Model 2456 WinPrompt®
Piston Gauge Monitor and Software

Technical Data

Features

- Automates piston gauge calibrations
- Monitors critical piston gauge parameters in real time
- Dual channel capability for crossfloat calibrations
- WinPrompt software is Windows®–based
- Use WinPrompt alone or in combination with piston gauge monitor for optimum automation
- Export data to create calibration certificates and reports

Accounting for environmental factors when performing piston gauge calibrations is an important but labor intensive process. Ruska's Model 2456 piston gauge monitor (PGM) and WinPrompt calibration software help automate this process. The Model 2456 enhances measurement precision and consistency of critical piston gauge parameters including piston gauge temperature, float position, sink rate, air density, vacuum and other variables.

Temperature

The Model 2456 uses precision four-wire platinum resistance thermometers (PRTs) to monitor the piston gauge temperature. It actively monitors two PRTs and stores coefficients for up to ten. This minimizes the risk of damage to sensitive PRTs by allowing the operator to move the Model 2456 to another piston gauge location without moving the PRTs.


Float position

Non-contact, inductive proximity sensors in the Model 2456 accurately read the float position of the piston gauge to a resolution of 0.025 millimeters (0.001 inch), which is significantly greater than the readability of the unaided eye.

Sink rate

Sink rate is often used as an accurate indication of thermal stability, and for detecting leaks in the system that result in pressure measurement errors. In crossfloat applications, sink rate becomes a high resolution indicator of the differential pressure existing between two piston gauges. Routinely monitoring the sink rate of your piston gauge promotes consistency and confidence in your pressure calibrations. The sink-rate-versus-time display is vital for evaluating system integrity and stability.

Air density

The optional laboratory environment monitor (LEM) actively monitors relative humidity, barometric pressure, and ambient air temperature. The Model 2456 reads these signals and performs a real time computation of the density of the air surrounding the masses on the piston gauge. WinPrompt calibration software computes the buoyant effect of the ambient air on the piston gauge masses, and computes adjustments to the pressure or mass accordingly.
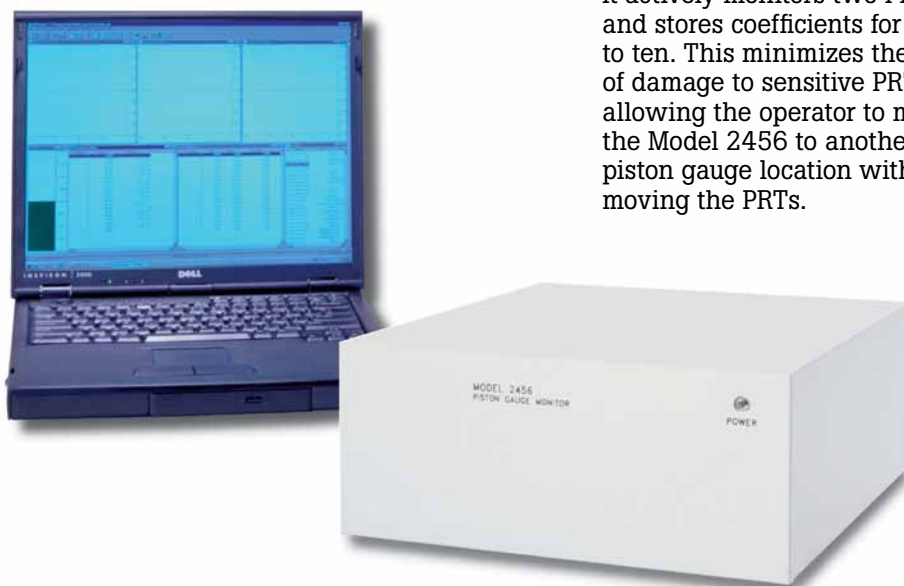
Vacuum module

The optional vacuum module is typically used with the Model 2465 gas piston gauge when operating in absolute mode and monitoring the residual bell jar pressure is required. The 2456 allows real time monitoring of the vacuum and is used with WinPrompt to make appropriate corrections to the pressure–mass calculations.

Units

Select from the following units of measurement:

- Temperature: °C or °F
- Float position: cm or in
- Barometric pressure: inHg, kPa, mbar, psi, kg/cm^2, mmHg, or cmHg
- Vacuum: µHg or mTorr
- Density: g/cm^3, kg/m^3, lb/in^3
- Sink rate: in/min or cm/min

WinPrompt Calibration Software

WinPrompt calibration software increases calibration efficiency by providing full–color, Windows–based measurement for your process. This easy-to-use software can be used independently or in conjunction with the Model 2456. In either instance, WinPrompt provides the capability for customizing calibration procedures and reports.

Data storage

WinPrompt stores the calibration coefficients for your working standards, including piston/cylinder effective area, thermal coefficient of expansion, pressure deformation coefficients, and all calibrated mass values and associated density. It also stores all of the critical system and environmental parameters, including local gravity, head corrections, and air density.

Calculations and conversions

WinPrompt performs all necessary calculations of pressure–to–mass and mass-to–pressure in both metric and English units. When using the Model 2456 and the LEM, WinPrompt computes the buoyant effect of the ambient air on the piston gauge masses, and compensates accordingly.

Procedures

WinPrompt provides the ability to create calibration procedures for performing repetitive type calibrations. Multiple pressure values can be created in a table and each window (i.e. float position, temperature) can be sized, positioned and saved as a procedure.This can be recalled anytime the calibration is being performed.

Report formatting

Calibration reports can be exported in ASCII format and then imported into popular commercial spreadsheet and word processing software programs to generate customized, formal calibration reports. Set up your own calibration report templates in Microsoft Word®, Excel®, or other popular programs, adding your organization's logo and other information to simplify and automate professional looking reports.
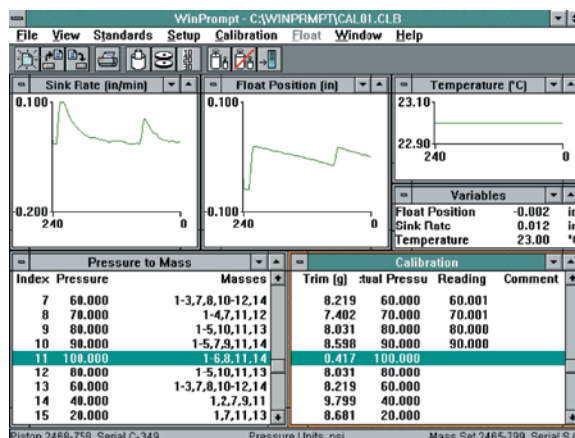
WinPrompt is acquiring information from the piston gauge through the piston gauge monitor and displaying it in real time. The data is being used to automatically adjust the pressure/mass values.
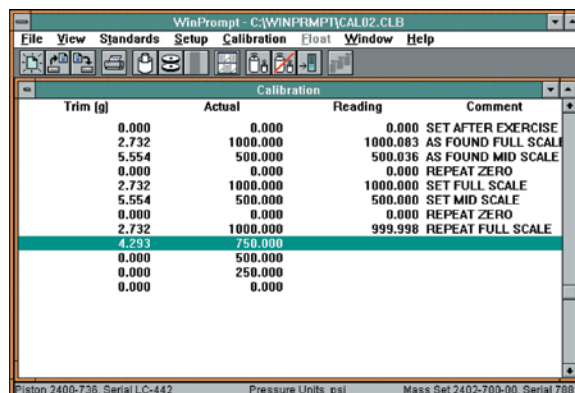
The WinPrompt calibration screen displays calibration values and allows for user comments. Export this information using dynamic data exchange (DDE) into your favorite word processing or spreadsheet program to create calibration certificates and reports.

Specifications

General	
Available in single or dual channel configuration using WinPrompt calibration software	
Electrical power	100/250 V ac, 50/60 Hz
Temperature	Operating temperature: 36 °C to 18 °C (64.4 °F to 96.8 °F) Storage temperature: −20 °C to 70 °C (−4 °F to 158 °F)
Humidity	5 % to 95 % RH, non-condensing
Weight	3.81 kg (8.4 lb)
Dimensions (H x W x D)	106.68 mm x 299.72 mm x 251.46 mm (4.2 in x 11.8 in x 9.9 in)
Float position	
Sensor type	Inductive
Resolution	Sink rate: 0.001 in/min or 0.001 cm/min
Float position	0.001 cm or in
Number of sensors	One to four (up to two sensors per piston gauge, total of two piston gauges)
Calibration range	Approximately 0.13 cm to 1.9 cm (0.05 in to 0.75 in)
Piston/cylinder temperature	
Probe type	Four-wire 100 W PRT
Resolution	± 0.1 °C (32.18 °F)
Accuracy	± 0.1 °C (32.18 °F) (conforms with ITS-90)/year
Number of Sensors	One or two
Calibration	A calibration report providing traceability to National Institute of Standards and Technology (NIST) is provided with each PRT
Vacuum module (optional)	
Resolution	1 mTorr
Accuracy	10 % of reading or 10 mTorr, whichever is greater
Number of sensors	One or two
Sensor type	Silicon, micromachined thermal conductivity
Calibration	A calibration report providing traceability to NIST is provided with each vacuum module
Communications	
RS-232 Interface	
Laboratory environment monitor (optional)	
Accuracy	Temperature: ± 0.5 °C/year Humidity: ± 10 % relative humidity/year Pressure: ± 2 mmHg/year
Calibration	A calibration report providing traceability to NIST is provided with each air density module LEM.
WinPrompt Calibration Software	
Hardware requirements	Minimum 80386 33 MHz processor; 8 MB RAM; program requires 2 MB available hard disk space and available RS-232 Interface
Software requirements	Microsoft Windows version 3.1 or later. Also compatible with Windows NT

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