

GE

Measurement & Control

# Industrial Test Tools Guide



Multifunctional

Electrical

Temperature

Pressure

Hand Pumps

Software

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## Portable Calibration & Test Tools

Correctly installing, maintaining and calibrating process instruments is vital to ensure industrial processes are optimised and fully meet all quality, safety and regulatory rules. In this fast changing industrial environment, companies need to keep improving their calibration and maintenance processes just like any other core business function. To do this, calibration tools need to be fit for the job today and tomorrow.

GE has over 40 years of experience in designing world class calibration and maintenance instruments under its Druck product range. The Druck range of calibration instruments cover pressure, electrical and temperature parameters and have been tried and trusted by instrumentation engineers for a generation.

Today, GE's calibration & test tool range are the workhorse instruments for the process industry. They are designed to be cost effective, rugged, hard wearing and simple to use, yet accuracy and functionality is never compromised. Whether the task is setting up a pressure transducer or conducting an electrical loop calibration, GE's calibration and test tools range deliver accuracy and fast performance at the right total cost of ownership. Maximise your calibration productivity and minimise costs.

### Key Customer Applications

- Testing, Commissioning & Calibrating Process Instrumentation
- Preventative Maintenance
- Electrical, Frequency, Pressure & Temperature Measurements
- Trouble Shooting
- Scheduled Calibration (e.g. Transmitters & Transducers)
- Verifying Gauges, Indicators & Recorders
- Switches Trips & Alarms
- Field Pressure Testing
- Positioners & Converters

### Key Range Features

- Easy-to-use with simple menu-driven operation and time saving features
- Common user interface across the DPI800 series saves training time
- High Accuracy
- Powerful functionality
- Light-weight
- Reliable, Robust & strong design
- Cost-Effective





## Why Choose the Druck Range from GE

**GE's been a world leader in calibration and process industry tools for over 40 years with its Druck range and in that time, we've learnt a thing or two about what instrumentation engineers really need in the field.**

- The Highest Accuracy

GE is one of the only calibration manufacturers to make their own pressure sensors at a purpose built facility in the UK. Our new cleanroom, completely upgraded in 2015, incorporates the latest technology for processing silicon and manufacturing MEMS sensors for pressure transducers. Producing our own silicon based pressure sensors in house means we're able to maintain total control over quality and performance and so deliver the highest accuracy instruments which customers require.

- A tool for every Process Industry Parameter

The Calibration and Test tools range covers pressure, electrical, temperature and frequency parameters in either single function or multi-function tools. All tools in the DPI800 series have a similar interface and user memory so training time is significantly reduced.

- Scalability and Flexibility

All DPI800 series tools are work with our Plug 'n Play IDOS pressure module so pressure measurement capability can be added quickly and simply later to any DPI800 series tool

- Rugged enough for the toughest workplace

The Druck range is built tough and able to withstand the challenges of working in a harsh environment. Able to stand up to the toughest knocks, they are designed to last and last.

- Cost Effective & Productive

Designed to be cost effective on day 1 and cost effective over their total life, GE's calibration and test tools offer excellent value for money as well as excellent productivity



## Product Matrix

Products:	UPS II	UPS III/IS	DPI 800	DPI 802	DPI 812	DPI 822	DPI 832	DPI 842	DPI 880	DPI 104/IS	DPI 705/IS	DPI 740
Accuracy	Test	Reference Standard	High	High	High	High	High	High	High	High	Test	High
<b>Features</b>												
Intrinsically Safe		O								O	O	
Datalogging			O	O	O	O	O	O	O			
RS 232			S	S	S	S	S	S	S	S		S
<b>Measure</b>												
mA	S	S		S	S	S	S	S	S			
mV						S	S		S			
V		S					S		S			
RTD's					S				S			
Thermocouples						S			S			
ohms					S				S			
Frequency & Pulses								S	S			
Switch Test		S		S	S	S	S	S	S			
Pressure			S	S	M	M	M	M	M	S	S	S
<b>Source</b>												
mA	S	S					S		S			
mV						S	S		S			
V							S		S			
RTD's					S				S			
Thermocouples						S			S			
ohms					S				S			
Frequency & Pulses								S	S			
Loop Power	S	S		S	S	S	S	S	S			

### Keys:

- O: Optional
- S: Standard
- M: Optional Module

### Reference Standard Accuracy:

Suitable for virtually all instrument tests & calibration

### High Accuracy:

Suitable for general instrument tests & calibration

### Test Accuracy:

Appropriate for general test & monitoring

# Multifunction Calibrator

## DPI 880 Multifunction Calibrator

### Key Features:

- Simultaneous 2 channel measure/sources mA, mV, ohms & frequency
- Simulates and reads 8 RTDs & 12 thermocouples
- Automatic switch test & pressure leak test with 24V loop power supply
- Optional Data logging
- Compact, simple to use & easy to carry
- 32 Plug 'N' Play IDOS Pressure Modules gives flexibility



The robust, ultra-compact and simple to use DPI 880 Multifunction calibrator is virtually a calibration lab in the palm of your hand. With the DPI 880 you can calibrate electrical, temperature, pressure and frequency. With the ability to have automatic switch and pressure leak test, whilst also allowing you to obtain high precision data and addresses any issue in as much time as it takes to press a button, saving you valuable operating time.



# Electrical Calibrators

## Accurate, Easy-to-use & Compact

GE Druck's range of portable, electrical calibrators simplifies everyday maintenance tasks. The range includes easy-to-use and rugged electrical loop calibrators that are used globally in the process industry. These tools are essential for testing, instrument maintenance and troubleshooting with easy to read displays and simple time-saving features

### UPS-II Loop Calibrator

#### Key Features:

- Sources & reads milliamps with 24v loop power supply
- 0.05% accuracy of range
- Auto-ramp cycling for endurance tests
- Fixed currents for calibration & valve stroking
- Auto-stepping for hands-free calibration



The UPS-II loop calibrator has a 0.05% accuracy of range and can measure or source mA, power and read 2 wire transmitters to perform calibrations. The 24v loop power supply is an essential feature when disconnecting devices from the loop for calibration or when the loop power is off during plant shut downs.

With unique features such as auto-ramp cycling for endurance tests as well as auto-stepping for hands-free calibration to help increase productivity. The test leads are installed in the devices to help avoid loss and save time. The UPS-II is only 3"x5", its compact size means it can easily fit into your pocket.



## UPS-III Loop Calibrator

### Key Features:

- Measure or source mA 0 to 24 mA
- 0.01% accuracy of reading
- HART® loop resistor
- Step, Span Check, Valve Check and Ramp
- 60 VDC measurement & Continuity
- Simple, easy-to-use, robust design



The easy-to-use UPS-III loop calibrator is both rugged and extremely compact, measuring only 3" x 5" and weighing just 275 grams (0.6lb), this high accuracy loop calibrator is an essential tool for loop calibration. The UPS-III loop calibrator comes with vital time-saving features such as step, span check, valve check and ramp. The 24v loop power supply is an essential feature when disconnecting devices from the loop for calibration or when the loop power is off during plant shut downs.

0 to 60 VDC can be measured for loop diagnostics and maintenance of voltage output instruments, this tool is ideally suited for demanding process setups and maintenance.





## UPS-III-IS Intrinsically Safe Loop Calibrator

### Key Features:

- ATEX/IEC intrinsically safe
- Measure or source 0 to 24 mA
- 0.015% accuracy of reading
- Dual mA & % readout, linear or flow
- Step, span check, valve check & ramp
- 50 VDC measurement & continuity
- HART® loop resistor



The UPS-III-IS loop calibrator is both rugged and extremely compact, measuring 3.5"x 5.5" and weighing just 460g (1lb). The intrinsically safe loop calibrator uses standard industry AA batteries and comes with a leather case with a carry strap. The instrument features a graphic display with menu-driven interface, which is easier to use than traditional knobs, switches, multi-function keys sequences. An internal loop supply is available in both measure and source modes, which is essential during plant shutdowns. With its easy to read display and time saving features, it is an essential tool for loop testing, process set-ups, instrument maintenance and valve set-up.



## DPI 832 Electrical Calibrator

### Key Features:

- Dual reading capability
- Measure or source mA, mV and V
- 24V loop power
- Large backlit display, menu driver interface
- HART® loop resistor
- Compact & Robust
- 32 Plug 'N' Play IDOS pressure modules gives flexibility



The DPI 802 is an ideal pressure measurement tool with electrical measurement capabilities as well as 24 V loop power. It has 25 pressure units and pressure ranges from 25 mbar to 700 bars (10 in H<sub>2</sub>O to 10,000 psi). It is available in single or dual range configurations (one or two sensors and one optional external IDOS sensor) with an accuracy of up to 0.01% FS. It's ideally suited to pressure test and monitoring applications where pressure measurement and loop calibration is required. A Druck DPI 802 pressure indicator and loop calibrator used in conjunction with a pressure source from the Druck range of hand pumps provides a simple and cost effective calibrator for gauges, indicators and recorders.

## DPI 842 Electrical Frequency Calibrator

### Key Features:

- Measure or source Hz, kHz, CPM, CPH and pulses
- Measure or source 0.01 Hz to 50 kHz
- CPM, CPH & totalizing counter
- HART® loop resistor
- Large backlit display, menu driven interface
- Sine, square & triangular waveforms mA measure, switch test & 24V loop power
- 32 Plug 'N' Play IDOS pressure modules give flexibility



The DPI 842 is highly cost effective and is the ideal instrument for process technicians and electronic engineers, providing a highly accurate calibration standard and versatile test tool. It measures Hz, kHz, CPM, CPH and pulses, with its dedicated features facilitates test and maintenance of electronic circuits and frequency instruments including frequency meters, batch counters, tachometers, motion pickups, integrators and flow meters.

# Temperature Calibrators

## Robust, Easy-to-use & Accurate

GE Druck's range of Portable Temperature Calibrators consists of sophisticated, easy-to-use and highly accurate test instruments. With GE Druck's long-standing reputation, you can be assured that our temperature calibrators will exceed your everyday calibration requirements.

### DPI 812 RTD Loop Calibrator

#### Key Features:

- Measure & simulates 8 RTDs, ohms with mA measure
- Auto detection of 2, 3, 4 wire RTDs
- 24 V loop power
- HART® loop resistor
- 32 Plug 'N' Play pressure modules gives flexibility



The DPI 812 RTD Loop Calibrator measures and simulates RTD (resistant temperature detectors) sensors and is the ideal tool for checking probes, indicators, recorders and controllers. The DPI 812 features detection of 2, 3, 4 wire RTD and quickly detects faulty sensors and wiring. The fully programmable automatic outputs allow single-handed testing of control loops, technicians can leave the DPI 812 at the end of the control loop to generate a pre-programmed step or ramp sequence and be able to go to the control room, whereas, with other equipment, two technicians would be required.



## DPI 822 Thermocouple Calibrator

### Key Features:

- Measure & source thermocouples
- Advanced cold junction compensation
- mA measure switch test
- 24 V loop power
- HART® loop resistor
- 32 Plug 'N' Play IDOS pressure module gives flexibility



The DPI 822 Thermocouple loop calibrator measures and simulates RTD (Resistant temperature detectors) sensors and is the ideal tool for checking probes, indicators, recorders & controllers. The DPI 822 Thermocouple loop calibrator can be switched into the loop mode when required by HART® digital communicator and avoids inconvenience of carrying a 250 ohm resistor. Advanced cold junction compensation virtually eliminates errors due to ambient temperature changes.

The DPI 822 is an ideal tool for temperature test and maintenance, switch verification and loop set up and diagnostics and with IDOS compatibility can become a fully featured pressure calibrator.





# Pressure Calibrators

## Robust, Easy-to-use & Accurate

GE provides a complete range of highly advanced, robust and simple to use, hand-held Pressure calibrators. Providing best in-class measurement performance with pressure ranges from 25 mbar to 700 bar (10 in H2O to 10,000 psi) in rugged, easy-to-use package.

Advanced features and technical innovations address more applications in less time and deliver results you can rely on from one year to the next, even in tough environmental conditions.

## DPI 800 Pressure Indicator

### Key Features:

- Ranges from 25 mbar to 700 bar (10 in H2O to 10,000 psi)
- Single or dual range configurations
- Accuracies up to 0.01% FS
- Measure, switch test & 24V loop power
- HART® loop resistor
- 32 Plug 'N' Play IDOS pressure module gives flexibility



The DPI 800 Pressure Indicator is an ideal pressure measurement tool, ideally suited to pressure test and monitoring applications, where simple pressure measurement is required (instrument calibration, repair, installation and maintenance). It has 25 pressure units with pressure ranges from 25 mbar to 700 bars (10 in H2O to 10,000 psi) and an accuracy up to 0.01% FS. You can have one or two internal sensors and one interchangeable external IDOS sensor. A GE Druck DPI 800 pressure indicator used in conjunction with a loop calibrator and a pressure source from the GE Druck range of hand pumps provides a simple and cost effective calibrator for gauges, indicators and recorders.

## DPI 802 Pressure Calibrator with Loop

### Key Features:

- Ranges from 25 mbar to 700 bar (10 in H<sub>2</sub>O to 10,000 psi)
- Simultaneous measurement of pressure and mA
- Accuracies up to 0.01% FS
- Convenient one-handed operation
- mA Measurement, switch test & 24V loop power
- HART® loop resistor
- 32 Plug 'N' Play IDOS pressure modules gives flexibility



The DPI 802 is an ideal pressure measurement tool with electrical measurement capabilities. With 24 V loop power, an essential feature when disconnecting transmitters from the loop for calibration or when the loop power is off during plant shut downs. It has 25 pressure units and pressure ranges from 25 mbar to 700 bars (10 in H<sub>2</sub>O to 10,000 psi). Depending on your needs, you can have one or two sensors and one external IDOS sensor, with an accuracy up to 0.01% FS. It's ideally suited to pressure test and monitoring applications where pressure measurement and loop calibration is required.

A Druck DPI 802 pressure calibrator with loop used in conjunction with a pressure source from the Druck range of hand pumps provides a simple and cost effective calibrator for gauges, indicators and recorders.



## IDOS Intelligent Digital Output Sensors

### Key Features:

- Ranges from 25 mbar to 700 bar (10 in H<sub>2</sub>O to 10,000 psi)
- Standard (0.05% FS) or Premium (0.01% FS) accuracy levels
- Fully interchangeable with all IDOS compatible Druck products
- No special tools, wires or connectors required



IDOS (Intelligent digital output sensors) are housed in tough functional cases, providing dependability along with plug and play connectivity. They provide a cost effective solution for expanding instrument ranges, adding pressure measurement capability and enabling you to address more applications. IDOS offers all-inclusive accuracy of 0.05% FS, with an optional 0.01% FS premier accuracy available.

With IUPM or IUPMP you have the ability to add pressure measurement capabilities to all GE IDOS compatible Druck products.

### Compatible Products:

- All DPI 800 Series
- PACE 1000 Series
- PACE 1001 Barometer
- DPI 611
- DPI 620



### Key Features:

- Ranges 0 to 70 mbar through to 700 bar (0 to 1 psi through to 10,000 psi)
- 0.1% full scale (FS) accuracy
- 14 selectable pressure units
- Rugged, lightweight handheld design
- Leak test, tare, max/min and filter
- Intrinsically safe version available
- Clear high, resolution LCD display integral desk stands and hangers



The DPI 705 Series consists of the DPI 705, DPI 705IS, DPI 705R and DPI 705SR. All pressure indicators are compact, robust and light weight, designed for single-handed operations. They provide many essential features that are required for routine maintenance and system trouble shooting with pressure ranges from 0-70 mbar through to 700 bar (0 to 1 psi through to 10,000 psi). Combine the DPI 705 Pressure Indicator with our pneumatic or hydraulic PV hand pumps to create a simple and low cost, yet highly accurate process pressure calibrator.

### DPI 705 (IS) Intrinsically Safe Option

The DPI 705 IS has all the same features as the DPI 705, however, has the additional benefit of being intrinsically safe.

### DPI 705R Pressure Indicators

Remote sensors versions of the Druck DPI705 series with integral cable connector – 1 meter (3 feet) mating cable ¼ in npt female or G ¼ female pressure connector.

### DPI 705SR Pressure Indicators

The DPI 705SR has the same features as DPI 705R with the additional benefit of being intrinsically safe.





## DPI 740 Barometer

Accurate and highly cost effective handheld precision barometer with ranges to 103 inHg absolute calibrator/ pressure indicator /barometer

### Key Features:

- Accuracy up to  $\pm 0.004$  inHg ( $\pm 0.15$  mbar) absolute
- Ranges to 103 inHg (3.5 bar) absolute
- Simple, easy to use and robust design
- 6 digit resolution LCD display
- Multiple pressure scales and aeronautical units
- Lightweight hand-held rugged design
- RS232 output



The handheld and battery-powered Druck DPI 740 barometer delivers excellent performance in a compact package. GE's advanced vibrating sensor element contained inside the instrument not only provides accuracies up to  $\pm 0.004$  inHg ( $\pm 0.15$  mbar), but delivers a calibration stability of better than 100 ppm per year. The Druck DPI 740 barometer is widely used in laboratory and remote field applications for precision pressure reference.

Portable battery powered precision barometer, providing outstanding capabilities in a hand-held package. This instrument can be used in both laboratory and field applications as a first-class barometric reference device, with the recommended recalibration period being one year.



### Key Features:

- Ranges from 700 mbar to 1400 bar (10 psi to 20,000 psi)
- 0.05% FS Accuracy
- Large, easy to read display with five digit resolution
- Pressure switch test, Min/max, tare & alarm functions
- PV Pump kits available
- Complete with rubber boot to ensure total protection of your tool



The DPI 104 Digital Test Gauge is a microprocessor-controlled digital pressure gauge that combines precision and functionality in a compact, robust and simple-to-use package. The DPI 104 uses advanced silicon sensor technology with several convenient design features resulting in an accurate, versatile yet affordable digital test gauge. Supplied as a stand-alone process indicator or in a kit with the widely proven Druck hand pumps, the DPI 104 provides a reliable and economic solution for a wide range of pressure sensing applications.

### DPI 104 (IS) Digital Test Gauge, Intrinsically Safe

The DPI 104 IS Digital Test gauge is the intrinsically safe version of the microprocessor-controlled DPI 104 digital pressure gauge.



# Hand Pumps

## Easy-to-use, Accurate and High-Quality

GE Druck's PV hand pump range consists of fully portable pneumatic, hydraulic and vacuum pumps. Hand pumps are an essential part of any pressure test or calibration system. These high quality, high performance hand pumps are designed for ease of use and reliability. Models are available to suit the widest range of applications from very low to high pneumatic pressures and for very high pressure hydraulic systems. A choice of adaptors and hoses simplify device connections, reduce leakage and improve safety and for convenience there are flexible pump kits.

### PV 210 Low Pressure Pneumatic Pump

#### Key Features:

- Dual source of pneumatic pressure & vacuum
- Generate vacuum to 90% (21 inHg)
- Generate pressure to 3000 mbar
- Adjustable pressure relief valve for setting maximum output pressure
- Integral fine control & pressure release valve
- Lightweight, handheld, easy to use
- Use with DPI 104 Gauge



The PV 210 is a combined vacuum and low pressure pneumatic hand pump which generates pressures up to 3bar/45 psi, down to 90% vacuum. It is the ideal tool for applying low pressure for test and calibration of transmitters, sensor gauges, pressure switches, indicators, recorders and controllers. It can be used in conjunction with various pressure indicating devices. It is thermally insulated to eliminate temperature effect and has a unique user adjustable pressure relief setting enabling setting of maximum pressure.

## PV211 Pneumatic Pressure and Vacuum Pump

### Key Features:

- Dual source of pneumatic pressure & vacuum
- Pneumatic pressure in excess 40 bar (600 psi)
- Generates vacuum to – 950 mbar (28.5 inHg)
- Adjustable stroke Built-in fine adjust Vernier
- Needle valve for controlled pressure release
- High pressure generation with minimal effort
- Use with DPI 104 Gauge



The PV211 is a light-weight, high quality pressure and vacuum hand pump. It has a dual source of pneumatic pressure and vacuum with pneumatic pressure in excess of 40bar (600 psi), and generates vacuum to -950 mbar (-28.5 Hg). The unit includes an adjustable over pressure protection system as standard.

## PV212 Hydraulic Pump

### Key Features:

- Hydraulic pressure up to 700 bar (10,000 psi) or 1000 bar (15,000 psi)
- Large transparent 100cc capacity reservoir
- Quick priming & pressure generation using scissor action
- Controlled pressure release & adjustment
- High pressure / priming selector
- Use with DPI 104 Gauge



The PV212 Hydraulic Hand Pump can also be used as a portable pressure comparator in conjunction with various pressure indicating devices. It is compatible with distilled water or mineral oil and can be filled even under pressure. Available in two pressure ranges 700 bar (10,000psi) or 1000 bar (15,000 psi), it offers adjustable overpressure protection, fine control and a unique priming/high pressure selector switch.



# Multifunction Hand Pump

## PV411A Multi-Function Pump

### Key Features:

- Multi-function “4 in 1” hand pump
- Pneumatic pressures to 40 bar (600 psi)
- Hydraulic pressures to 700 bar (10,000 psi)
- Generates vacuum to – 950 mbar (28.5 inHg)
- Vacuum priming for hydraulic systems
- Excellent low pressure control
- Adjustable overpressure protection
- Use with DPI 104 Gauge



The revolutionary PV411A (4 in 1) multi-function Pressure generator is remarkable hand pump for generating vacuum, gas and hydraulic pressures from a few mbar up to 700 bar. It has the versatility to replace four conventional hand pumps, removing the need to carry several hand pumps.

Ideal for test and calibration of pressures to sensors, gauges, switches, indicators and recorders.

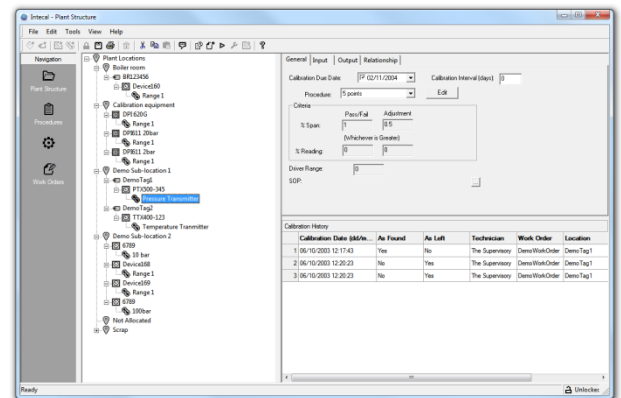


# Software

## Intecal v10 Calibration Management Software

### Key Features:

- Easy to use calibration management software
- Downloads and stores calibration data along with asset tag numbers and pass/fail reports.
- Generates procedures to automate common calibrations processes
- Produces calibration work schedules
- Generates calibration reports which can be digitally stored or printed
- Data can be entered manually



Intecal v10 is a simple, easy to use and yet powerful software application for managing calibration cycles and historical data of process instrumentation. It provides an asset database with defined procedures that can be downloaded to portable field calibrators or run in real-time with workshop and laboratory calibration equipment.

## Other Calibration Products in GE's Druck Range



DPI 620 Genii multifunction Calibration System



DPI 611 and DPI 612 Pressure Calibrators



PACE Pressure indicators and controllers



Temperature Dry Block Calibrators



