Safe Area pressure gauge

Hazardous Area pressure gauge

DPI 104 Series

Druck digital test gauges

Features

- 0.05% full scale (FS) accuracy
- Pressure ranges to 1400 bar (20,000 psi)
- Eleven selectable pressure units
- Large, easy-to-read display with five-digit resolution
- % pressure indication and additional bar graph for quick visual reference
- Temperature compensated accuracy from -10°C to 50°C (14°F to 122°F)
- 0 to 5V analog output
- Pressure switch test
- Minimum/maximum, tare and alarm functions
- IDOS compatible and RS232 serial interface
- Hazardous Area (Intrinsically safe) version available
- Stainless steel or Inconel pressure cavity for aggressive media

Applications

- Process monitoring and control
- Test and calibration

The DPI104 Series of microprocessor-controlled digital pressure gauges combine precision and functionality in a compact, robust and simple-to-use package. The DPI104 Series uses advanced silicon sensor technology with several convenient design features, resulting in an accurate, versatile yet affordable digital test gauge. Supplied as a standalone process indicator or in a kit with the widely proven Druck hand pumps, the DPI104 Series provides a reliable and economic solution for a wide range of pressure sensing applications.

DPI 104 specifications

DPI 104 specifications

Accuracy

0.05% FS including non-linearity, hysteresis, repeatability and temperature effects from -10°C to 50°C (14°F to 122°F)

Resolution

Maximum five digits

Pressure ranges

Range			Resolution		Maximum working pressure	
bar	psi	type	mbar	psi	bar	psi
0-0.7	0-10**	G*	0.01	0.001	0.77	11.2
0-2	0-30	G* or A	0.1	0.001	2.2	32
0-7	0-100	G* or A	0.1	0.01	7.7	111.7
0-20	0-300	G* or A	1	0.01	22	319
0-70	0-1000	G* or A	1	0.1	77	1117
0-200	0-3000	SG	10	0.1	220	3190
0-350	0-5000	SG	10	0.1	385	5583
0-700	0-10,000	SG	10	1	770	11,165
0-1000	0-15,000	SG	100	1	1100	15,950
0-1400	0-20,000	SG	100	1	1540	22,330

*All gauge models will respond to negative pressures.

**0.15% FS for 700 mbar (10 psi) range.

Burst pressure

Burst pressure is 2x working pressure (exception, 1400 bar (20,000 psi); burst pressure 2000 bar (29,000 psi).

Selectable pressure units

kPa, MPa, kg/cm2, mbar, bar, psi, in Hg, in H2O, m H2O, mm H2O and mm Hg

Display

- Pressure reading: 5 digits with 12.7 mm (0.5 in) character height
- Full scale indicator: 2.5 digits with 6.35 mm (0.25 in) character height

Pressure bar graph

In addition to the numeric pressure indication, the DPI 104 LCD display contains a circular twenty segment bar graph to provide the user with a quick visual estimation of pressure from 0 to 100% full scale output. The bar graph increments represent 5% of the user-selectable range.

Display update

Two times per second

Minimum/maximum values

The minimum and maximum pressure values can be displayed on the DPI 104 Series. This function can be enabled/disabled, and reset by the user.

Switch test

The DPI 104 Series features a switch test function that will capture and display the open and closed values from an external pressure switch. Maximum switch impedance 200 Ω.

Voltage output

The DPI 104 Series can be programmed to provide a 0 to 5 V output signal that can be configured as directly proportional to the pressure shown in the display or set to a fixed value. The voltage output mode provides 0.1% FS accuracy from 50 mV to 5 V.

Alarm output

The alarm output consists of an open drain field effect transistor (maximum current 250 mA, maximum voltage 24 VDC).

Adjustable mounting positions

For added convenience, the DPI 104 housing will rotate 320° around the pressure fitting and the faceplate can be rotated in any orientation for optimum visibility.

Menu lock

To guard against unauthorized menu access, the DPI 104 features a menu and tare lock function.

RS232 interface

Serial communications are provided to allow transfer of data to a PC with the optional serial lead (P/N IA4090-2-V0). Using this link, all menu commands and display data are available via an ASCII command set.

Network capability

Up to 99 DPI 104 instruments can be connected together in a daisy chain-configured network.

Universal Pressure Module (UPM) capability

To enhance the accuracy and extend the pressure range, UPM modules can be connected to the DPI 104 (Safe Area versions only).

Battery

Supplied with a 9V alkaline battery (MN1604). Battery life is approximately six months when used daily for one hour per day.

For increased performance on Safe Area versions only, a 9V lithium battery (not supplied by Druck) is recommended.

Pressure port

- 1/4 NPT or BSP male for units to 700 bar (10,000 psi)
- 9/16 x 18 UNF male cone connection 1000 bar (15,000 psi) and 1400 bar (20,000 psi) units

Enclosure

- Case material: ABS/PC plastic sealed to Type 4/ IP65
- Wetted parts: All stainless steel (316) or Inconel welded pressure cavity for compatibility with aggressive media.

Hazardous Area Approvals

- ATEX, IECEx, UKEX, CCOE, ECASEx, XPL approved: Ex ia IIC T4 Ga (–10°C ≤ Ta ≤ +50°C)
- ETL approved (Canada & US): Class I, Zone 0, Ex ia / AEx ia IIC T4 Ga (–10°C ≤ Ta ≤ +50°C)
- EAC approved: 0Ex ia IIC T4 Ga X (–10°C … +50°C)

DPI104 General specifications	
Working pressure	105% FS (alarm active beyond this range)
Operating temperature	-10 to 50°C (14 to 122°F)
Storage temperature	-20 to 70°C (-4 to 158°F)
Humidity	0 to 95% RH non-condensing
Shock and vibration	MIL-PRF-28800F for Class II equipment
EMC	EN 61326-1, KC (for safe area gauge)
Pressure safety	Pressure equipment directive class SEP
Approval	CE, UKCA, EAC, RCM marked, WEEE, REACH
Size and weight diameter	95 mm (3.74 in) excluding pressure fittings Depth: 55 mm (2.17 in) 350 g (12.5 oz) approximate
RoHS	EU, UK, UAE & China Compliant
Resolution	5 digits 20 segment analogue dial

Pneumatic and hydraulic test kits

The DPI 104 is included as a standard component in these test and calibration kits:

Low pressure pneumatic test kit

PV210 pneumatic test pump supplied in transit case with adaptor kit, hose, PRV and DPI104 or DPI104S (up to 2 bar/ 30 psi). Set of seals supplied with BSP version.

Pneumatic test kit

PV211 pneumatic test pump supplied in transit case with adaptor kit, hose, PRV and DPI104 or DPI104S (up to 20 bar / 300 psi).

Hydraulic test kit

PV212 hydraulic pump supplied in transit case with adapter kit, hose, PRV and DPI104 or DPI104S (up to 1000 bar / 15,000 psi).

Pneumatic and hydraulic test kit

PV411 pneumatic and hydraulic hand pump supplied in transit case with adaptor kit, hose, seals and DPI104 or DPI104S (up to 700 bar / 10,000 psi). Set of seals supplied with BSP version.

Refer to the PV hand pump datasheets for further information.

Low pressure pneumatic test kit

Pneumatic test kit

Hydraulic test kit

Pneumatic and hydraulic test kit

Ordering information for DPI104 Digital test gauge

The DPI104 Series are supplied with a user guide and calibration certificate as standard.

Please state the following (where applicable)

Model (mandatory to select only one)
DPI104 Safe Area pressure gauge
DPI104-IS Hazardous Area pressure gauge

Pressure connection (mandatory to select only one)
-1 G1/4 Male (For bar ranges less than 700 bar)
-2 1/4 NPT Male (For psi ranges less than 10,000 psi)
-3 9/16 x 18 UNF (For bar ranges 1000 bar and above)
-4 9/16 x 18 UNF (For psi ranges 15,000 psi and above)

Pressure range and reference type (mandatory to select only one e.g. 04G for each configuration)

	Gauge (G)	Absolute (A)
700 mbar/10 psi/70 kPa	**-04G**	
2 bar/30 psi/200 kPa	**-07G**	**-07A**
7 bar/100 psi/700 kPa	**-10G**	**-10A**
20 bar/300 psi/2 MPa	**-13G**	**-13A**
70 bar/1000 psi/7 MPa	**-16G**	**-16A**
200 bar/3000 psi/20 MPa	**-18SG**	
350 bar/5000 psi/35 MPa	**-20SG**	
700 bar/10000 psi/70 MPa	**-22SG**	
1000 bar/ 15000 psi/100 MPa	**-23SG**	
1400 bar/ 20000 psi/140 MPa	**-24SG**	

DPI104-IS -1 -04G (Example model numbers)

Accessories

Please state any accessories required as separate items when placing an order.

The DPI 104 Safe and Hazardous area versions are compatible with the following accessories unless otherwise specified.

Part Number	Description
191-350	DPI 104 external power supply unit with lead (Safe Area only*)
IA4090-2-V0	PC serial lead for connection to PC (Note: P/N 191-350 is recommended with PC serial lead).
1S-04-0027	Mating plug for eight-pin socket for switch test, voltage output, external power and alarm function (customers wishing to make their own connections/leads)
182-190	9/16 x 18 UNF to 3/8 BSP adapter for connection to PV212
IA4101-1-V0	DPI 104 UPM power lead for use with UPM IDOS Sensor . Requires P/N 191-129.
191-129	Universal 12V external power supply for use with the UPM IDOS remote sensor (Safe Area only)

*Note-external power can be used in hazardous location with a certified zener barrier (not supplied by Druck).

UKAS calibration

We also offer UKAS accredited calibrations, please advise at the time of order placement if required.

Ordering information for Test Kits

Use these ordering tables to order your test kit with (Pump supplied in Transit case with relevant adaptor kit, hoses, PRV and DPI104).

Pump Model (mandatory to select one)
PV210 Pneumatic Hand Pump
PV211 Pneumatic Hand Pump
PV411A Hydraulic/Pneumatic Hand Pump

DPI104 Model Type (mandatory to select one)
104 DPI104 Safe Area Gauge
104S DPI104 Hazardous Area Gauge

Mode (mandatory to select one)
P Pneumatic (PV210, PV211)
HP Hydraulic/Pneumatic (PV411)

Fittings (mandatory to select one)
1 BSP
2 NPT

Pressure range and reference type (mandatory to select one)

Pressure range	Gauge	Absolute	Pump
700 mbar (10 psi)	**04G**		PV210
2 bar (30 psi)	**07G**	**07A**	PV210
7bar (100 psi)	**10G**	**10A**	PV211, PV411A
20 bar (300 psi)	**13G**	**13A**	PV211, PV411A
70 bar (1000 psi)	**16G**	**16A**	PV411A
200 bar (3000 psi)	**18S**		PV411A
350 bar (5000 psi)	**20S**		PV211, PV411A
700 bar (10,000 psi)	**22S**		PV411A

PV211 -104 -P -2 -13G

Typical model number: PV211-104-P-2-13G *(Pump Kit with NPT Fittings & DPI104)*

Pump Model (mandatory to select one)
PV212 Hydraulic hand pump

Pressure range
22 700 bar/10,000 psi
23 1,000 bar/15,000 psi

DPI104 Model Type (mandatory to select one)
104 Pump test kit
104S Pump test kit

Fittings (mandatory to select one)
B BSP
N NPT

Pressure range and reference type (mandatory to select one)

Pressure range	Gauge	Absolute
70 bar (1000 psi)	**16G**	**16A**
200 bar (3000 psi)	**18S**	
350 bar (5000 psi)	**20S**	
700 bar (10,000 psi)	**22S**	
1000 bar (15,000 psi)	**23S**	

PV212 -22 -104S -B -16A (Typical model number)

Typical model number: PV212-22-104S-B-16A *(Pump Kit with BSP Fittings & DP104-IS)*

Druck offers a portfolio of high accuracy, high performance test and calibration equipment in safe or hazardous area (IS) variants that are ideal for the calibration and adjustment of Druck's pressure sensors.

Delivering world class pressure measurement and calibration technology

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