DPI 610/615 Series

Portable Pressure Calibrators

Druck

- Ranges 0 to 2.5 mbar through to 700 bar

- Accuracy 0.025% FS all ranges

- Integral combined pressure/vacuum pump

- Dual readout

- 4 to 20 mA loop test facility

- RS 232 interface and fully documenting version

- Intrinsically safe version

D P I   610/615 S e r i e s

Portable Pressure Calibrators

SETTING THE STANDARD FOR PORTABLE PRESSURE CALIBRATORS

The technically advanced Druck DPI 610 and DPI 615 portable calibrators are the culmination of many years of field experience with the company's DPI 600 series.

These self-contained, battery powered packages contain a pressure generator, fine pressure control, device energising (not IS version) and output measurement capabilities, as well as facilities for 4 to 20 mA loop testing and data storage. The rugged weatherproof design is styled such that the pressure pump can be operated and test leads connected without compromising the visibility of the large dual parameter display. The mA step and ramp outputs and a built-in continuity tester extend the capabilities to include the commissioning and maintenance of control loops.

Intrinsically Safe versions are available as complete maintenance tools and portable calibration standards for pressure instruments and control loops in hazardous 'Zoned' areas. Certified to BASEEFA and CENELEC standards, the DPI 610IS and DPI 615IS can reduce response times to breakdowns and emergencies by removing the need for 'Hot Permits' and gas detection equipment. This gives peace of mind to all those responsible for safety within hazardous areas.

A highly accurate and easy to use calibrator is only part of the solution for improving overall data quality and working efficiency. The DPI 610 and DPI 615, with data storage and RS 232 interface, reduce calibration times and eliminate data recording errors. The DPI 615 also provides error analysis for field reporting of calibration errors and pass/fail status. In addition, procedures downloaded from a PC automatically configure the DPI 615 to pre-defined calibration and test routines.

Improved performance

The DPI 610/615 series combine practical design with state of the art performance, summarised as follows:

Accuracy:	0.025% FS for ranges 70mbar to 700mbar
Ranges:	2.5 mbar to 700 bar including gauge, absolute and differential versions
Integral pneumatic pressure source:	–850 mbar to 20 bar
Integral hydraulic pressure source:	0 to 400 bar
Measure:	Pressure, mA, V, switch state (open/closed) and ambient temperature
Output:	Pressure, mA step, mA ramp, mA value
Energising supplies:	10 and 24 Vdc (not IS version)
Data storage:	10,000 values
Documenting (DPI 615 only):	Error analysis with pass/fail status and graphs. Two way PC communication for transferring procedures and results.
Remote pressure sensors:	Up to 10 digitally characterised sensors per calibrator.

Simplified operation

Druck's knowledge of customer needs, combined with innovative design, results in high performance, multi-functional calibrators which are simple to use. The key to simple operation is the Task Menu. Specific operating modes such as P-I, switch test and leak test are configured at the touch of a button by menu selection.

Featuring highly reliable pneumatic and hydraulic assemblies and self-test routines, the DPI 610/615 series can be relied upon time and time again for field calibration in the most extreme conditions.

Druck

Intrinsically Safe Version supplied in a yellow case

Set up key to determine default working parameters

Automatic zero correction for any input or output parameter

Input/output parameter selection keys with dedicated task key for instant access to the task menu

Documenting keys to store and recall screen 'snapshots', multi-channel data log, calibration procedures and results

Unique integral handle with compliant finger grip

Pressure input/output test point

Volume adjuster for fine pressure control

Combined pressure/vacuum pump with -850 mbar to 20 bar capability

Multi-lingual firmware supported by Linkpak-W and Intecal-W calibration software

RS 232 and remote sensor connectors

Input and output connectors

Sealed tactile elastomeric keypad

Function keys used in response to display prompts

Range label for quick identification

Release valve allows controlled pressure venting

Rotating selector converts the pump to pressure or vacuum

Multi-purpose strap for carrying or hanging the calibrator

SET UP
ZERO
INPUT
TASK
OUTPUT
STORE
RECALL
I/O
F1
EXIT
F2

Druck **DPI 615** Pressure Calibrator

TASK: P-I
LOG FILE: NONE   24U ON

20·036
mA

0.23 %Span PASS

2·0000
bar

TURN OFF
CAL MODE

max 50V
CAT II

V in

mA in   55 mA max

mA Sink

24V out   mA out   Xmtr   10V out

20 bar g

D P I 610/615 S e r i e s

Applications

DPI 610/615 PORTABLE PRESSURE CALIBRATORS

The DPI 610 and DPI 615 have been designed for ease of use whilst meeting a wide range of application needs including calibration, maintenance and commissioning. The Intrinsically Safe versions are certified to European and North American standards for use in hazardous areas.

The dual parameter display shows the **INPUT** and **OUTPUT** values in large clear digits. A unique integral handle provides a secure grip for on-site use in addition to a shoulder strap which is also designed to allow the instrument to be suspended for hands-free operation.

Any technician can use these calibrators without formal training, such as a novice on an emergency call out, or those familiar with the DPI 601. By selecting basic mode the calibrator is configured to source pressure and measure mA or V, with all non-essential keys disabled.

Dedicated task menu

The dedicated **TASK** key gives direct access to the **TASK** menu. Select the required test, for example P-I for a pressure transmitter, and with a single key press, the calibrator is ready.

Use the **ADVANCED** mode for custom tasks and add to the **USER TASK** menu for future use.

Some of the capabilities

	P	mA	V	10V*	24V*	Switch	°C
Measure	✔	✔	✔			✔	✔
Source	✔	✔		✔	✔		

P = Pressure   °C = Local ambient temperature   * = Not IS

PRESSURE TRANSMITTER CALIBRATION
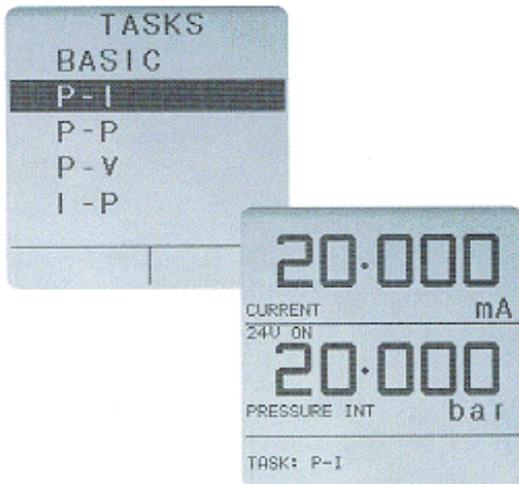
The **P-I** task configures the DPI 610/615 to simultaneously display the **OUTPUT** pressure and the **INPUT** current. The pressure unit can be chosen to suit the transmitter and a 24V supply is available for loop power. (not IS version)

For process transmitters reading in percentage use **%SPAN** to scale the pressure accordingly.

The DPI 610/615 Pneumatic Calibrator hand-pump can generate pressure from -850 mbar to 20 bar. The volume adjuster gives fine pressure setting and the release valve also allows gradual venting for falling calibration points.

Reduce the burden imposed by quality systems such as ISO 9000, simply **STORE** results in memory and leave both pen and calibration sheet back at the office.

PRESSURE SWITCH TESTING AND LEAK TESTING
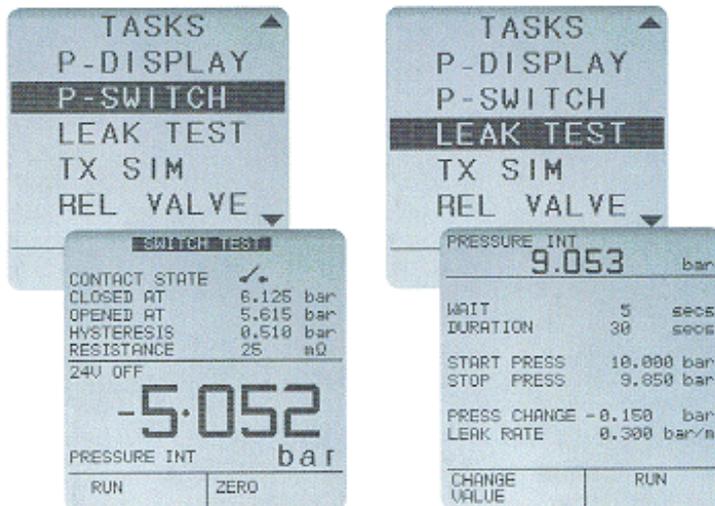
For Switch Set-up and Fault Finding, the display shows the output pressure and switch state **OPEN** or **CLOSED**. Continuity is declared by an audible signal.

Verify pressure switch performance using the automatic procedure. The DPI 610/615 displays the switch points and the contact hysteresis.

LEAK TEST will check for pressure leaks prior to calibration or during routine maintenance. Define the test times or use the defaults and wait … The DPI 610/615 will report the **START** and **STOP** pressures, the pressure **CHANGE** and the **LEAK RATE**.

Take a **'SNAPSHOT'** of the working display, all details are stored in a numbered location for later **RECALL**.

LOOP TESTING AND FAULT FINDING

The DPI 610/615 can generate a continuous **mA STEP** or **mA RAMP** output, allowing a single technician to commission control loops.

Feed the loop using **mA STEP** or **mA RAMP** and at the control room, check the instrumentation.

Use **mA VALUE** for alarm and trip circuit tests. Any mA output can be set and adjusted from the keypad.

Comprehensive process features aid flow and level measurement and help with trouble shooting. Select **TARE, MAX/MIN, FILTER, FLOW** or **%SPAN** and the function will be applied to the input parameter.

Save time fault finding, by leaving the DPI 610/615 to monitor system parameters. Use periodic **DATA LOG** or the **MAX/MIN** process function to capture intermittent events.
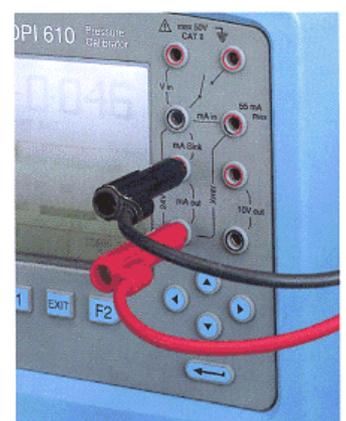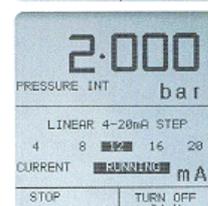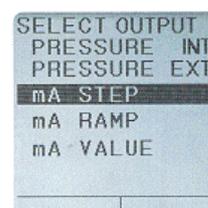
REMOTE PRESSURE SENSORS

By adding up to 10 external sensors (one at a time) the working ranges of the DPI 610 and DPI 615 can be extended. With modules from 2.5 mbar to 700 bar sensors are available to suit most applications.

As a leading manufacturer of pressure sensors Druck has applied the latest silicon technology and digital compensation techniques to develop these sensors.

Remote sensors offer a costs-effective means of expanding the capabilities of the DPI 610 and DPI 615, for example in the following applications:

- Low Pressure
- Pressure to pressure
- Differential pressure
- Wide range, high accuracy
- Test point monitoring
- To prevent cross contamination
- To configure pneumatic calibrators for high pressure hydraulic systems
- To configure hydraulic calibrators for low pressure pneumatic systems

DPI 615 PORTABLE DOCUMENTING PRESSURE CALIBRATOR

The DPI 615 adds powerful time saving and error eliminating features to the comprehensive functionality of the DPI 610. These include field error calculations with PASS/FAIL analysis and two way PC communications for downloading procedures and uploading results.

Reporting errors in the field
The DPI 615 calculates errors and reports the PASS/FAIL status during field tests. Problems and failures can be analysed graphically for immediate assessment and correction. This simple to use feature reduces calibration and maintenance times and eliminates human errors.
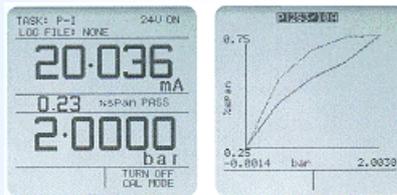

Completing the paper trail
It takes longer to fill out a calibration report, calculate the errors and assess the results than it does to calibrate the transmitter. With the DPI 615, documents can be quickly completed either on site or, at a more convenient time and location, by recalling the information from the DPI 615's memory.

Calibration management systems
When used in conjunction with calibration management software the DPI 615 greatly reduces the financial and resource burden imposed by quality systems such as ISO 9000. As work orders are issued, object lists and procedures are downloaded to the DPI 615. In the field these procedures configure the instrument for the tests. The errors and PASS/FAIL status are reported and recorded in memory (as found or as left results) for later upload to the software. Calibration certificates can then be printed and plant maintenance systems updated. The whole documenting process is completed in a fraction of the time it takes using manual systems and without human error.

For more information on calibration software please refer to the Linkpak-W and Intecal-W data sheets or visit www.druck.com for free demonstration software. The DPI 615 is also compatible with many third party software systems.
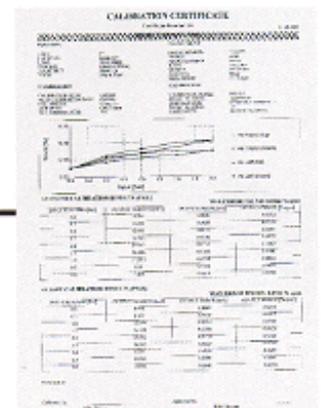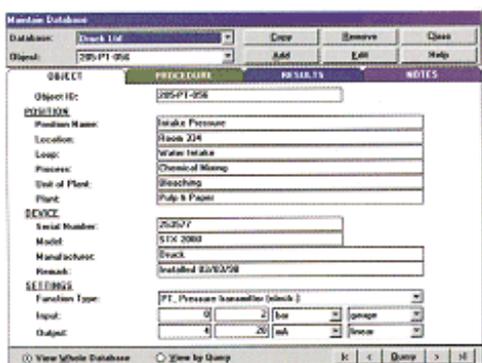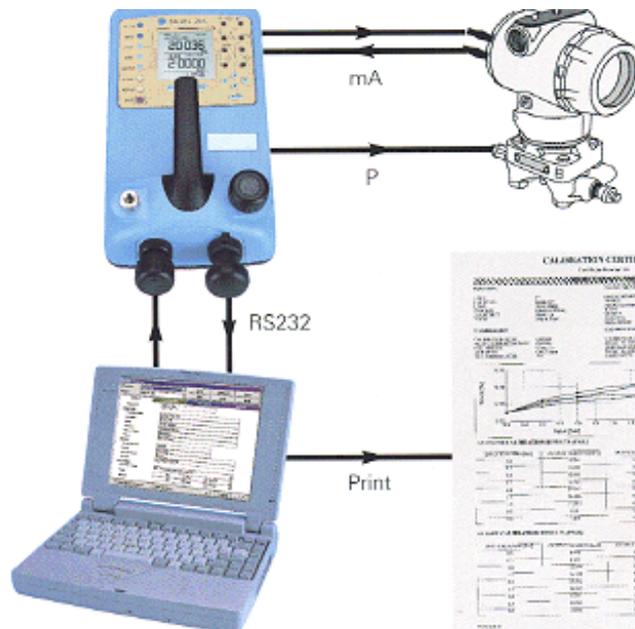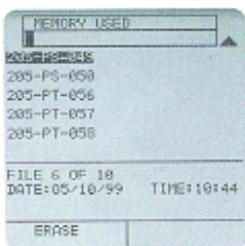
DPI 610/615 Series

Standard Specification

PNEUMATIC CALIBRATOR DPI 610/615PC

Hand-pump
-850 mbar to 20 bar capability
Volume adjuster
Fine pressure adjustment
Release valve
Vent and controlled release
Pressure port
$G^1/_8$ (female)
Media
Most common gases

HYDRAULIC CALIBRATOR DPI 610/615HC

Priming pump
M5 (female) feed port
Shut-off valve
Open for system priming
Screw press
0 to 400 bar capability
Pressure port
$G^1/_8$ (female)
Media
Demineralised water and most hydraulic oils

INDICATOR DPI 610/615I

Release valve
Vent and controlled release
Pressure port
$G^1/_8$ (female)
Media
Most common fluids compatible with stainless steel

ELECTRICAL INPUTS

Input	Range	Accuracy	Resolution	Remarks
Voltage*	±50Vd.c. (±30Vd.c IS version)	±0.05%Rdg. ±0.004%F.S.	100nV max	Autoranging, >10MW
Current*	±55mA	±0.05%Rdg. ±0.004%F.S.	0.001mA	10W, 50V max. (30V max IS version)
Temperature Switch	-10° to 40°C	±1°C	1°C	Local ambient 5mA whetting (1mA IS version)

* Temperature coefficient ±0.0075% reading/°C w.r.t. 20°C

For IS version Ui = 30V max Ii = 100mA Pi = 1W max

ELECTRICAL INPUTS

Output	Range	Accuracy	Resolution	Remarks
Voltage (not IS version)	10Vd.c. 24Vd.c.	±0.1% ±5%		Max. load 10mA Max. load 26mA
Current*	0 to 20mA	±0.05%Rdg. ±0.01%F.S.	0.001mA	

*Temperature coefficient ±0.0075% reading/°C w.r.t. 20°C.

For IS version Ui = 30V max Ii = 100mA Pi = 1W max Uo = 7.9V max

SPECIAL FEATURES

Pressure units
25 scale units plus one user defined.

mA step
Continuous cycle at 10 sec intervals.

Function	MA Output						
4 to 20mA linear	4	8	12	16	20		
0 to 20mA linear	0	5	10	15	20		
4 to 20mA flow	4	5	8	13	20		
0 to 20mA flow	0	1.25	5	11.25	20		
4 to 20mA valve	3.8	4	4.2	12	19	20	12

mA ramp
Continuous cycle with configurable end values and 60 sec travel time.

Data log
Multi-parameter with internal memory for 10,000 values. Variable sample period for data logging or log on key press for calibration results.

Snapshot
Paperless notepad. Stores up to 20 complete displays.

RS232 Computer interface (IS version - safe area use only)
DPI 610 Unidirectional for uploading results to a PC.
DPI 615 Bidirectional for downloading procedures and uploading results.

Process functions
Tare, max/min, filter, flow, % span.

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

Power management
Auto power OFF, auto backlight OFF, battery low indicator and status on key press.

DISPLAY

Panel
60 x 60 mm graphic LCD with backlight. (backlight not available on IS version)

Readout
± 99999 capability, 2 readings per second.

ENVIRONMENTAL

Temperature
Operating: -10° to 50°C
Calibrated: -10° to 40°C

Humidity
0 to 90%, non-condensing.

Sealing
IP54.

Conformity
EN61010, EN50081-1, EN50082-1, CE marked.

Intrinsically Safe version: supplied certified for use in hazardous areas
EEx ia IIC T4 certificate Ex99E2002X
To EN50020: 1994 and EN50014: 1992
Ex ia IIC T4 certificate pending
To CAN/CSA - E79-11-95 and CAN/CSA E79 - 0 - 95
(Division 1, class 1, groups A, B, C and D)

Physical
3 kg, 300 x 170 x 140 mm.

Power supply
6 x 1.5 V C cells, alkaline (upto 65 hrs nominal use at 20°C for the standard version and 30 hrs for the IS version). For rechargeable batteries see Option A (20 hrs nominal use).

PRESSURE RANGES

The DPI 610/615 PC, HC and I include an integral sensor, the range of which should be specified from the list below. Up to 10 remote sensors (option B1) may also be ordered per calibrator.

Pressure Range	Pneumatic DPI 610PC/ DPI 615PC	Hydraulic DPI 610HC/ DPI 615HC	Indicator DPI 610I/ DPI 615I	Remote Option (B1)	Accuracy %F.S.
2.5mbar (-2.5)				VLD	*
10mbar (-10)				LD	*
25mbar (-25)				LD	*
50mbar (-50)				LD	*
70mbar (-70)				G or D	0.025
100mbar (-100)				LD	*
70mbar (-70)	G		G	G or D	0.025
200mbar (-200)	G		G	G or D	0.025
350mbar (-350)	G or A		G or A	G, A or D	0.025
700mbar (-700)	G or A		G or A	G, A or D	0.025
1 bar (-1)	G or A		G or A	G, A or D	0.025
2 bar (-1)	G or A		G or A	G, A or D	0.025
3.5 bar (-1)	G or A		G or A	G, A or D	0.025
7 bar (-1)	G or A		G or A	G, A or D	0.025
10 bar (-1)	G or A		G or A	G, A or D	0.025
20 bar (-1)	G or A①		G or A	G, A or D	0.025
35 bar (-1)				G, A or D	0.025
70 bar (-1)		G or A	G or A	G or A	0.025
135 bar		SG or A	SG or A	SG or A	0.025
160 bar		SG or A			0.025
200 bar			SG or A	SG or A	0.025
350 bar			SG or A③	SG or A	0.025
400 bar		SG or A②			0.025
700 bar				SG or A	0.025

Values in ( ) = negative calibration for G and D ranges.
A = absolute. D, LD and VLD = differential. G = Gauge. SG = sealed gauge.
For ①, ② and ③ please refer to overpressure.

Accuracy is defined as non-linearity, hysteresis and repeatability. (*=refer to Druck)
Temperature Effects (averaged and w.r.t. 20°C): ±0.004%rdg/°C.

Line pressure: D=35 bar

Line pressure span shift: D=0.5%/35 bar

Remote sensor media compatibility: A, G, D (positive port) and SG stainless steel and hastelloy. D (negative port) stainless steel and silicon.

Overpressure: Safe to 2 x F.S except ① 35 bar, ② 600 bar and ③ 350 bar maximum (refer to table).

DPI 610/615 Series

Options and related products

Druck

OPTIONS

(A) Rechargeable batteries and charger (not available for IS version)
A rechargeable Ni-cad battery pack to replace the standard dry cells. Supplied with a universal input charger/battery eliminator which allows the instrument to be used whilst charging.

(B1) Remote pressure sensor
The calibrators have a second pressure channel which can be configured with up to 10 remote sensors (one at a time). For ease of use the sensors are fitted with an integral electrical connector and G1/4 (female) pressure ports.
Please refer to specifications for ranges and associated accuracy.
A mating cable is required - see Option (B2).

(B2) Mating cable for remote sensors
A 2 metre mating cable for connecting remote sensors to the calibrator.
At least one cable should be ordered when ordering Option (B1).

(C) $^1/_8$ NPT (female) adaptor
A stainless steel adaptor and bonded seal to convert the standard G$^1/_8$ (female) pressure port to $^1/_8$ NPT (female).

(D1) Linkpak-W calibration software (P/N LPDPI)
Developed to help meet the growing demand on industry to comply with quality systems and calibration documentation. Test procedures are created in a Windows based application and devices due for calibration are reported and grouped into work orders for transfer to the DPI 605, DPI 615, TRX-II or the MCX. Calibration results, including files from the DPI 610, are uploaded to the PC for analysis and to print calibration certificates. Visit www.druck.com for Linkpak-W demonstration
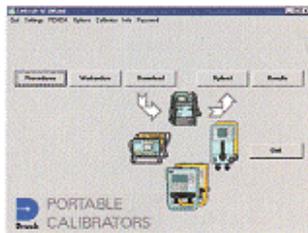
(D2) Intecal-W calibration database software (P/N ICDPI)
Intecal-W Windows based software builds on the basic concept of Linkpak-W supporting both portable field calibrators and on-line workshop calibrators. Manual data entry is also a key feature for recording data. Intecal-W is an easy to learn and easy to use calibration management software for process plants, workshops, contractors, manufacturers and service companies. It offers high productivity of calibration scheduling, calibration work and documentation. Device information, calibration procedures and calibration results are stored in an instrument database and multiple databases can be created for organising client accounts, processes or areas. Extensive management features are provided including a database search engine, time based calibration due queries and standard reports.
Visit www.druck.com for an Intecal-W demonstration
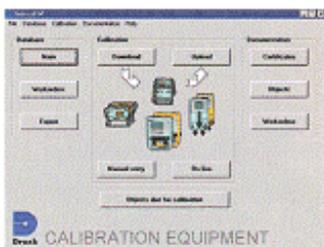
ACCESSORIES

The DPI 610/615 is supplied with carrying case, test leads, user guide and calibration certificate as standard. The DPI 610/615HC also has a 250 ml polypropylene fluid container and priming tube.

CALIBRATION STANDARDS

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

RELATED PRODUCTS

Portable field calibrators
Druck manufacture a wide range of portable pressure, temperature and electrical field calibrators. A selection of these are shown below.

Laboratory and workshop instruments
Druck also manufacture a comprehensive range of pressure indicators and controllers. Included in this range are the Pressurements industrial deadweight testers and the Ruska high precision controllers and primary standard piston gauges.

Pressure transducers and transmitters
The DPI 610 is the ideal calibration and maintenance tool for Druck transducers and transmitters, including the RTX and Smart/HART® STX process pressure transmitters. Please refer to manufacturer for further information on related products.

ORDERING INFORMATION

Please state the following (where applicable):-
1. Full DPI 610 or DPI 615 type number e.g. DPI 610PC.
   For IS version use the suffix 'S' after the basic model number eg DPI 610S PC
2. Integral pressure range gauge or absolute.
3. Options, including range for remote sensors.
   Note option (B1) and (D) should be ordered as separate line items.
4. Preferred language of user guide. (Refer to specifications for availability).

Continuing development sometimes necessitates specification changes without notice.

Druck

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