DPI 515

DPI 515

Precision Pressure Controller/Calibrator

Druck

- Pressure ranges up to 210 bar
- Precision 0.01% full scale
- Control stability 0.001% of span
- User friendly, high speed control
- Unique, patented control system
- RS 232 and IEEE 488 communications

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Since the early 1980's, Druck has led the world in pressure controller technology and function. 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 Druck's previous best selling pressures controllers.

INNOVATION

The latest measuring and control technology is incorporated in one compact, functional instrument. Multiple processors, advanced software and a large area display are amongst a host of features that make the DPI 515 the most flexible controller in the market, 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 inch rack installation using the optional rack mounting kit.

MEASURING

Druck'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% full scale 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 1ppm) measurement is achieved with high performance, self-calibrating electronics and a full 7-digit display.

CONTROL

The DPI 515 patented* 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 unmeasurable 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 pressurised system, indicating leaks on the unique 'Activity Indicator'.

** Patent Numbers: EP0710905A1, US315540-101 & UK2295249*

QUALITY

Druck is ISO 9001 approved, with all instruments manufactured to strict quality control procedures and calibrated against traceable reference standards. Full NAMAS certification is also available.

7 digit display

Keypad for local control

Rotary control for fine adjustment

Quick selector function keys

Retractable feet for benchtop use

Intuitive, multilingual menu-style software

Compact and rugged case

Location points for rack mounting kit

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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

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

INSTALLATION

The DPI 515 is designed for 19 inch 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.

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 facility, a second pressure sensor and control manifold is fitted. Uniquely, both ranges are fully independent, providing control stability based on each individual full-scale 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 fitted, 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 utilising the Barometric reference for absolute pressure 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
To automatically measure 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 15 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.

Multiple controller system
If multiple pressure ranges are required for the same process, the new Druck InstrumentBus enables up to six DPI 515 precision pressure controllers to be connected together, forming a single multi-range pressure control system up to 70 bar. A user designated "master" instrument will operate all the other "slave" controllers, auto-ranging between each pressure range. This simply requires the operator to drive an integrated system from a single display, providing as many as 12 pressure ranges or even 24 ranges using the barometric reference.

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

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 keypress. 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, whilst 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, satisfying quality assurance requirements.

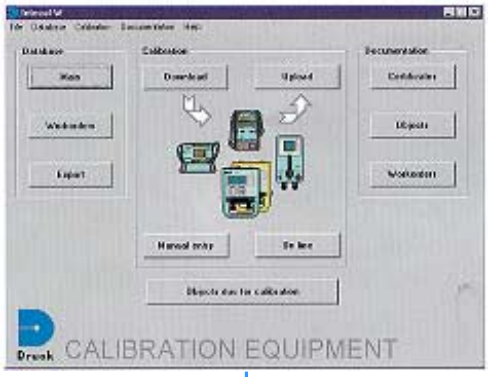
Operating limits
The controlled pressure range can be restricted to protect the device under test from either over or under pressure. Alternatively, alarm limits can be set to provide an audible warning.

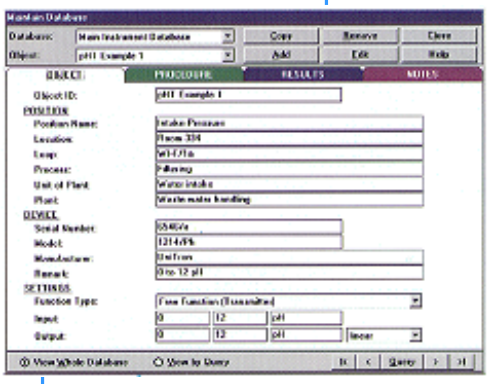
CALIBRATION MANAGEMENT

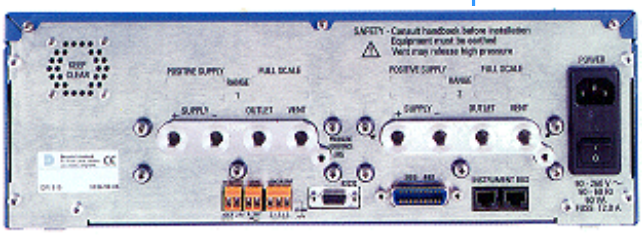
COMMUNICATION
RS 232 and IEEE-488 are fitted as standard in the DPI 515, allowing easy remote control and configuration for integrated computer driven systems. The popular SCPI protocol (Standard Commands for Programmable Instruments) is used to provide standardisation with other instruments. In addition, DPI 510, DPI 520 and Ruska 7000 series emulation is available, also LabVIEW® and TESTPOINT®drivers.

SOFTWARE
Druck Intecal-W 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 Druck 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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Standard Specification

PRESSURE MEASUREMENT

Standard pressure ranges
70 and 200, 350, 700 mbar, 1, 2, 3.5, 7, 10, 20, 35, 70, 100, 135 and 210 bar gauge.
All versions available with negative gauge calibration as an option.
For absolute pressure ranges specify option A, Barometric Reference.
Absolute pressure ranges as above, plus atmospheric pressure.

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

Pressure media
Dry, oil free, non-corrosive gas maintained at a value of 10% above the full scale pressure range. 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.
bar, mbar, Pa, hPa, kPa, MPa, kgf/cm^2, kgf/m^2, mmHg, cmHg, mHg, inHg, mmH_20, cmH_20, mH_20, inH_20^{20}, inH_20^{04}, inH_20^{60}, ftH_20^{20}, ftH_20^{04}, psi, lb/ft^2, torr, atm, special.

Language
English, French, German, Italian, Portuguese and Spanish.

PERFORMANCE

Precision
Precision 0.01% full scale from 700 mbar to 210 bar.*
Precision 0.03% full scale below 700 mbar.*

Precision includes non-linearity, hysteresis, repeatability and temperature effect between 18°C and 28°C, for both absolute and gauge pressures.
Plus 0.004% full scale for 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
0.03% of reading per annum.

Barometric reference precision
Precision for the optional barometric reference 0.15 mbar.
Includes non-linearity, hysteresis, repeatability and temperature effects between 5°C and 50°C. Long term stability 0.15 mbar per annum.

Controller stability
Better than 0.001% of span for ranges between 0.5 bar and 70 bar.
For pressures above 70 bar better than 0.0015% of span.
For pressures below 0.5 bar better than 0.003% of span.

Controller response
Less than 10 seconds into a 50 cm^3 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.

***Note**: Precision assumes regular zeroing..*

DUAL RANGE

A single unit may have a combination of any two pressure ranges regardless of the ratio between them. Gauge and absolute ranges may be mixed and are fully independent of each other.

ELECTRICAL

Communications
RS 232 and IEEE-488.2 HS interfaces supplied as standard.
SCPI protocol and DPI 510, DPI 520 and Ruska 7000 series emulation.

Control inputs and outputs
1 opto-isolated logic input for switch test or event trigger.
2 relay outputs.
24 Volt dc output to engergise external devices via logic outputs.

Power supply
90 to 260 Vac, 50 to 60 Hz
Power rating 60 VA

ENVIRONMENTAL

Temperature
Operating 5°C to 50°C
Calibrated 23°C
Storage -20°C to 60°C

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

Vibration
Compliant with Def Stan. 66-31 8.4 cat 3.

Shock
Mechanical shock conforms to EN61010.

Conformity
EN61010, EN50081-1, EN50082-1, 97/23/EC CE marked.

PHYSICAL

Weight
Approximately 9kg.

Dimensions
390 mm (wide) x 132 mm (high) x 300 mm (depth). 3U high case.

Installation
Retractable feet supplied for benchtop use, alternatively an optional rack mounting kit allows easy installation within a 19 inch rack system.

Pneumatic connections
1/8 female (BSP) on Vent, Supply and Outlet connections.
Reference connections M5 female (gauge versions only).

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Options and Related Products

OPTIONS

(A) Barometric reference
750 to 1150 mbar absolute measurement range with resolution to 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 -1 bar or the full scale value, whichever is less. Available on ranges up to 70 bar g.

(B2) Negative calibration -dual range
Calibration of both gauge ranges to -1 bar or the full scale value, whichever is less. Available on ranges up to 70 bar g.

(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 inch rack systems.

(E) Low absolute pressure - enhanced performance
An enhanced measurement stability for the following pressure ranges:

750 - 1150 mbar a
35 - 1310 mbar a
35 - 2620 mbar a
35 - 3500 mbar a

Precision 0.01% F.S. including non-linearity, hysteresis, repeatability and temperature effects over 10°C to 40°C. Measuring stability 0.01% F.S. per annum.
Please quote option (E1) for single enhanced range and option (E2) for dual enhanced range instruments.

(F1) LabVIEW® driver
Software driver for LabVIEW®

(F2) TESTPOINT®driver
Software driver for TESTPOINT®

(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 of each pressure supply and outlet.

ACCESSORIES

The DPI 515 is supplied complete with power lead and moulded plug, InstrumentBus lead, user handbook and calibration certificate traceable to international standards.

CALIBRATION STANDARDS

Instruments manufactured by Druck are calibrated against precision calibration equipment traceable to international standards.

Continuing development sometimes necessitates specification changes without notice.

RELATED PRODUCTS

Laboratory and workshop instruments
Druck manufacture 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. A selection is shown below:

Portable field calibrators
Druck manufacture a wide range of portable pressure, temperature and electrical field calibrators particularly suitable for use in remote outdoor conditions. A selection is shown above.

Calibration management software
Druck Intecal-W is a Windows® based package which 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
Druck manufacture 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 handbook language.

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