



7000/7010

MODEL 7000/7010

Precision pressure indicator/Precision pressure controller

- Full scale pressure range to 170 bar
- Gauge, vacuum, and absolute modes
- Precision to 0.003% of full scale
- Control stability to 0.001% of full scale
- Stability: 0.005% of reading/6 months
- Fully programmable
 - Ruska Series 6000 emulation
 - LabVIEW® driver available



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Precision pressure indicator/Precision pressure controller

The Model 7010 Precision Digital Pressure Controller and Model 7000 Digital Pressure Indicator provide the highest possible level of performance available today in a digital pressure standard.

Precision and Stability

The Model 7010 incorporates Ruska's force-balanced, fused-quartz Bourdon tube transducer. Quartz is a perfectly elastic material, providing the transducer with very low hysteresis, excellent repeatability, and long term stability. Using the advantages of our force-balanced design and the special properties of fused quartz, we create a unique pressure transducer with unsurpassed precision and stability.

Precise Pressure Control

The Model 7010 uses the advantages of preregulated servo valve technology to precisely achieve the desired pressure setpoint, with zero overshoot.

Automating Pressure Test and Calibration

The Model 7010 is easy to use and automates your calibrations in several ways.

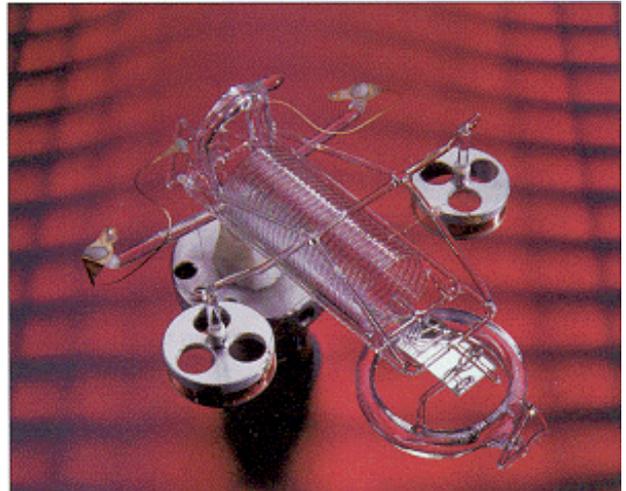
Step up/down - for calibrations where the increments are fixed intervals, enter a user-defined step value. The Model 7010 increases or decreases the pressure by the step amount with a single keystroke. No more lengthy keystroke sequences to program.

Sweep test - for simple exercising routines, as with dial gauges, enter a start value, a stop value, and number of times to repeat the cycle. The Model 7010 will automatically exercise the device under test prior to the calibration run.

Onboard programmes - for frequently used or lengthy calibrations, the Model 7010 can store up to 20 user-defined programmes/profiles with up to 1000 steps total in the internal memory. If more are needed, a PCMCIA memory card can be used to create a library of test routines that can simplify your procedures.

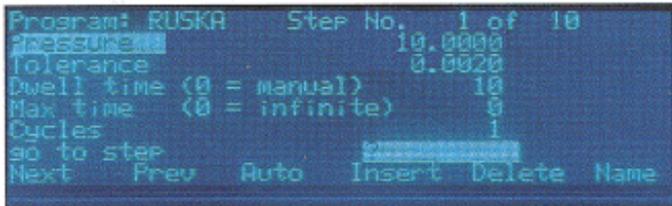
Computer interface - every Model 7010 is provided with both an RS-232 and IEEE-488 interface, and the Model 7010's syntax follows SCPI protocol for easy programming. A LabVIEW driver is also available. As a standard feature, software written for Ruska's previous generation Series 6000 instruments is fully supported by the Model 7010.

Multirange systems - the Model 7010 can be configured in custom, multirange systems for a high level of performance over a wide pressure range. These multirange systems, which may include from three to eight separate controllers, provide single operator and computer interfaces and a common test port.



The Model 7010 features Ruska's own force balanced, fused-quartz Bourdon tube. No other transducer matches its performance: precision to 0.003% of full scale and stability to 0.005% of reading over six months.





The setup screen for the Model 7010. The screen is identical for the Model 7000 Digital Pressure Indicator.



The programme screen for the Model 7010. Up to 20 separate programmes, with a total of 1000 steps, may be saved in internal memory.



Versatility to handle almost any pneumatic pressure calibration

The Model 7010 is versatile enough to handle almost any type of pneumatic pressure calibration.

Wide pressure range - the Model 7010 is available in a variety of standard or custom pressure ranges for measuring and controlling pressures from 0 to 170 bar.

Pressure units/scales - select from over twelve standard units of measure, including inHg at 0 and 60 °C, kPa, bar, psi, inH₂O at 4 °C, 20 °C, and 60 °F, kg/cm², mmHg at 0 °C, cmHg at 0 °C, and cmH₂O at 4 °C, or define up to two additional units.

Head pressure - the Model 7010 automatically corrects for given head pressure differences.

Autovent and autozero - with a few keystrokes, the Model 7010 will vent the test port to atmosphere or automatically zero itself (autovent is not applicable for permanent absolute mode).

Protection of the device under test - set upper and lower pressure limits to ensure protection of the device under test.

The Model 7010 is configured for gauge or absolute mode operation in full scale pressure ranges from 160 mbar to 170 bar. An optional vacuum (negative gauge) mode option for bidirectional devices is available for full scale pressure ranges from 70 mbar to 34 bar.

- The Model 7010 is also available in a permanent absolute mode configuration for ranges from 1 to 6 bara full scale. A tare feature is included for simulated gauge mode operation.
- Low pressure ranges (70 to 337 mbar full scale) are configured for gauge mode operation, with optional vacuum mode available.

The Model 7000 Digital Pressure Indicator is available for measure-only applications that call for the ultimate in precision.

The Model 7010 Precision Digital Pressure Controller can easily automate your test and calibration workload. The Model 7000 Precision Digital Pressure Indicator is the highest precision measure-only instrument available. These instruments are easy to use, easy to maintain, and have the reliability, the performance, and the features that you want.

Ruska Instrument-setting the standard since 1944.

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Specifications

GENERAL

Standard pressure ranges (full scale, bar)

Gauge: 100 mb
 Gauge/absolute: 160 mb, 250 mb, 400 mb, 600 mb, 1.0, 1.6, 2.5, 4.0, 6.0, 10.0, 16.0, 25.0, 40, 60, 100, 160
 Permanent absolute (includes tare feature): 1.0, 1.6, 2.5, 4.0, 6.0

Optional pressure ranges

Any full scale range from 70 mb to 170 bar

Optional mode

Vacuum (available for gauge and gauge/absolute instruments from 70 mb to 34 bar FS)

Display

Graphical vacuum fluorescent

Electrical power

90-260 VAC, 50-400 Hz, 150 W (for instruments to 34 bar FS)
 For instruments above 34 bar FS:
 102-120vac, 60 Hz, 150W or 102-110 VAC, 50 Hz, 150 W
 204-240 VAC, 60Hz, 150 W or 204-220 VAC, 50 Hz, 150 W

Temperature

Operating temperature 18-36 °C; storage temperature -20 to 70 °C

Humidity

5-95% relative humidity, noncondensing

Nominal control volume

82-980 cc

Test port pressure test

150% of full scale to 70 bar; 125% of full scale to 170 bar, ¼-inch NPTF

Dimensions

17.78 cm H x 43.18 cm W x 40.64 cm D

Weight

15.9 kg (20.4 kg for instruments 35-170 bar)

PERFORMANCE

Precision

Standard: 0.003% FS (0.34-170 bar) including temperature effects over the operating temperature range*. Low range (70-337 mb FS) precision is 0.004% FS

Stability

0.005% RDG/6 months (0.01% RDG/ 1 year)

Zero drift

0.004% of full scale/24 hours (eliminated by rezeroing)

Display resolution

User-selectable to 1:1,000,000

Warm up time

2 to 3 hours, may be left on indefinitely

Pressure medium

Dry, clean air or nitrogen

Supply pressure

Maximum of 20% above full scale pressure range

TRANSDUCER

Force-balanced, fused-quartz Bourdon tube. Shock tolerance 15 g/8 ms

PNEUMATICS

Overpressure protection

Relief valves: test port set at 110% FS, reference port set at 0.7 bar g, supply pressure port set at 120% FS, vacuum port set at 0.7 bar g software limits (set by user)

COMMUNICATIONS

RS-232 and IEEE-488; syntax: SCPI: Ruska Series 6000 emulation: LabVIEW driver available

PCMCIA card interface provides additional programme storage and capability for field firmware/software upgrades

CALIBRATION

A calibration report providing traceability to the National Institute of Standards and Technology is provided with each instrument. Calibration is performed using the Model 2465 Gas Piston Gauge or the Model 2470 Piston Gauge System.

Recommended calibration interval is six months to one year

OPTIONS

Memory card
 Rack mount kit

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

* Precision is defined as the combined effect of linearity, repeatability, and hysteresis throughout the operating temperature range.

Other products and services

Ruska manufactures a range of deadweight gauges for pressures from 14 mbar to 5000 bar, 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.

Full scale pressure range	Instruments from 70-337 mbar	Instruments from 338 mb-7 bar	Instruments from 7-35 bar	Instruments from 35-170 bar	Instruments from 1-7 bara
Control stability	0.004% FS	0.001% FS	0.001% FS	0.004% FS	0.001% FS
Control low limits (G, A, V)	0 bar g ¹ N/A 100% FS	0 bar g ¹ 103 mba or 1% FS ² 95% of barometric	0 bar g ¹ 1% FS 95% of barometric	10% FS 10% FS N/A	N/A 103 mba or 1% FS ² N/A
Gas Consumption (steady state)	<8 L/min	<8 L/min	<20 L/min	<10 L/min	<8 L/min
Slew rate ³	30 seconds	30 seconds	45 seconds	60 seconds	30 seconds
Test port isolation	standard	standard	standard	optional	standard

G=gauge, A=absolute, V=vacuum

¹ requires vacuum pump to control to 0 bar g, or autovent feature ² whichever is greater ³ defined as 10% FS increment into 245 cc volume



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