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MISURA & AUTOMAZIONE

Druck
a Baker Hughes business

# Power at your fingertips

Calibration and maintenance solutions for the power sector

druck.com

# The importance of calibration and maintenance in the power industry

## Power industry challenges

Running a power generation facility is not straightforward. Power generators operate in an increasingly competitive market place with new forms of power generation coming online almost every day. Distributed generation, such as wind or solar, is providing increasing competition for established generators and keeping them on their toes. Environmental regulations provide another set of challenges that generators must meet in order to continue operating. Finally, electricity demand is growing, putting further pressure on generators to meet higher load factors. Operating a power plant in the most efficient, safe and economic way is now more important than ever.

## Calibration in the power industry

Ensuring the turbine and generator systems are operating at their most efficient configurations is a key driver for the competitiveness of power plants. Just a small percentage drift away from the most optimum operating setpoints could impact the bottom line of the business by millions of dollars. Alternatively, allowing emissions to exceed permitted levels could incur huge fines to operators as well as environmental damage. Modern power plants rely on many hundreds of process sensors, transmitters, switches, and gauges around the plant covering pressure, temperature, electrical and other parameters to maintain optimum operational performance. However, the accuracy of these sensors is only as good as their most recent calibration. Accuracy and stability of sensors can drift over time. New sensors are installed and require accurate calibration before they can give reliable and true readings. Calibration is an essential service for any power generator to deliver maximum operating efficiency and meet their regulatory obligations.

### Key messages:

- **Market increasingly more competitive for power generators**
- **Achieving improved efficiency at low cost while meeting stringent regulations is key**
- **Sensors and instruments are essential and their data must be accurate and reliable**
- **Calibration is a vital activity for power generators**
- **Reducing measurement uncertainty can potentially increase electrical power output by up to 2%**



# The Druck range:
## Providing dependable calibration solutions to power operators for over 40 years

### Fast, accurate, cost effective calibration

Druck's range of calibration instruments and process plant test tools embody almost 50 years of heritage and design expertise. During that time, customers have told us the calibration instrumentation and process test tools must be:

- Highly accurate
- Reliable and heavy duty
- Cost effective
- Easy to use thereby ensuring high productivity
- Able to be integrated to wider plant software

That's why Druck's range of calibration instruments and process plant tools are all designed to be rugged, highly accurate and always cost effective to use. Plus when combined with our advanced 4Sight2 software, Druck provides a comprehensive calibration solution suited to any power plant. Our range is trusted by power customers worldwide.

### Built around our own sensors

At the heart of any calibration instrument or process plant test tools are the sensors. They determine the accuracy, stability and re-calibration period. That's why Druck's calibration instrument range uses our own sensors, designed and manufactured completely in-house. We're one of the few calibration instrument OEMs who manufacture their own sensors. We believe it's the best way to deliver instrument accuracy and stability that customers need.

| Model | Accuracy | Ma | Mv | V | Hz | RTD | Pressure | Pressure Source | Thermo-couple | Head Source | HART/ Fieldbus Coms | Documenting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPI 620 Genii Test and Calibration System | Reference Standard | S | S | S | S | S | S | S | S | | HART:S FF: 0 | S |
| DPI 611 Pressure Calibrator | Reference Standard | S | S | S | | | S | S | | | | S |
| DPI 612 Pneumatic/Hydraulic Pressure Calibrator | Reference Standard | S | S | S | | | S | S | | | | S |
| Temperature Calibrator | Reference Standard | | | | | | | | | D,L,IR | | |
| DPI 880 Multi-function Calibrator | High | S | S | | S | S | O | | S | | | O |
| DPI 802 Pressure Indicator | High | S | | | | | S | | | | | O |
| DPI 812 RTD Loop Calibrator | High | S | | | | S | O | | | | | O |
| DPI 822 Thermocouple Calibrator | High | S | | | | | | | S | | | O |
| DPI 832 Electrical Loop Calibrator | High | S | S | S | | | O | | | | | O |
| UPS-III | High | S | | S | | | | | | | | |
| DPI 705E | High | | | | | O | S | | | | | |

**Reference Standard Accuracy** = Our highest accuracy. Suitable for virtually all instrument tests and calibrations
**High Accuracy** = Suitable for general instrument tests and calibrations
**S** = Standard Feature **O** = Optional Feature or Module **D** = Dry block **L** = Liquid Bath **IR** = Infrared

# Druck Calibration Instruments

Our most accurate and sophisticated instruments covering pressure, electrical and temperature parameters. Perfect for scheduled calibrations, daily maintenance or troubleshooting, as well as configuring a new sensor or transmitter set up.

## Druck DPI 620G
## Genii Test and Calibration System

**Multi-function high-accuracy field calibrator and communicator:**

- Calibration capabilities for simultaneous measurement and sourcing pressure, temperature, electrical and frequency signals
- HART/Fieldbus communication options
- Easy, leak free pressure generation options up to 1,000 bar/15,000 psi
- Intuitive touch screen user interface with multiple languages
- Accuracy from 0.006% RDG + 0.005% FS for mA and 0.005% FS for pressure
- Interchangeable, hand tighten pressure modules for range expansion
- Documenting – automated procedures, PASS/FAIL errors, results storage

**Safe and Hazardous area versions available**

## Druck DPI 611
## Pressure Calibrator

**Compact high accuracy handheld pressure calibrator with integrated pump:**

- Fast acting: generates 0 to 20 bar/300 psi within 30 seconds
- Creates 95% vacuum
- 0.0185% FS accuracy
- Simple and intuitive colour touch screen
- Fast, three-touch launch for any menu application
- Quick-to-fit, no leak adaptor and hose system requires no tools or sealing

## Druck DPI 612
## Pneumatic/Hydraulic Pressure Calibrator

**The complete pressure calibrator – pump, pressure, analyse:**

- Fast and dependable from vacuum to 100 bar/15,000 psi
- No in-the-field leaks with quick-to-fit pressure adaptors and hoses
- Fast acting: generates 0 to 20 bar/300 psi in 30 seconds
- Up to 0.005% FS accuracy
- Calculates PASS/FAIL errors, documents results and interfaces with calibration software

## DryTC 165/650 & LiquidTC 165/255
## Temperature Calibrators

**Dry block or liquid bath temperature calibrators:**

- Temperature ranges from -35°C to 650°C
- Multifunctional LiquidTC models with interchangeable liquid baths, dry inserts and IR black body source
- Accuracy from 0.1°C and stability 0.05°C
- Liquid TC165/TC 255 accuracy from 0.1°C and stability 0.05°C

[ Druck provides a comprehensive calibration solution suited to any power plant ]

# Druck Parameter Test Tools

[ Cost-effective, highly accurate and packed with features ]

Druck's Test Tool series are ideally suited to testing and maintaining the most popular process parameters on a power plant. Cost effective, handheld yet still highly accurate and packed with features, they make fault finding effortless.

## The DPI 800 family

The DPI 800 family provides cost effective tools ideal for test/calibration of many popular process parameters:

**Common features across the DPI 800 series platform include:**

- Plug and Play (PnP) Pressure modules up to 700 bar / 1,000 psi
- Large backlit display, menu driven interface
- Convenient, one-handed operation
- 24V loop power
- HART® loop resistor

### DPI 880 Handheld Multi-function Calibrator

- Measure and source pressure, temperature, electrical and frequency signals
- Simulates and reads 8 RTDs and 12 thermocouples

### DPI 802 Handheld Pressure Indicator

- Pressure ranges from 25 mbar to 700 bar/0.36 to 1,000 psi
- Single or dual range configuration with accuracies 0.05% FS (standard) or 0.01% FS (precision)

### DPI 812 Handheld RTD Loop Calibrator

- Measure and source RTDs with 0.02% accuracy of reading + 3 counts
- Auto detection of 2, 3 and 4 wire

### DPI 822 Handheld Thermocouple Calibrator

- Measure and source thermocouples
- mA measure, switch test and 24V loop power

### DPI 832 Handheld Electrical Loop Calibrator

- Dual reading capability: source mA, mV, or V and simultaneously measure mA or capture switch trip values
- 24V loop supply to power transmitters and loops

### PV Hand Pump & DPI 104 Indicator Packages

- Pneumatic pressure/vacuum or hydraulic generation from 3 bar/40 psi up to 1,000 bar/1,500 psi
- DPI 104 pressure indicator gauge up to 1,400 bar/20,000 psi

**Safe and Hazardous area versions available**

### UPS-III Rugged and Extremely Compact Loop Calibrator

- Measure and source 0 to 24 mA, with dual mA and % readout, linear or flow
- Accuracy 0.01% of reading

**Safe and Hazardous area versions available**

### DPI 705E Pressure Indicator

**Our new DPI 705E digital pressure and temperature indicator provides high accuracy pressure and temperature readings. Now with plug and play sensors, a single instrument can fit any remote sensor to swap pressure ranges in seconds.**

- 48 pressure ranges from ±25 mbar (±1.69 psi) through to 1,400bar (20,000 psi)
- Total 1 year uncertainty up to 0.05% full scale (FS)
- Integral calibration record with calibration due count-down display
- Rugged, handheld design with backlit high-contrast display
- Leak test, tare, max/min and filter
- Optional remote plug and play pressure and RTD temperature sensor

**Safe and Hazardous area versions available**

### TERPS PM

**The PM620 now incorporates our range of TERPS resonant silicon pressure technology. Providing up to four times greater stability and higher accuracy than current competing pressure measurement technologies.**

- Total uncertainty from 0.0125% FS
- Temperature compensated accuracy from -10°C to 50°C (-14°F to 122°F)
- Simple screw fit – hand tighten, no tools required
- Fully interchangeable with no need for set-up or calibration
- Ranges from 1.2 bar to 100 bar (17.5 psi to 1,500 psi)

**Safe and Hazardous area versions available**

# 4Sight2 Calibration Management Software

Developed totally in-house, 4Sight2 is designed to deliver actionable intelligence and transformative insights. Our software solution enhances the visibility of your assets and data, helping to plan resources that enable effective maintenance, improve process efficiency and demonstrates regulatory compliance.

4Sight2 employs web application technology and is highly scalable from a single computer up to a global enterprise solution and is designed to empower your organisation to operate simply and securely, connecting your people to instruments, data and analytics.

Our bespoke software significantly reduces the risk of defects in the calibration data, examples of which include fabricating data, transposition errors and incorrect calculation of the pass/fail result. Improved quality calibration data within 4Sight2, drives improvement in manufacturing processes, leading to more efficient outputs and higher quality and safer outcomes.

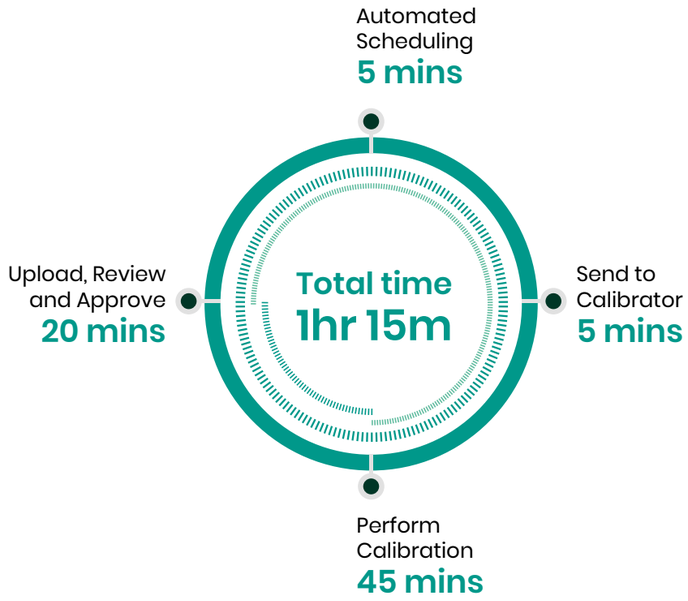
# Calibration Unified by Druck

### The new dynamic 4 Stage Process

Calibration Unified from Druck delivers effective and consistent calibration. This is achieved from automation and combining people and process with calibration technology that encompasses hardware and software. Enabled by the adoption of web application technology, Calibration Unified is scalable from a single computer up to a global enterprise Cloud solution.

**Benefits of Calibration Unified:**

- Resource, cost and time savings
- More effective and consistent calibration processes
- Improved data quality
- Assured traceability for quality or audit requirements
- Demonstrable compliance for regulated companies



# Sensors

## UNIK 5000 Series

**High performance industrial grade product, designed to meet the needs of multiple markets on a short lead-time. Using Druck components our modular design process offers over 200 million configurations to meet your specific needs.**

Features include:

- **Pressure Range:** 70 mbar (1 psi) up to 700 bar (10,000 psi)
- **Operating Temperature Range:** -55ºC to +125ºC (-67ºF to 257ºF)
- **Voltage Outputs:** mV, mA, voltage and configurable voltage outputs
- **Accuracy:** to +0.04% Full Scale year (FS) Best Straight Line (BSL)
- **Pressure and Electrical Connections:** Multiple
- **Construction:** Stainless steel
- **Frequency response:** to 3.5 kHz
- **High over pressure capability**

**Safe and Hazardous area versions available**

## UNIK 5900 SIL

**Compact and rugged, the UNIK 5900 SIL pressure sensing platform offers an intrinsically safe, flameproof/explosion proof or dust ignition protection by enclosure capability as required. It provides a cost-effective alternative to pressure gauges and switches in process and oil and gas industry applications with SIL certification.**

Features include:

- **Pressure Range:** from 2 to 700 bar (30 to 10,000 psi)
- **Non-linearity, hysteresis and repeatability to:** ±0.04% Full Scale (FS) Best Straight Line (BSL)
- **Frequency response:** to 3.5 kHz
- **Hazardous area certifications**
- **SIL certification**
- **Long Term Stability:** ±0.05% FS/year typical (±0.1% FS/year maximum)

## DPS 5000 CANBus

**Digital pressure sensing platform.**

Features include:

- **Pressure Range:** from 200 mbar to 700 bar
- **Accuracy:** Total accuracy to ±0.1 % FS
- **Construction:** Stainless steel
- **Operating Temperature Range:** Wide temperature range -40ºC to 125ºC
- **Fast update rate 1 ms**
- **Customer set filter setting**
- **Baud rate up to 1,000k bit/s**
- **Excellent long-term stability**

## DPS 8000 TERPS

**TERPS (Trench Etched Resonant Pressure Sensor) uses resonant silicon sensing technology to give the highest performance available from a pressure sensor. Designed for applications where ultimate accuracy and stability are required in a robust industrial package.**

Features include:

- **Pressure Range:** 1 bar (15 psi) up to 70 bar (1,000 psi)
- **Operating Temperature Range:** from -55ºC to +125ºC (-67ºF to 257ºF)
- **Multiple Output configurations:** RS232, RS485, USB 2.0, CANBus, Frequency & Diode (TTL)
- **High precision:** +0.01% FS over compensated temperature range
- **High Stability:** +50 ppm FS/year (typical)



# Our services

Accredited to ISO17025, our global network of laboratories provides local support for the repair and calibration of all Druck instrumentation and sensors.

A Druck Assured Service Plan is the best way to protect and maintain your Druck assets such as our Premier Service Plan covering corrective and preventative maintenance on your instrumentation. However, we also offer calibration, repairs, spare parts, training, rentals, health checks and upgrades to your equipment.

## Druck assured service plans:

Peace of mind that only the original equipment manufacturer can deliver. Druck provides much more to protect and prolong the life of your instrument. Our experienced Customer Services Team are ready to respond to your technical enquiries, whether you require remote, off-site or on-site support. Plus, when combined with our advanced 4Sight2 software, Druck provides a comprehensive calibration solution suited to any power plant. Our range is trusted by power customers worldwide.

For more information please contact your local Druck representative, or visit:

**druck.com**

### Accredited calibration

1 **High quality calibration**
We will ensure the specification of your instrumentation is maintained by using suitable reference standards.

2 **Comprehensive health check**
Complete system optimisation including Leak Tests, Control Checks, Tuning and Valve Characterisation.

3 **Faster repairs**
As the OEM, we are best placed to identify issues during calibration, limiting the delay in repairs associated with using third-party calibration houses.

4 **Software upgrades**
Gain access to enhancements and new functionality to increase the performance of your Druck instrumentation.

5 **Hardware warranty**
Follow all of Druck's additional warranty recommendations and gain a 3 month warranty on your instrumentation.

### High quality repairs

1 **OEM standard repairs**
Only Druck approved components are used to ensure that your instrument is returned to its original specification.

2 **Extended warranty**
New components fitted as part of a major repair will be covered by a 6 month warranty.

**[ The heart of any calibration instrument or process plant test tool are the sensors ]**

We are a global technology company that designs, develops and manufactures the highest quality, most accurate and reliable customized pressure sensing devices and instruments, software and services. We leverage innovation, continuous improvement and unprecedented quality, to enable our Customers to successfully operate, produce systems, monitor and/or control mission-critical assets in tough environments across the world's most challenging applications.

We delight customers with tailored solutions that address their challenges; embodying our deep domain knowledge of customers' applications, the most innovative and high performance connected pressure sensing devices, instruments, software and services; produced with the highest standards of safety, quality and delivery.

**We are Druck. We provide peace of mind in the toughest environments.**

## Contact us

For more information please contact your local Druck representative, or visit:

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