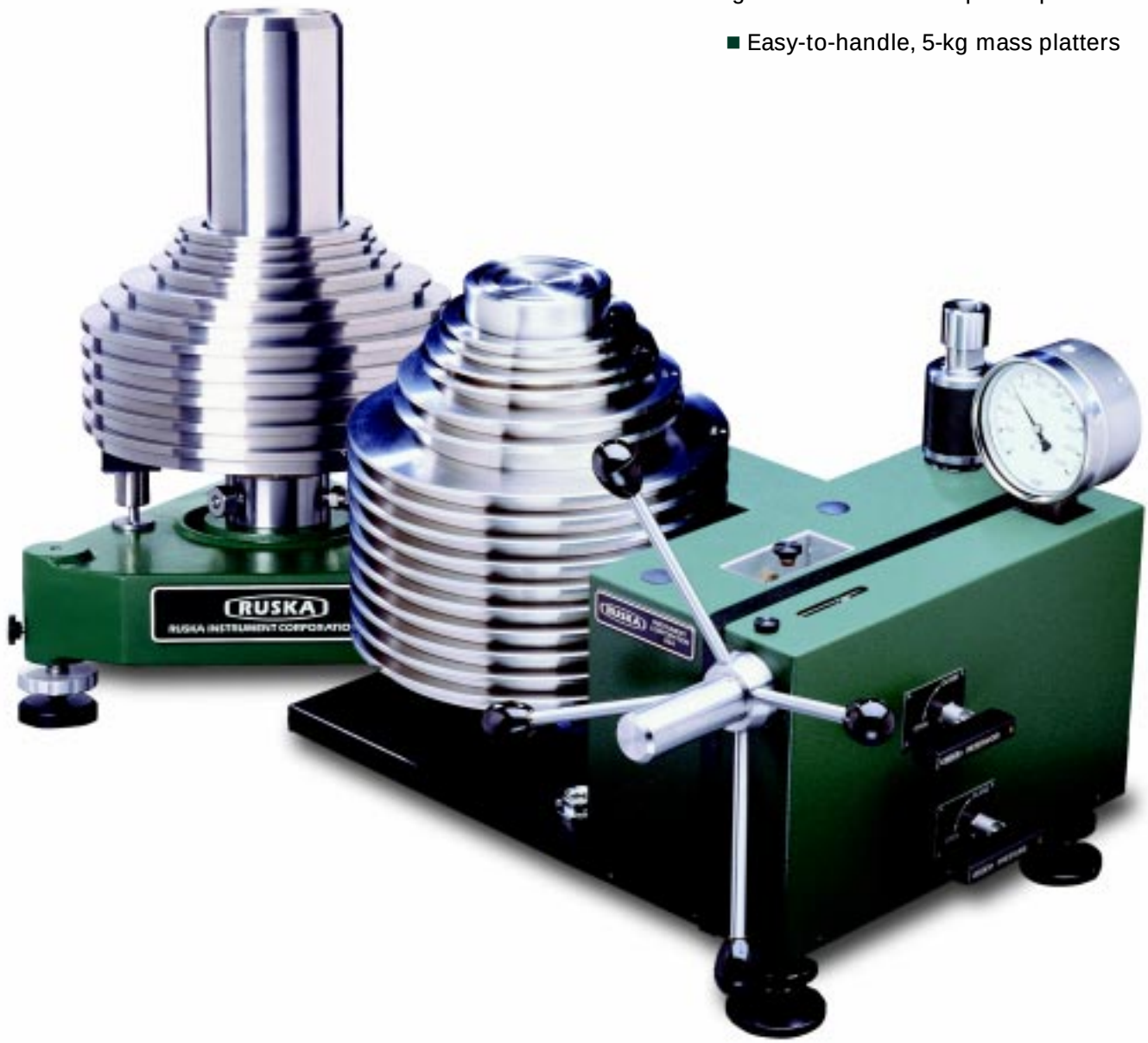
2485

MODEL 2485

Hydraulic piston gauge

- Available as complete benchtop system (right) or upgrade system (left)
- Pressure range from 0.5 to 5000 bar
- Accuracy to 0.0030% of reading
- Resolution less than 1 ppm
- Semiautomated or autofloat options
- Pressure increments in bar
- Unique PistonSafe™system with nonrigid mass loading table for maximum piston protection
- Easy-to-handle, 5-kg mass platters



MODEL 2485

Hydraulic piston gauge

The Model 2485 Hydraulic Piston Gauge is a high precision standard that provides unsurpassed performance in the field of hydraulic piston pressure gauge metrology. The Model 2485 continues Ruska's standard of excellence, building on over 50 years of piston gauge manufacturing expertise. This instrument can be used to calibrate virtually any pressure device including other industrial or portable piston gauges, transducers, transmitters, gauges, or pressure switches. Available in either of two standard media configurations, the Model 2485 can also be used in multiple media systems to facilitate calibrations of the wide variety of instrumentation in use today.

Each Model 2485 system includes a calibration report traceable to the U.S. National Institute of Standards and Technology (NIST). Traceability to other national or international standards organisations is available.

A Compact, Space-Saving Design

The Model 2485 is designed for easy use and the space limitations of today's calibration environment. The entire benchtop system requires less than 0.18 square metres of bench space. The main pressure housing secures the piston/cylinder assembly and provides support for the mass load. Two adjustable support legs and a permanently attached, sensitive level indicator facilitate precise alignment of the piston axis. A fixed support leg directly underneath the main pressure housing supports the load and eliminates platform distortion so that continuous level adjustments are not needed. An auxiliary pressure housing, fluid reservoir, valves, and positive displacement pump are enclosed by a simple cover that is easily removed for servicing internal components. The auxiliary housing also provides a convenient location to connect a device under test.

Other design features include a valve for connecting to an external reservoir (useful for applications where a reservoir larger than 250 mL is needed), and a liquid-in-glass thermometer to aid in compensating for temperature effects. Reservoir and system isolation valves allow for pump recharging while the system remains pressurised, and for discharging when returning the system to atmosphere. The drive motor can be used to provide consistent relative motion between the piston and cylinder when the inertia of a small mass load is insufficient to maintain adequate free rotation time.

Upgrade System

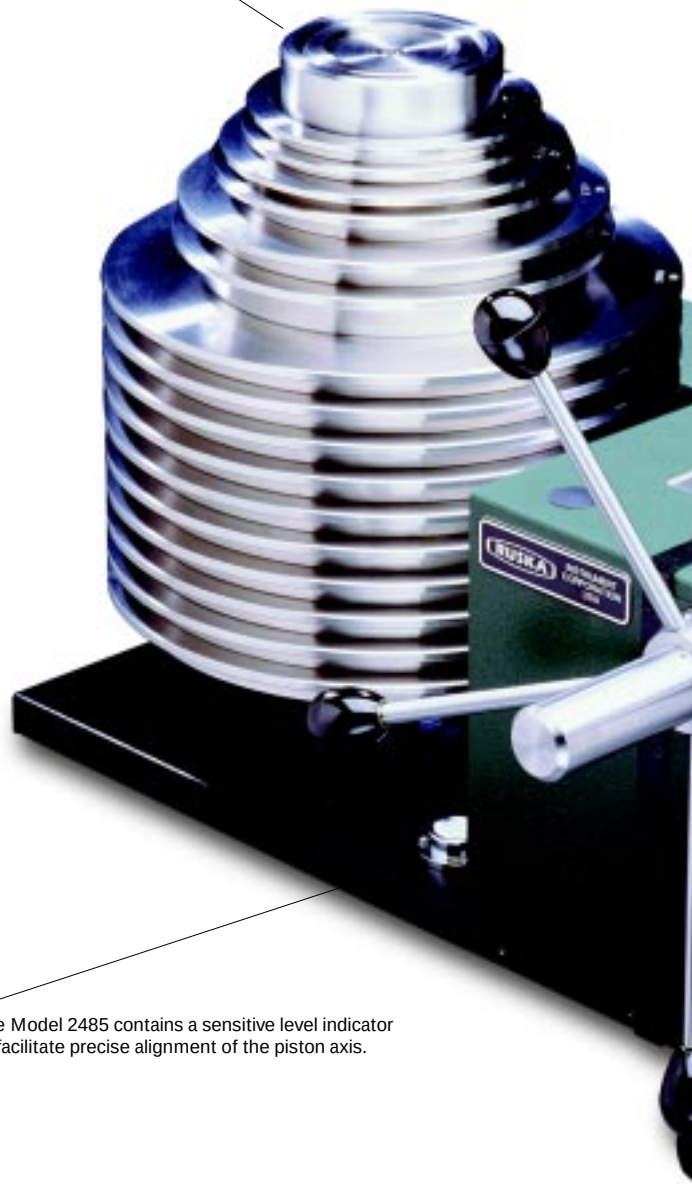
The Model 2485 is offered as a complete, space-saving benchtop unit or as an upgrade system. The Model 2485 Upgrade System is designed to help calibration labs preserve their investment in existing tabletop systems and achieve higher accuracies at an affordable cost. Components of the existing system such as pumps, valves, and the oil reservoir are retained, while the existing piston gauge is replaced with a simplified Model 2485 instrument platform, piston/cylinder assembly(s), and mass set.

Mass Set

The mass set for the Model 2485 includes

- a hanger or sleeve mass, used to keep the center of mass below the piston,
- nineteen 5-kg platters, and
- mass platters in incremental denominations (down to 200 g) for a total of 100 kg.

Mass platters for the Model 2485 are easy to handle—maximum platter weight is 5 kg. Masses are single-piece construction with no loose-fill materials for highest accuracy.



The Model 2485 contains a sensitive level indicator to facilitate precise alignment of the piston axis.

The Model 2485 contains all components needed, including a positive displacement pump, in a compact benchtop system.

Fluid reservoir. The Model 2485 can use Spinesstic 22 (S22) or dioctyle sebacate (DOS) oil as the pressure medium. New style reservoir is available with a quick-fill pump option.

Each mass is adjusted to within 15 ppm of the nominal mass denomination and calibrated to 5 ppm. Each mass is marked with the serial number of the set, a sequence number, and the nominal mass denomination. The mass set is supplemented with a laboratory style trim mass set, with denominations to 5 mg, to generate any pressure within the range and resolution of the instrument.

Piston/Cylinder Assemblies

The Model 2485 piston/cylinder assemblies are simple in configuration and there are no mounting flanges or other geometric irregularities that can result in complicated stresses in the cylinder. This design minimises stress due to mounting and sealing, and allows quick and easy changeout of all ranges without special tools.

The effective area of each Model 2485 piston/cylinder assembly is adjusted so that a given load in kilogram denominations will generate nominal pressure increments in either Imperial (psi) or metric units (bar). All assemblies are identified with a pressure unit/increment designator and serial number.

Quality Materials, Quality Manufacturing

All piston/cylinder assemblies are manufactured from cemented tungsten carbide, offering superior strength and proven durability for

- low distortion,
- virtually undetectable hysteresis,
- excellent long-term stability, and
- a very low thermal coefficient.

The manufacturing techniques used for the Model 2485 piston/cylinder assemblies assure undetectable pressure change due to speed or direction of rotation, resolution better than 1 ppm, a sink rate typically less than 0.25 mm per minute at maximum pressure, and a useable pressure range down to 1% of full scale.

Protecting Your Investment

The Model 2485 features the PistonSafe system, a unique nonrigid system that results in automatic centering of the mass load and protection of the piston/cylinder assembly from forces induced by loading and unloading masses. The system minimises lateral forces, maintains the vertical force along the piston axis, reduces friction, and promotes a higher level of performance than with a rigidly mounted load. The piston and cylinder components are fully protected should the pressure be released while under load, or the load removed while at full pressure. Installation or change of piston/cylinder ranges is quick and easy and can be completed in minutes without special tools.

Options

- Quick-fill pump option for quickly and easily purging hydraulic lines of air before starting calibrations.
- Model 2455 Deadweight Gauge Monitor and WinPrompt® calibration software for more consistent calibrations.
- Autofloat option, with Model 7610 High Pressure Hydraulic Controller, Model 2455, and WinPrompt software.

MODEL 2485

Specifications

GENERAL

Pressure range (bar)
0.5–1000, 0.5–5000 with high pressure intensifier
Ranges in MPa available, consult factory

Accuracy*
0.5–50 bar: 30 ppm of reading or 2 ppm of full scale
5–500 bar: 45 ppm
10–1000 bar: 45 ppm
75–5000 bar: 100 ppm

Electrical power
115/230 VAC, 50/60 Hz, 15 W

Temperature
Operating temperature 18–28 °C; storage temperature 20–50 °C

Humidity
Operating: 20–75% relative humidity, noncondensing; storage: 0–90% relative humidity, noncondensing

Dimensions
51 cm H x 51 cm W x 36 cm D

Weight
40 kg (excluding masses)

Pressure medium
Spinesstic 22 (S22) or dioctyl sebacate (DOS) oil

MASS SET

Construction
Single-piece construction, 26 pieces plus trim set of nonmagnetic, austenitic, 300 Series stainless steel with no loose-fill materials

Calibration
Trimmed to 15 ppm of nominal, calibrated to 5 ppm

Weight
Set: 100 kg
Maximum platter weight: 5 kg
Cases: first case 16 kg, other cases 23 kg

Case dimensions
First case: 34 cm H x 33 cm W x 25 cm D
Other cases: 32 cm H x 33 cm W x 20 cm D

PISTON/CYLINDER ASSEMBLIES

Materials
Cemented tungsten carbide

Thermal coefficient
9.1E-06/°C

Resolution
Less than 1 ppm, or 20 mg

Precision
Less than 5 ppm (2σ typical)

Stability (per year)
Less than 5 ppm

OPTIONS

Quick-fill pump

Model 2455 Deadweight Gauge Monitor

WinPrompt calibration software

Model 7610 High Pressure Hydraulic Controller (for autofloat capabilities when used in combination with Model 2455 and WinPrompt)

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

* Accuracy as used here is defined as the 2-sigma root-sum-square Total Uncertainty in Pressure as determined from the method described in ISO "Guide to the Expression of Uncertainty in Measurement," and represents a 95% level of confidence. These claims are subject to limitations in the state-of-the art uncertainty where available in pressure measurement at NIST and on strict procedure, training, and environmental controls at the location where used.

Other products and services

Ruska manufactures a range of piston gauges for pressures from 14 mbar to 5000 bar and digital pressure controllers from 0.07 to 2750 bar, air data test sets, and portable pressure indicators. Ruska also offers a complete line of fluid phase behaviour instrumentation and ancillary items, mass-sorption systems (McBain-Bakr apparatus), and custom quartz component design and manufacturing. Repair and recalibration services are available to support our equipment worldwide. Regular training courses are held in Houston, Texas for all Ruska products.

Ruska provides a complete line of digital pressure controllers and gauges/indicators for automated pressure test and measurement.

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