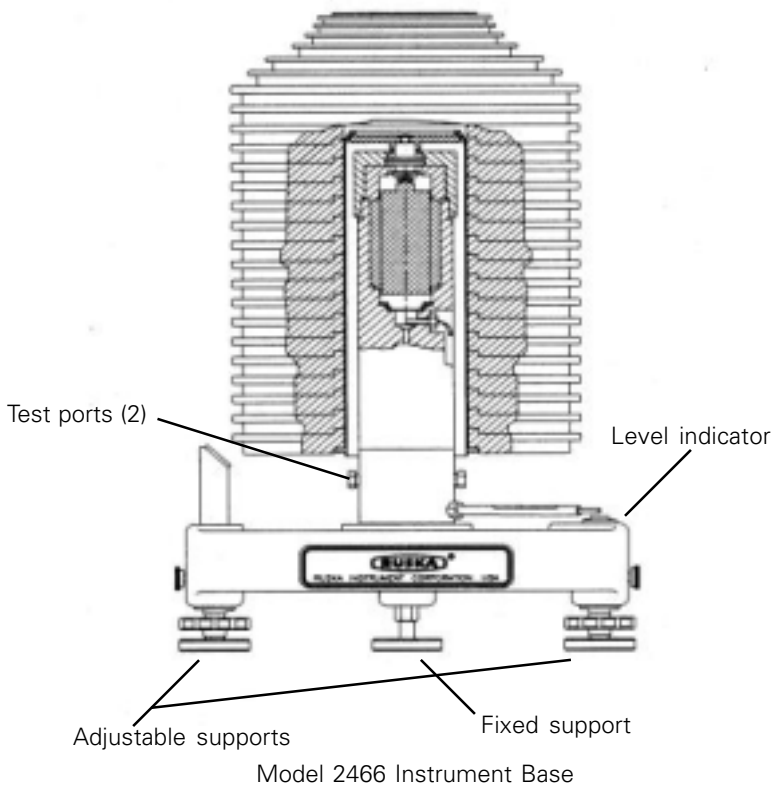
Piston/Cylinder

- Solid Tungsten Carbide, single-piece construction
- Mounting design minimizes external load or forces on cylinder
- Only forces acting on cylinder are those caused by system pressure and minimal axial force required to compress the o-ring seal

Mass Loading Mechanics

- Free rotation, no thermal, vibration or transient force components
- Solid one piece mass construction. No cavities for loose trim material
- Austenitic stainless steel
- Interface of mass load to piston/cylinder is non-rigid; therefore, the mass load is free to pivot maintaining the load mass center of gravity coincident with the piston axis. This design virtually eliminates non-vertical (side loading) forces that may occur due to slight misalignment of load components.
- Mass table assembly is travel limited such that the piston never experiences the mass load except when in the "floating" condition.
- Thrust bearings limit travel of mass loading table and allow the load to be changed without first changing the pressure





Other

- Temperature sensor - 4-wire 100 ohm platinum resistance thermometer (PRT) is located directly below the piston and is immersed in the pressurized gas. This provides the most accurate indication of the piston/cylinder temperature.
- Instrument base utilizes a three-point leveling system, one fixed and two adjustable.
- Facilities for mounting dual inductive type position sensors used for float position detection of the mass stack.
- Level indicator represents piston axis verticality to within 5 minutes of arc (approximately 1 ppm of force).

The new Model 2456 Piston Gauge Interface provides a convenient means of monitoring float position, sink rate and piston temperature. With the optional Air Density Module, the Piston Gauge Interface also monitors ambient temperature, humidity and barometric pressure, which are required for performing the air buoyancy correction.

An Adapter Kit is available for the Model 2466 Gas Piston Gauge (as well as for Ruska's complete line of piston gauges) which includes two float position sensors and a 4-wire PRT. These items are mounted to the Model 2466 and connect to the Piston Gauge Interface. The Piston Gauge Interface then processes this information and transmits it via RS-232 to a PC. Ruska's WinPrompt software is supplied with the Piston Gauge Interface and is used to display the above parameters graphically and numerically on the PC with real time updates.

WinPrompt further extends the capability of the system by providing a means to store all piston/cylinder and mass set calibration data. Combined with real time updates of the environmental parameters mentioned above, WinPrompt also preforms the mass to pressure calculation taking into account all environmental influences on the Model 2466 Gas Piston Gauge. The Model 2456 Piston Gauge Interface with WinPrompt software contributes to automating the operation of the Model 2466 Gas Piston Gauge.



Model 2456 Piston Gauge Interface shown with optional PC

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Specifications

PRESSURE RANGES

Primary Range*: 20 kPa to 1 MPa
Tare Pressure: 20 kPa

*Operating range over which resolution and reproducibility are maintained. See piston/cylinder specifications below.

PISTON/CYLINDER

Configuration: Simple
Nominal Diameter: 35 mm
Material
Piston: Tungsten Carbide (solid)
Cylinder: Tungsten Carbide
Nominal effective area: 962 mm²
Estimated Uncertainty¹: <9 ppm (k=2)
Resolution: <1 ppm
Reproducibility: <3 ppm (k=2)
Thermal Coefficient: 9.1 E-06/°C
Fall rate: <1 mm/minute
Piston Travel: 13 mm
Fixed Engagement Length: 76 mm

MASS SET

Total mass load: 103 kg

Sleeve mass and table (tare)	1 kg
19	5 kg ea.
1	3 kg
1	2 kg
1	1 kg
1	0.5 kg
1	0.3 kg
1	0.2 kg

Tare includes piston, table assembly and sleeve mass

Material: 300 Series austenitic stainless steel (nominal density 7.8 g/cm³)

Construction: Solid, one piece construction. No cavity-filled trim materials are used.

Class 3 trim mass set, 100 g to 5 mg with traceability certificate (NIST) included with main mass set.

ACCESSORIES

Model 2456 Piston Gauge Interface with RS-232 interface, and WinPrompt software. Requires adapter kit which includes two float position sensors with mounting hardware and 4-wire PRT for piston temperature measurement.

Optional Air Density Module is available for use with Model 2456.

Model 2456 Piston Gauge Interface required PC for operation: 166 Mhz or greater, 8 MB ram, RS-232 interface and Windows 95 or later. Program requires 2MB available hard disk space.

GENERAL

Temperature

Operating : 15 to 30 °C
Storage : -20 to 50 °C

Humidity

5% to 95% relative humidity, non-condensing

Dimensions

35 cm x 35 cm (14" x 14") maximum footprint
Total height: 50 cm (20") with full mass load

Test Port Connection

5/16" Autoclave

1 Expression of accuracy (uncertainty) conforms with the recommendations of the ISO Guide to the Expression of Uncertainty in Measurement and includes precision, stability, temperature effects, and the calibration standard.

Due to Ruska Instrument's process of continuous improvements, printed specifications are subject to change without notice.

Other Products and Services

In addition to a wide range of gas and hydraulic piston gauges from 14 mbar to 5000 bar, Ruska also manufactures digital pressure indicators and controllers from 70 mbar to 2750 bar.



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