DPI 260 SERIES

Digital Pressure Indicators

• Excellent linearity and hysteresis ±0.04% F.S. for ranges up to 35 bar
• Integral or remote transducer/transmitter
• Self contained strain gauge indicator
• Field ranging/scaling by internal switches
• BCD, RS 232, analogue and 4-20mA outputs
• Alarm/trip facilities and peak reading
**INTRODUCTION**

The DPI 260/261 and 262 range of digital pressure instruments measure and indicate pressure in any specified scale units and provide accuracies of ±0.1% F.S. or ±0.04% F.S. A package combining the DPI 260 with Druck’s PDCR 810 transducer is available called the DPG 270. The DPI 265/266 and 267 digital pressure monitors provide additional features of alarm trips, peak hold etc.

The instruments utilise the proven Druck range of pressure transducers for the DPI 260 and 261 and the pressure transmitters for the DPI 262. The Druck sensors have excellent linearity and hysteresis and good long term stability. The transducers can either be fitted inside the instruments or remotely mounted. Transmitters are remotely mounted and can often be situated at the pressure source.

The pressure range covered by the instrument extends from 70mbar to 700 bar gauge, differential or absolute. These accurate instruments provide competitive alternatives to conventional analogue dial gauges and manometers but with the advantage of clear, unambiguous digital readout and the possible options of BCD and analogue outputs.

The digital readout and electronics utilise the DPI 260 series purpose-designed instrument for interfacing with the transducers or the transmitters. This is a 4 1/2 digit, LED display capable of providing ±19999 for the full-scale pressure readout giving a resolution of 0.005%. To provide a required readout of pressures, specific transducers or transmitters can be matched to the instrument by means of the front panel zero and span adjustments and internal switches.

The DPI 260 series electronics contain an extremely stable polarised supply, signal conditioning and amplifier system which does not degrade the transducer specification.

The DPG 270 is a package of standard Druck products (the PDCR 810 and DPI 260), providing 4 1/2 digit panel meter, with analogue output, complete with an external transducer and 2 metres of cable. Supplied complete, calibrated, ready for use on 240V and 50-400Hz supplies. Full-scale pressure ranges from 350mbar gauge (5 psi gauge) to 70 bar gauge (1000 psi gauge) are available scaled in any pressure units.

The DPI 261 can be specified with a ±0.04% F.S. linearity, hysteresis and repeatability tolerance. This is achieved by employing electronic linearisation enhancement techniques to further improve the excellent characteristics of the transducer. In addition the temperature compensation is improved providing a figure, for sensitivity, of better than ±0.005% of reading/°C.

The DPI 262 digital pressure indicator is specially configured for use with 4-20mA transmitter outputs. Any of the Druck series of PTX pressure transmitters can be used with the DPI 262, with the exception of the PTX 200 which is a 3 terminal device. The transmitters are always mounted external to the indicator and connected via a cable.

The user can confidently use the high level analogue output, BCD outputs or RS232 available for accurate recordings on other data collection equipment, knowing that the fundamental pressure data is to an extremely high order of accuracy.

The instrument case is a compact, rugged purpose moulded ABS shell designed to fit a standard DIN panel cut-out (92 x 45mm). The panel instruments are suitable for easy mounting and are secured by case side fixings from the front panel.

The DPI 265/266 and 267 have the same standard specifications as the DPI 260/261 and 262, but with additional facilities that include alarm levels, peak reading and RS232 output. The case size increases to the DIN standard (96 x 96mm).

**BASIC INSTRUMENT**

This self-contained, strain gauge indicator can be used in conjunction with other sensors for the display of parameters such as force, displacement, load, liquid levels and strain. The user can interface this instrument to his own sensor and calibrate as required. Please refer to the price list for related price.
DPI 260 SERIES: Specification

DPI 260 INDICATOR

The DPI 260 is a general purpose 4½ digit LED strain gauge bridge indicator capable of indicating 19999 maximum full-scale for a wide range of input millivolts. A second order linearisation control is included to improve transducer performance (DPI 261/266).

For applications requiring full-scale engineering units less than 19999, the overload indication (flashing zeros) can be made to occur at any pre-set value. The zero reading can be suppressed or elevated up ±19999. The coarse gain, zero and decimal point selection are all achieved by internal switches making the instrument easy to re-programme in the field.

The transducer excitation supply can be selected to either 5 or 10 volts by means of links and will supply 350 ohm bridges.

Standard Specification

Readout ±19999.

Display 7.5mm seven segment LED.

Display Overload Settable anywhere between 1999 and 19999 to give flashing 0000.

Resolution 0.005% F.S. maximum.

Response 333 msec to full-scale on digital and BCD output.

Zero and Sensitivity Control Front panel trim adjustments.

Temperature Performance

Over the range 10° to 30°C.

Sensitivity temperature coefficient <0.005% of reading/°C

Zero offset temperature coefficient <0.003% F.S./°C (ref. to 50mV input-5V common mode)

Zero suppression temperature coefficient <0.005% of reading/°C

Long Term Stability

Zero offset <0.02% F.S. per year

Sensitivity<0.02% F.S. per year

Position Effect Negligible.

Electrical Specification

Excitation Voltages

5 or 10 Volts into 350 ohm bridge minimum (DPI 260/265, 261/266). 17.5 to 30 volts (not selectable) at 20mA for transmitter (DPI 262/267).

Loop Voltage Drop
2V at 20mA (100 Ohm) – DPI 262/267

Input Signal Range
10 to 200mV nominal for 19999 maximum display (DPI 260/265, 261/266). 16mA nominal for 19999 maximum display (DPI 262/267).

Zero Suppression/Elevation
Capable of ±19999 by internal switch setting.

Linearisation
Square law ±1% maximum at 100mV input (DPI 261/266).

Power Supplies
110V or 240V, 50-400Hz at 3VA max. Link selectable.

See options for alternative supplies.

Analogue Output Options

This multi-function board is configured by a link and resistor choice to give either a buffered 0 to 10 V (max) output or 4-20mA output; with zero suppression/elevation also being available. This 4-20mA can be configured either as passive sink or to power the loop with 20 volts (±0.5V). Under any configuration the following applies;

Zero rationalisation <±0.3% F.S.

* Gain rationalisation <±0.1% F.S.

Bandwidth 500Hz

In-band noise <±0.02% F.S. pk-pk.

Zero offset temperature coefficient <±0.001% of reading/°C

* Gain temperature coefficient <±0.005% of reading/°C

Zero suppression temperature coefficient <±0.005% of reading/°C

* Gain errors do not apply to 0 to 2V output which is a unity gain buffer.

Environmental Specification

Temperature
Operating 0° to 50°C
Calibrated 10° to 30°C

Storage –20° to +70°C

Physical Specification

Weight
600 gms nominal (DPI 260 series).
900 gms nominal (DPI 265 series).

Dimensions
96 mm (wide) x 48 mm (high) x 175 mm (deep)

-DPI 260/261/262
96 mm (wide) x 96 mm (high) x 175 mm (deep)

-DPI 265/266/267

Remote Connections
Transducer or transmitter electrical connections available via connector on rear panel.

Please refer to the electrical connections section.

Analogue Output Options

This multi-function board is configured by a link and resistor choice to give either a buffered 0 to 10 V (max) output or 4-20mA output; with zero suppression/elevation also being available. This 4-20mA can be configured either as passive sink or to power the loop with 20 volts (±0.5V). Under any configuration the following applies;

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Temperature
Operating 0° to 50°C
Calibrated 10° to 30°C

Storage –20° to +70°C

Physical Specification

Weight
600 gms nominal (DPI 260 series).
900 gms nominal (DPI 265 series).

Dimensions
96 mm (wide) x 48 mm (high) x 175 mm (deep)

-DPI 260/261/262
96 mm (wide) x 96 mm (high) x 175 mm (deep)

-DPI 265/266/267

Remote Connections
Transducer or transmitter electrical connections available via connector on rear panel.

Please refer to the electrical connections section.
DPI 260: Specification

**Integral Transducer Specification**

**Operating Pressure Ranges**
Any full-scale range can be specified between the ranges listed below:
- 0-700 mbar to 0-60 bar differential
- Maximum line pressure 2 bar.
For higher line pressures refer to manufacturer.
- Barometric range version:
  - 800 to 1200 mbar absolute.

**Pressure Scale Units**
Typical units available:
- hPa, Pa, kPa, MPa, mbar, bar, kg/cm², kg/m²
- mmHg, cmHg, mHg, mmH₂O, cmH₂O, mH₂O,
- torr, atm, psi, lb/ft², inHg, inH₂O and ftH₂O.
Other scales available.

**Overpressure**
The rated pressure can be exceeded by the following multiples causing negligible calibration changes:
- 10 x for 70 to 175 mbar ranges
- 6 x for 175 to 350 mbar ranges
- 4 x 350 mbar to 60 bar ranges

**Positive Pressure Media**
Compatible with most common fluids.

**Reference Pressure Media**
Dry, non-corrosive, non-conducting gases.
For liquid pressure media on reference, refer to remote transducer selection.

**Transduction Principle**
Integrated silicon strain gauge bridge.

**Pressure Connections (Integral)**
- G1/4"NPT
- M8 x 1.5 Ermeto
- 1/8"NPT

**Remote Transducer Specification**

**Operating Pressure Ranges**
Any full-scale range can be specified between the ranges listed below:
- 0-700 mbar to 0-70 bar gauge
- 0-700 mbar to 0-35 bar wet/dry differential
- 0-350 mbar to 0-50 bar wet/differential
- 0-350 mbar to 0-60 bar absolute

**Pressure Scale Units**
Typical units available:
- hPa, Pa, kPa, MPa, mbar, bar, kg/cm², kg/m²
- mmHg, cmHg, mHg, mmH₂O, cmH₂O, mH₂O,
- torr, atm, psi, lb/ft², inHg, inH₂O and ftH₂O.
Other scales available.

**Transducer Selection**
Please note the following:
- Gauge: – PDCR 800/900 series
- Absolute: – PDCR 900/series
- Wet/dry differential: – PDCR 10/1L
- Wet/wet differential: – PDCR 120/2L
- Depth measurement: – PDCR 830/930

Please refer to the relevant transducer data sheets for other types and specification details.

**Overpressure**
Please refer to the relevant transducer data sheet.

**Pressure Media**
Compatible with most common fluids.

**Electrical Connections**
Connector supplied with remote transducer and 1 metre of cable.
- Pin 1 Supply positive
- Pin 2 Output positive
- Pin 3 Output negative
- Pin 4 Supply negative
- Pin 5 Screen
- Pin 6 Sense

**Longer lengths available on request.**

**Pressure Measurement Specification**

**Accuracy**
Integral/external transducers.
Combined non-linearity, hysteresis and repeatability:
- ±0.1% F.S. for 70 mbar to 60 bar
- ±0.15% F.S. for 60 to 700 bar
(with external transducer)
- ±0.6% F.S. available for ranges to 20 bar on request.
  Please refer to manufacturer.

**Pressure Measurement Specification**

**Accuracy**
Combined non-linearity, hysteresis and repeatability:
- ±0.1% F.S. for 70 mbar to 700 bar ranges.
- ±0.3% F.S. for 70 mbar to 700 bar ranges.

**Temperature Effects**
Integral Transducers
±0.05% total error band 0° to 50°C.
For remote transducers operating over wider temperature ranges refer to the relevant transducer data sheet for temperature effects.

**DPI 261**

**Specification identical to DPI 260 except:-**

**Accuracy**

- ±0.04% F.S. for 70 mbar to 35 bar
- ±0.1% F.S. for 35 to 60 bar
- ±0.1% F.S. for 60 to 700 bar
(with external transducer)

**Better accuracies are available on request.**

**Temperature Effects**
Thermal sensitivity effects
- ±0.005% of reading °C to 60 bar

**DPI 262**

**Remote Transmitter Specification**

**Operating Pressure Ranges**
Any full-scale range can be specified between the ranges listed below:
- 0-70 mbar to 0-135 bar gauge or sealed gauge
- 0-350 mbar to 0-700 bar sealed gauge or absolute
- 0-175 mbar to 0-35 bar wet/dry differential

**Pressure Scale Units**
Typical units available:
- hPa, Pa, kPa, MPa, mbar, bar, kg/cm², kg/m²
- mmHg, cmHg, mHg, mmH₂O, cmH₂O, mH₂O,
- torr, atm, psi, lb/ft², inHg, inH₂O and ftH₂O.
Other scales available.

**Transmitter Selection**
Please note the following:
- Gauge, sealed gauge or absolute
- Wet/dry differential: – PTC 500/600 series
- Wet/wet differential: – PTC 110/120WL
- Depth measurement: – PTC 110/D and PTC 161/D

Please refer to the relevant transmitter data sheets for other types and specification details.

**DPI 265/267**

The description of the above DPI 260/261 and DPI 262 instruments can also be read across to the enhanced options instruments the DPI 265/266 and DPI 267. For example, if the characteristics of the DPI 260 are required but the added facilities of alarm levels, peak hold or RS 232 are also needed then the unit to specify will be the DPI 265.

For further details of the special features of the DPI 265 series, e.g. RS 232, peak hold, alarms etc, see details overleaf.

**DPI 265/267**

**Digital Pressure Gauge**
Specification identical to DPI 260 except:-

**Standard Operating Pressure Ranges**

<table>
<thead>
<tr>
<th>BAR (Gauge)</th>
<th>PSI (Gauge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-350 mbar</td>
<td>5 psi</td>
</tr>
<tr>
<td>1 bar</td>
<td>15 psi</td>
</tr>
<tr>
<td>2 bar</td>
<td>30 psi</td>
</tr>
<tr>
<td>3.5 bar</td>
<td>50 psi</td>
</tr>
<tr>
<td>7 bar</td>
<td>100 psi</td>
</tr>
<tr>
<td>15 bar</td>
<td>225 psi</td>
</tr>
<tr>
<td>35 bar</td>
<td>500 psi</td>
</tr>
<tr>
<td>60 bar</td>
<td>900 psi</td>
</tr>
</tbody>
</table>

Any full-scale range can be specified between the ranges listed above, up to 70 bar.
Other pressure units can be specified, e.g. kPa, mH₂O etc.
Supplied as standard with 0 to 2 Volt analogue output and calibration.
PDCR 810 transducer and 2 metres of cable.
Please refer to separate PDCR 800 Series data sheet.
DPI 265 SERIES: Specification

**DPI 265/266 and 267**

The DPI 265/266 and 267 provide the additional enhanced features of alarm levels, peak reading and RS232 output. This range of instruments is housed in a larger 96 x 96 mm enclosure and the various settings and command instructions are via the panel membrane keyboard. All the specification details describing the DPI 260, 261 and 262 still apply since the instruments are effectively incorporated into the DPI 265, 266 and 267 respectively.

These extra features make it possible for extra applications to be undertaken such as safety monitoring, tank filling, maximum failure pressure recording and central reporting to computer systems.

**DPI 265/266/267 Enhanced Capabilities**

Instruments are supplied with all the following features:

- **Alarm/Trip Levels**
  Two independent trip levels are available. Each trip level can be set anywhere over the 0-100% F.S. value. Each trip level has in turn its own adjustable re-set or hysteresis value, settable anywhere over the 0-100% F.S. providing, if required, a latched output.

- **Peak Reading**
  As an alternative to displaying the current pressure value, the maximum and minimum pressure excursions experienced over a period of time can be displayed. A press key is provided which on the first press displays the highest pressure value experienced. Re-pressing this key changes the display to the lowest pressure value experienced. To cancel either the maximum or minimum current value, press the Δ key. Pressing the set-up key returns the display to current value monitoring. The peak value is that sampled over the digital update period of 333mS.

- **Hold Facility**
  To freeze the display, press the HOLD key. The displayed value will then remain unchanged by further updates. Re-pressing this key will cancel the HOLD function and normal updates will resume.

- **Print Key**
  With an RS232 compatible printer connected to the interface, depressing this key outputs a single displayed value reading. Use of this key, in conjunction with this 'set-up' facility, enables the Baud rate to be selected and, if required, carriage return/line feed/function.

- **RS232 Interface**
  In addition to providing a valuable pressure value transmission interface to a remote computer system, it is also possible to utilise this interface to remotely program the instrument. The RS232 interface can then be used to remotely set and read trip levels, read peak values and re-set trip levels, interrupts, lock-out or enable the keyboard, read key-press actions and provide usual device clear commands. Several instruments can be operated on the same interface connected in a 'Daisy Chain' or network fashion, each being independently addressable.

All the settings are carried out from the front panel membrane key-pad. Relay contacts are provided with 5A/220V capability.

**Print Key**

**Peak Reading**

**RS232 Interface**
DPI 260 SERIES: Digital Pressure Indicators

OPTIONS

(A) Buffered BCD Parallel Output.
Full parallel, buffered, TTL compatible output with data valid signal, 10 msec data invalid period during update (DV=0). Display or output hold available.

(B) Buffered BCD Multiplexed Output
Four wire multiplexed data bus with TTL level and tri-state control, four bits parallel to indicate value and sequential digit transmission, with the digit address provided by a further 4 bits. Synchronised to data clock or can be continuously decoded. Display hold also available.

(C) Buffered Analogue Output –2V related to 19999.
0 to ±2V relating to 0 to ±19999 display, set to ±0.3% F.S. zero rationalisation with 2mA drive capability.

(D) Buffered Analogue Output – scaled above 175mbar
0 to ±10V relative to any scale value set to ±0.3% F.S. zero rationalisation and ±0.1% gain rationalisation with 2mA drive capability.

(E) Current Output – passive sink.
4-20mA representing 0-100% F.S. positive pressure read-out when powered by externally energised supply (this option allows the instrument to emulate a pressure transmitter).

(F) Current Output with Loop Power.
4-20mA representing 0-100% F.S. positive pressure readout and providing energising loop voltage of 20 volts nominal. (Loop voltage + 15V with option (H).)

(G) External Power Supplies.
External 12V d.c. operation at 300mA max. If requesting the 12V d.c. option the instrument will not have any mains power facility.

(H) External Power Supplies.
External 24V d.c. operation at 300mA max. If requesting the 24V d.c. option, the instrument will not have any mains power facility.

ACCESSORIES

Power supply lead, mating options connector, five point calibration certificate and instruction manual supplied with instrument.

ORDERING INFORMATION

If required, the basic instrument can be ordered without transducer or calibration.
Please refer to price list.

Please state the following:-
(1) Type number.
(2) Pressure range and scaling factor.
(3) Gauge, differential or absolute.
(4) Integral or remote transducer.
   For remote transducer see relevant transducer data sheet for ordering information.
(5) Temperature range for remote transducer.
(6) Pressure connection.
(7) Pressure media.
(8) Power supplies.
(9) Options.

For non-standard requirements please specify in detail.

Continuing development sometimes necessitates specification changes without notice.

INSTALLATION DRAWINGS Dimensions: mm

Druck manufacture a comprehensive range of pressure indicators, controllers and calibrators.
Please refer to manufacturer for further information and data sheets.

Instruments manufactured by Druck Limited are calibrated against precision pressure calibration equipment which is traceable to International Standards.

DIGITAL INSTRUMENTS

GHIJKL

ACCESSORIES

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電話：0945-678901

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