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GE
Sensing

Features

- Pressure ranges 10 in$H_2$0 to 3000 psig (210 bar)
- Precision 0.01% Full Scale (FS)
- Control stability 0.001% of span
- User friendly, high-speed control
- Unique, patented control system
- RS232 and IEEE 488 communications

The DPI 515 high-speed precision pressure controller/calibrator is the most advanced instrument of its type. It incorporates many new features and enhances all the core functions of GE's previous best- selling pressure controllers.

DPI 515

Druck Precision Pressure Controller/Calibrator

DPI 515 is a Druck product. Druck has joined other GE high-technology sensing businesses under a new name– GE Industrial, Sensing.



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Innovation

The latest measuring and control technology is incorporated into one compact, functional instrument. Multiple processors, advanced software and a large area display are among a host of features that make the DPI 515 the most flexible controll the market, along with simplified operation and reduced maintenance.

This is the first controller of its type to offer automatic control valve compensation, giving dependable operation over long, sustained periods of use with a variety of system pressures and volumes. Special attention has been given to ensure suitability for bench use, with recessed retractable feet to provide a comfortable viewing angle, or for 19 in (483 mm) rack installation using the optional rack mounting kit.

Measuring

GE's ability to design and manufacture both sensor and instrument has resulted in a powerful combination of silicon sensor and digital compensation. Precision of 0.01% FS enables high accuracy calibration over a wide range. Long term stability and temperature effects have been significantly improved and re-calibration simplified. High resolution (typically 1 ppm) measurement is achieved with high performance, self-calibrating electronics and a full seven-digit display.

Control

The DPI 515 patented (patent numbers: EP0710905A1, US315540-101 and UK2295249) digital control sets a new standard for control performance with fast response, no overshoot and unsurpassed setpoint stability, better than 0.001% of span.

At setpoint the controller continues to operate with low noise, wide bandwidth and the result is an almost immeasurable pressure ripple and stable pressure control unique to this method.

The fast control loop automatically compensates for small leaks and thermal changes within the system. Significant leaks should be avoided for calibration applications, so the DPI 515 continuously monitors the pressurized system, indicating leaks on the unique 'activity Indicator.

Quality

GE is ISO 9001-approved, with all instruments manufactured to strict quality control procedures and calibrated against international traceable reference standards, such as the National Institute of Standards and Technology (NIST) and NPL, NVLAP and UKAS. Certification is available upon request.

Simplicity

The DPI 515 is simple to operate, even for those unfamiliar with pressure calibration or control. The intuitive menu-style software allows quick selection of the required function, ensuring that within minutes, calibrations can be performed with ease and confidence.

High-Speed Calibrations Can be Performed With Ease and Confidence.

The DPI 515 offers high productivity and improvements in accuracy and quality, with faster calibrations on multiple units or in-line processes. It's the perfect tool for high speed automation.

Installation

The DPI 515 is designed for 19 in (483 mm) rack systems using an optional rack mounting kit. For benchtop use, retractable and recessed feet are fitted as standard, providing a comfortable viewing angle for the operator.



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Functions

The following pressure measurement and control functions can be readily selected from the DPI 515 user menu:

Dual Range
This option extends both the measuring and control accuracy of the DPI 515. For this feature the unit is equipped with a second pressure sensor and a control manifold is fitted. Uniquely, both ranges are fully independent, providing control stability based on each individual FS range. Any two pressure ranges may be selected. Each range is mechanically independent, with its own dedicated input and output pressure port connections, and can be selected either manually or automatically.

Barometric Reference
A high-precision barometric sensor option can be installed, which enables gauge pressure ranges to be converted into absolute pressure values. Precision is determined by the addition of the barometric reference precision to that of the pressure range being used.

This option increases the versatility of the pressure controller, allowing it to perform both gauge and absolute pressure control/calibration with the same instrument.

Selecting gauge pressure ranges and using the barometric reference for absolute pressures ensures easy zeroing by eliminating the need to apply a vacuum reference.

Pressure Switch Testing
This function permits automatic and accurate calibration of pressure switches for opening and closing pressure values, displaying all associated data, including hysteresis.

Leak Testing
This function automatically measures leak rates in the desired units/minute. Once the control system achieves the required pressure, the controller is isolated, leaving the measurement software to record any system leaks over the specified time period.

Test Program
For those who perform regular calibration routines or process procedures, a facility is included to write and save up to sixteen test programs. This saves time and reduces procedural errors.

Span Divider
For quick calibration, each soft key is defined as equal divisions of a specified pressure span; alternatively, the soft keys can be set quickly to 10% points.

Preset
For quick calibration, each soft key can be defined as an individual pressure setpoint value.

Control Rate
The response of the pressure controller is adjustable for fast, no overshoot and variable. This allows user selection according to the speed and sensitivity of the application, for example, “no overshoot” for a valid hysteresis calibration of dial gauges.

Pressure Units
Twenty-four pressure units are supplied as standard, the six most popular of these may be set up for quick selection by the soft function keys.

Aeronautical Units
Full control is available in aeronautical units, altitude in feet/meters, airspeed in knots, km/hr, Mach and rate of climb in ft/min and m/min.

Multi-language
The instrument display can be selected to read in English, French, German, Italian, Portuguese or Spanish, according to the user preference.

Jog
The setpoint can be moved in small incremental steps using the rotary control, for example, to determine exact cardinal points on dial gauges.



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Head Correction
The pressure change due to vertical heights between the unit under test and the DPI 515 can be simply compensated.

Zeroing
Verification of the instrument zero is made simple by the provision of two methods: manual zero and timed auto- zero. For manual zeroing, any pressure zero offset can be corrected by a key press. For timed auto-zeroing, the instrument may be programmed to zero itself automatically at a desired time interval.

Logic Input and Outputs
The input allows direct connection of pressure switch contacts for pressure switch testing, while the two outputs can be used to control external devices according to instrument state or remote computer command.

Filtering
Digital filtering can be selected if required, which simplifies the reading of fluctuating pressures.

Instrument Status
The calibration and maintenance history of the DPI 515, along with its configuration, are stored within the instrument. The calibration history is automatically updated each time a calibration is carried out. This ensures information remains permanently with the instrument, to satisfy quality assurance requirements.

Operating Limits
The controlled pressure range can be restricted to protect the device under test from either over- or under-pressure. Alternatively, alarm limits can be set to provide an audible warning.

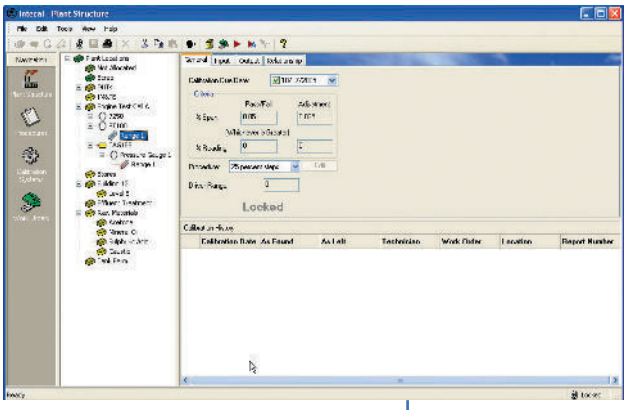
Sensor Calibration Module
Optional input card supplies 10V regulated or 24V unregulated sensor excitation. This reads in mV, mA or volt output from the pressure sensor under test. It provides full closed loop calibration on pressure sensors.

Calibration Management

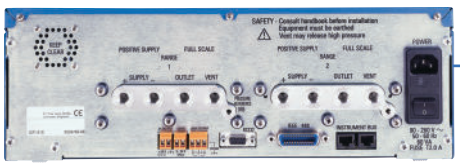
Communication
RS232 and IEEE 488 are standard in the DPI 515, allowing easy remote control and configuration for integrated computer driven systems. The popular Standard Commands for Programmable Instruments (SCPI) protocol is used to provide standardization with other instruments. In addition, DPI 500, DPI 510, DPI 520 and Ruska 7000 Series emulation is available, as well as Labview® drivers. Example programs for Labview, C++ and VBasic are available at www.DPI515.com.

Software
GE Intecal is a Windows®-based calibration management software designed for the support of both laboratory and field-based calibrations. The extensive management and analysis features included can interface with many popular GE instruments such as the DPI 510, DPI 515, DPI 520, DPI 605, DPI 610 and MCX to offer a complete and quality assured solution to calibration management.

Connections
All pneumatic and electrical connections are situated on the rear panel of the instrument for neat and easy installation.







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DPI 515 Specifications

Pressure Measurement

Standard Pressure Ranges
- 10 inH_2O (25 mbar) gauge
- 1 and 3 psi (70 and 200 mbar) gauge
- 5, 10, 15, 30, 50, 100, 150, 300, 500, 1000, 1500, 2000, 3000 psi (350 mbar, 700 mbar, 1, 2, 3.5, 7, 10, 20, 35, 70, 100, 135 and 210 bar) gauge

Gauge versions are available with negative gauge calibration as an option. For absolute pressure ranges, specify option (A). Barometric Reference. Absolute pressure ranges are above plus atmospheric pressure.

Over Range
10% above full scale pressure range (measure mode only)

Pressure Media
Dry, oil free, non-corrosive gas. Dry air or nitrogen recommended.

Display

Panel
Large area, high-contrast, emissive graphics LCD

Readout
±9999999 maximum, updated 2 times per second

Pressure Units
24 scale units plus one user-defined

psi, bar, mbar, Pa, hPa, MPa, kgf/cm^3, mmHg, cmHg, mHg, inHg, mmH_2O, cmH_2O, mH_2O^{20}, inH_2O^{04}, inH_2O^{60}, ftH_2O^{20}, ftH_2O^{04}, lb/ft^2, torr, atm, special

Languages
English, French, German, Italian, Portuguese, and Spanish

Performance

Precision
- Precision 0.01% full scale from 10 psi to 3000 psi (700 mbar to 210 bar)*
- Precision 0.03% full scale below 10 psi (700 mbar)*

*Precision includes non-linearity, hysteresis, repeatability and temperature effect between 65°F and 85°F (18°C and 28°C), for both absolute and gauge pressures. Plus 0.004% full scale for 50°F to 115°F (10°C to 45°C).**

Calibration standard (deadweight tester) accuracy 0.005% of reading

Negative Gauge Precision
Maximum error at any negative pressure value is equal to maximum error at the equivalent positive pressure value.

Measurement Stability
- 0.01% of reading per year, from 10 to 3000 psi (700 mbar to 210 bar)
- 0.002% of reading per year below 10 psi (700 mbar)

Barometric Reference Precision
Precision for the optional barometric reference 0.002 psi (0.15 mbar). Includes non-linearity, hysteresis, repeatability and temperature effects between 40°F and 125°F (5°C to 50°C). Long term stability 0.002 psi (0.15 mbar) per year.

Controller Stability
- Better than 0.001% of span for ranges between 10 psi and 1000 psi (700 mbar and 70 bar).
- For pressures above 1000 psi (70 bar) better than 0.0015% of span.
- For pressures below 10 psi (700 mbar) better than 0.003% of span.
- For 10 inH_2O (25 mbar) range better than 0.008% span. 0.004% span with low pressure filter kit, supplied with units of 30 psi (2 bar) and below.

Controller Response
Less than 10 seconds into a 3 cubic inch volume, up to 10% full scale steps within 20 ppm of setpoint.

Gas Consumption
All supply gas is delivered to the system. No gas is used in measure mode, or when the instrument is turned off.

**Precision assumes regular zeroing.*

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DPI 515 Specifications

Dual Range

A single unit may have a combination of any two pressure ranges regardless of the ratio between them.

Electrical

Communications
RS232 and IEEE-488.2 HS interfaces supplied as standard. SCPI protocol and DPI 500, DPI 510, DPI 520 and Ruska Series 7000 emulation

Control Inputs and Outputs
- 1 opto-isolated input for switch test or event trigger
- 2 relay outputs
- 24 VDC output to energize external devices via logic outputs

Power Supply
- 90 to 260 VAC, 50 to 60 Hz
- Power rating 60 VA

Environmental

Temperature
Operating: 40°F to 125°F (5°C to 50°C)
Calibrated: 73°F (23°C)
Storage: -5°F to 140°F (-20°C to 60°C)

Humidity
Compliant with Def. Stan. 66-31 8.6 Cat 3

Vibration
Compliant with Def. Stan. 66-31 8.6 Cat 3

Shock
Mechanical shock conforms to EN61010

Conformity
EN61010, EN61326-1, 97/23/EC CE marked

Physical

Weight
Approximately 20 lb (9 kg)

Dimensions
15.35 in x 2.5 in x 11.8 in (390 mm x 132 mm x 300 mm). 3 U high case

Installation
Retractable feet supplied for benchtop use, alternatively an optional rack mounting kit allows easy installation within a 19 in (483 mm) rack system

Pneumatic Connections
1/8 BSP female or 1/8 NPT female via adapter supplied on vent, supply and outlet connections (USA only)

Reference connection M5 female

Options

(A) Barometric Reference
10 to 17 psi (750 to 1150 mbar) absolute measurement range with resolution to 0.0001 psi (0.01 mbar). This enables the DPI 515 to switch between gauge and absolute operating modes, and to provide a barometric pressure reading on demand. Option (B1) or (B2) included.

(B1) Negative Calibration–Single Range
Calibration of a single gauge range to -13 psi (-1 bar) or the full scale value, whichever is less. Available on ranges up to 1000 psig (70 bar)

(B2) Negative Calibration–Dual Range
Calibration of both gauge ranges to -13 psi (-1 bar) or the full scale value, whichever is less. Available on ranges up to 1000 psig (70 bar)

(C) Aeronautical Units
Additional display units provided for airspeed, altitude and rate of climb: km/hr, mph, mach, ft, m, ft/min, m/min

(D) Rack Mounting Kit
Includes side and rear supporting brackets for 19 in (483 mm) rack systems

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DPI 515 Specifications

(E) Low Absolute Pressure–Enhanced Performance
Low pressure absolute control using resonant sensors for the following pressure ranges:

- 10 to 17 psia (750 to 1150 mbar)
- 0.5 to 20 psia (35 to 1310 mbar)
- 0.5 to 40 psia (35 to 2650 mbar)
- 0.5 to 50 psia (35 to 3500 mbar)

Precision 0.01% FS including non-linearity, hysteresis, repeatability and temperature effects over 50°F to 105°F (10°C to 40°C). Measuring stability 0.01% FS per year.

(G1) Filter Set–Single Range Instrument
Set of in-line filters for the pressure supply and outlet

(G2) Filter Set–Dual Range Instrument
Set of in-line filters, one for each pressure supply and outlet

(H) Sensor Calibration Module
Input card supplies 10 V regulated or 24 V unregulated sensor excitation. Reads in mV, mA or volt output from the pressure sensor under test. Please refer to the DPI 515 SCM datasheet for full specification and order details

(J) Venturi Vacuum Generator
Ideal for generation of low vacuum supply from positive pressure source, not suitable for bottle supplies. Generates -0.3 to 5.4 psi (-20 to -370 mbar) vacuum for 15 to 150 psi (1 to 7 bar) supply respectively.

Accessories

The DPI 515 is supplied with power lead and molded plug, user handbook and calibration certificate traceable to international standards, NIST and NPL. Units of 30 psi (2 bar) and below come with atmospheric filter kit.

Related Products

Laboratory and Workshop Instruments
GE manufactures a comprehensive range of pressure instruments. Included in this range are pressurements industrial deadweight testers and Ruska high precision controllers and primary standard piston gauges.

Portable Field Calibrators
GE manufactures a wide range of portable pressure, temperature and electrical field calibrators particularly suitable for use in remote outdoor conditions.

Calibration Management Software
GE Intecal-W is a Windows®-based package that supports laboratory and field based calibrations. Interfacing with many popular instruments such as the DPI 515, DPI 605, DPI 610 and MCX, Intecal-W offers a complete and quality assured solution to calibration management.

Pressure Transducers and Transmitters
GE manufactures an extensive range of pressure transducers and transmitters, including custom designed, rangeable and Smart/HART® process pressure transmitters.

Ordering Information

Please state the following (where applicable):
1 DPI 515
2 Single or dual range
3 Pressure range(s), gauge or absolute
4 Options required
5 User language

LabVIEW® Driver
Software driver for LabVIEW is available free of charge and can be downloaded at www.dpi515.com

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