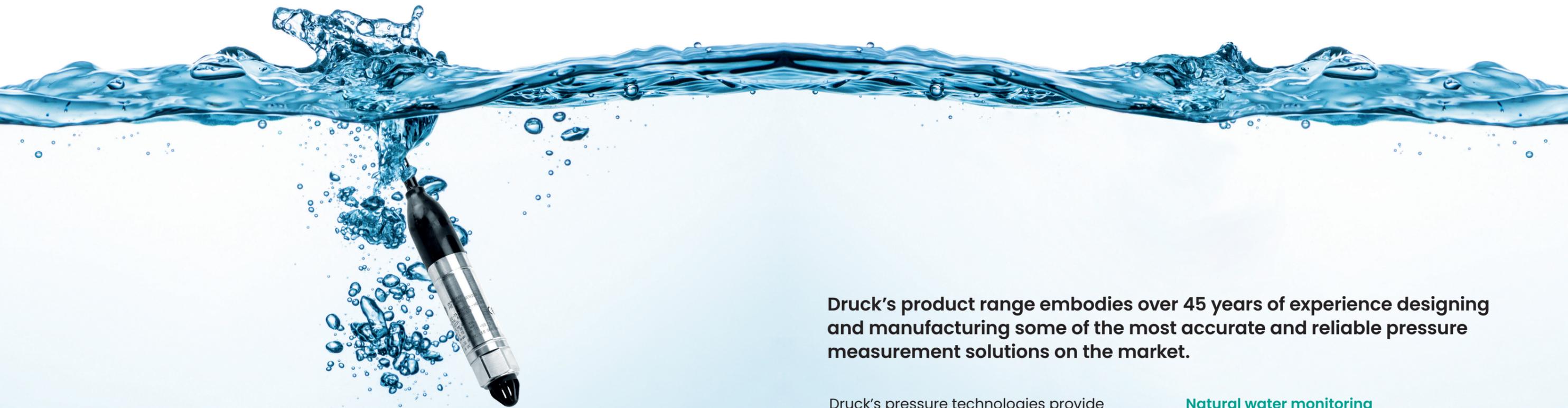


# Accuracy under pressure

Hydrology data you can rely on



# Built for accuracy and precision, Druck's pressure sensors provide peace of mind in the toughest environments

**Druck's product range embodies over 45 years of experience designing and manufacturing some of the most accurate and reliable pressure measurement solutions on the market.**

Druck's pressure technologies provide peace of mind that you are getting the reliable data that you need, to make the right decisions to keep your business and equipment running efficiently.

We are one of the only sensor manufacturers to make the silicon sensing element in-house at our multi-million dollar clean room facility in the UK. As a result, we are able to ensure the highest quality and performance in delivering world class, highly accurate pressure sensors.

Monitoring the quality and quantity of surface and ground water can be categorised into three key areas:

## **Natural water monitoring**

The natural water environment is both hostile and remote. Reliability is critical to quality data collection, particularly when power is in short supply and service is expensive.

## **Drinking water**

High quality drinking water is a valuable resource. Managing this essential asset requires precision instrumentation across the entirety of the drinking water network.

## **Waste water management**

In waste water management you must have confidence in the durability of your instrumentation. When faced with unpredictable content and a challenging environment, robust construction is key for reliable data collection.

Since 1972, Druck products have successfully applied technological innovation and application focus to a diverse and demanding world of pressure. Our sensor technology has been developed to support some of the most rigorous, challenging and precise applications, making it highly suited for these hydrology applications.

# Challenges in natural water monitoring

Extreme temperatures

Very remote and hostile environments

Lightning strikes

No line of sight

Narrow bore wells

Salt corrosion

Difficult to access areas for installation, repair and calibration

Vandalism

Independent power supply required

Surface debris and foaming

Shallow water or dry river beds

Underwater debris

Large changes in depth

Silting

# Solutions in natural water monitoring

All our components are designed and built to perform in the most hostile of environments.

## Remote applications

### • Independent power supply required

Piezo resistive sensing elements and analogue electronics enable pulse power operation with readings taken in as little as 10 ms. This significantly reduces energy consumption. Voltage outputs reduce current consumptions to a few mA and in short cable run applications, mV output sensors reduce the power on time and current consumption even more. SDI-12 digital electronics use a standby mode and fast read cycles to keep sensor use to a minimum. This minimises the requirements for expensive batteries or solar chargers.

### • Difficult to access for repair or calibration

High stability silicon sensing elements in robust packaging ensures accurate and reliable performance over long periods. This minimises the need to visit sites for the repair of faulty components and extends the periods between routine visits for calibration.

## Hostile Environments

### • Silting

The risk of silting is reduced by connecting the pressure sensing element to the media through a carefully designed pressure port. Soft nose cones both protect the sensing element from physical shock damage and are easily removed allowing access to the open face connectors, which enable gentle cleaning in extreme circumstances.

### • Debris

Fully welded construction in high quality materials, injection moulded to the thick cable sheathing, ensure both the highest IP rating and reduce the risk of damage from debris moving in turbulent and fast moving water.

### • Extreme temperatures

The use of high-quality electronic components allow options to accurately measure temperature ranges from -40c to +125c

### • Salt corrosion

Titanium construction can give you confidence in the long and reliable operation of our sensors in salt water environments, while many years of corrosion free service minimise expensive site visits.

### • Lightning strikes

By building lightning surge arrestors into the sensor (on the electronics end of the inductance and capacitance of the cable) the best protection in lightning affected areas can be offered. This helps to ensure the longest possible life in the field, thereby lowering the cost of ownership.

## Difficult installation sites

### • Surface debris and foaming

By measuring the pressure at depth in order to calculate level, Druck pressure based level sensors are immune from incorrect readings caused by surface debris or foaming that will cause errors in line of sight based devices like ultrasonic or radar.

### • Narrow bore wells

With a sensor diameter as small as 17.5mm, units can be deployed in narrow wells reducing drilling costs. Cable in all models incorporates a Kevlar core which provides strength to allow long cable drops and minimises cable extension under loading. Accessories, link sink weights and cable clamping mechanisms, have been designed to make installation easy and ensure maximum life.

### • No line of sight

Sloping banks and obstructions like trees make some sites very difficult for line of sight methods. Pressure sensors can be installed in the deepest part of a river with an unobtrusive cable to bring the level information back to instrumentation.

### • Shallow water or dry river beds

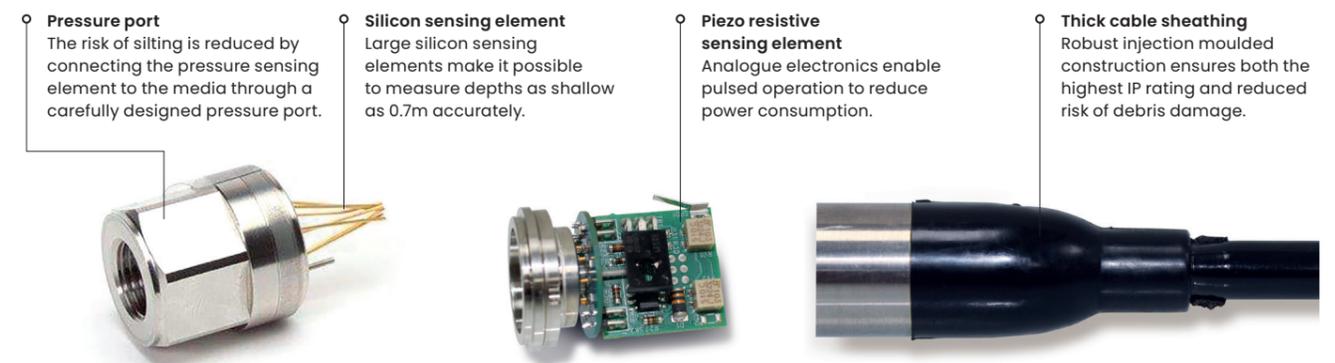
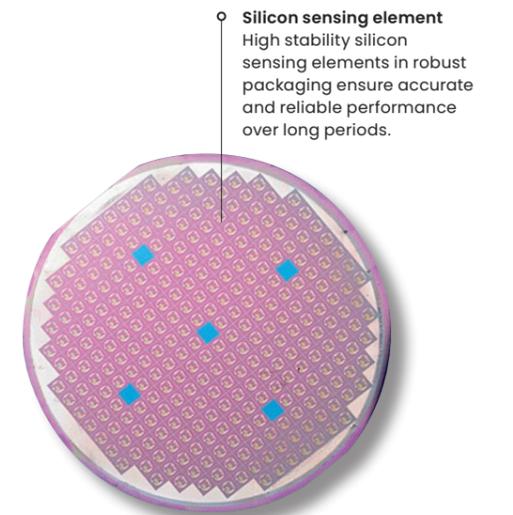
Large silicon sensing elements make it possible to measure depths as shallow as 0.7mm accurately. This makes accurate level measurement in V notch flow meters possible, where small changes in the water level results in a large change in flow.

### • Vandalism

Using pressure to measure level is unobtrusive, with much of the equipment hidden underwater. This reduces the instances of installation being damaged by acts of vandalism.

Natural water monitoring challenges	1800 series	UNIK 5000	DPS 8000 (TERPS)	DPS 5000 I°C	DPS 5000 SDI 12
Low power	★	★		★	★
Long service interval	✓	✓	★	✓	✓
Silting	★	✓	✓	✓	✓
Debris	✓	✓	✓	✓	✓
Extreme temperatures		★	★	★	✓
Salt corrosion	★	✓	✓	✓	★
Lightning	★				★
Surface debris and foaming	✓	✓	✓	✓	✓
Narrow bore wells	★	✓	✓	✓	✓
No line of sight	✓	✓	✓	✓	✓
Shallow water	✓	✓		✓	✓
Wide variation of depth	✓	✓	✓	✓	✓
Vandalism	✓	✓	✓	✓	✓

✓ Options are available to address this challenge  
 ★ This product has a feature specifically designed to address this challenge



[ Reliability when you need it most ]

# Challenges in drinking water

Limited spaces in bore holes

Compatibility with treatment chemicals

Difficult to access for repair or calibration

Used across large surface areas

Monitoring subtle changes over long periods of time

Needed in remote, inaccessible locations

# Solutions in drinking water

Each one of our components is designed and built for reliability at every stage of the cycle.

- **Limited space in bore holes**

17.5mm diameter construction reduces the size of bore holes required minimising drilling costs for water extraction. The stiffness of titanium allows narrow body construction without compromising performance or stability. High quality screened cable and 4-20 mA signals are mechanically robust and immune from electro-magnetic interference from electric motors on pumps.

- **Large surface areas require the highest levels of accuracy**

Many new dam constructions have shallow slopes making vertical line of sight technology very expensive to install. TERPS technology allows accurate measurements better than 0.01% (1mm in 10m depth) to allow the most efficient resource management of reservoirs. Digital compensation in our DPS5000 products provides high accuracy when temperatures change.

- **Monitor subtle changes over long periods of time**

Excellent long term stability allows drinking water systems to be accurately monitored. This enables small changes in pressure profiles, caused by leakage, to be quickly seen and located. This can be used to reduce leakage and repair costs.

- **Compatibility with treatment chemicals**

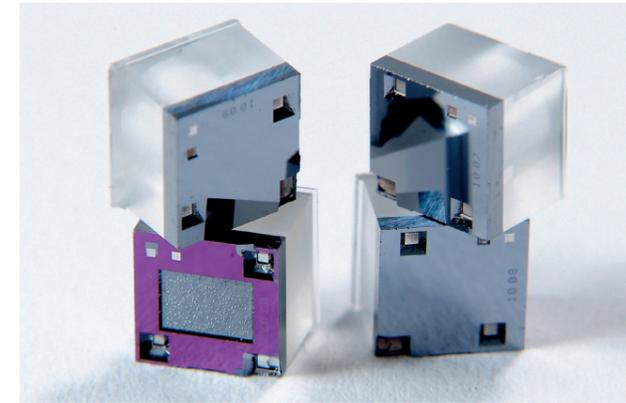
Titanium and stainless steel construction married to cables made of polyurethane or Hytel enable the best materials to be selected for compatibility with water treatment chemicals. This becomes particularly important in dosing stations or storage tanks where the concentrations can be high.

- **Difficult to access for repair or calibration**

High stability silicon sensing elements in robust packaging ensures accurate and reliable performance over long periods. Accordingly, this minimises the need to visit sites for repair of faulty components and extends the periods between routine visits for calibration.

- **Inaccessible locations, inspection chambers**

Small size, fully welded construction and IP68 to 700m cable connections mean that Druck products give reliable operation in sub surface applications that are prone to flooding. Particularly useful is this feature in differential sensors for use on filters or valves.

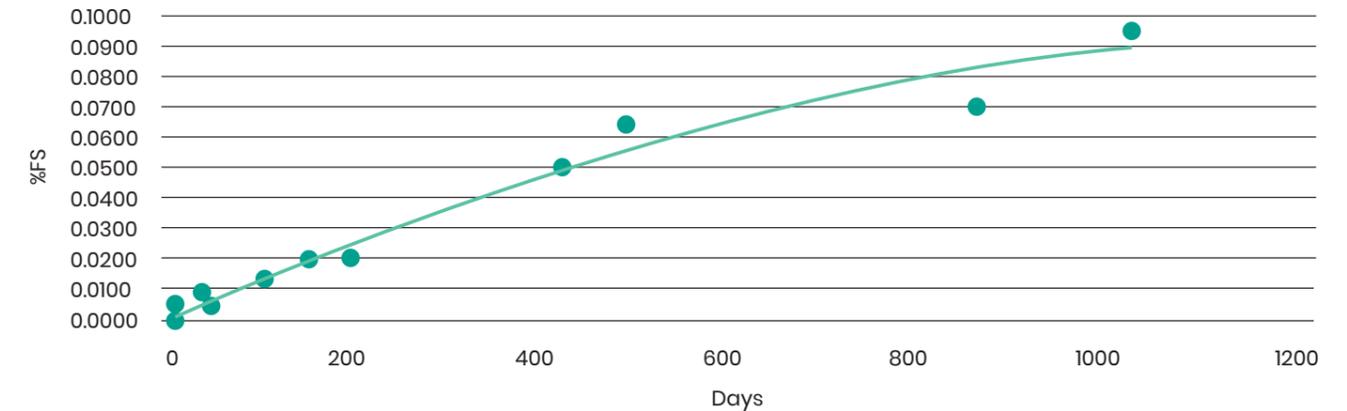


Trench Etched Resonant Pressure Sensor: TERPS

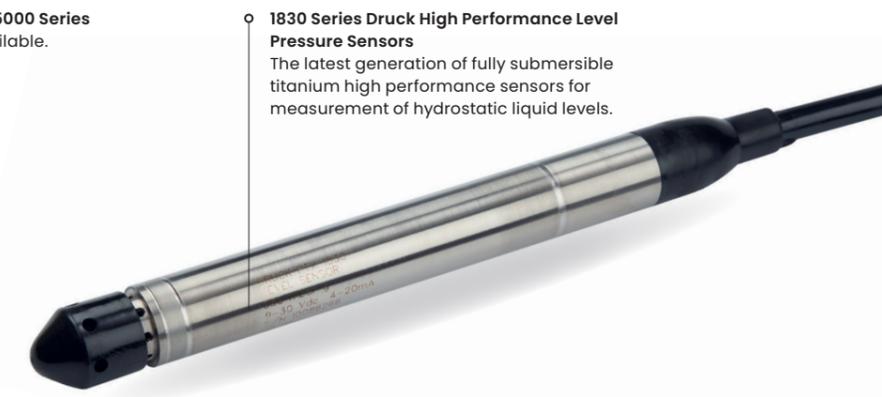
Drinking water monitoring challenges	1800 series	UNIK 5000	DPS 8000 (TERPS)	DPS 5000 I°C	DPS 5000 SDI 12
Narrow bore wells	★	✓	✓	✓	✓
Highest accuracy	✓	✓	★	✓	✓
Low power	★	★		★	✓
Long service intervals	✓	✓	★	✓	✓
Subtle changes over long time	✓	✓	★	✓	✓
Media compatibility	★	✓	★	✓	★
Differential measurements		★			

✓ Options are available to address this challenge  
 ★ This product has a feature specifically designed to address this challenge

Typical stability performance for UNIK5000, DPS5000 SDI-12 and 1800 series



Differential UNIK5000 Series IP68 versions available.



1830 Series Druck High Performance Level Pressure Sensors  
 The latest generation of fully submersible titanium high performance sensors for measurement of hydrostatic liquid levels.

[ Precision with every drop ]

# Challenges in waste water management

Blocked line of sight and surface foaming

Difficult to access for repair or calibration

Silting

Used in areas of low pressure

Extreme temperatures

Explosive atmospheres

No power available

May come into contact with violently moving debris

# Solutions in waste water management

All our components are designed and built for stability, no matter what the conditions.

## • Contact with violently moving debris

Our products are designed to be robust in what can be a violent application where waste can carry heavy objects which can damage level sensors.

Features to cope with this environment include:

- Fully welded construction in stiff titanium or tough stainless steel
- Injection moulding of the electrical cable to the sensor body ensures the IP68 rating is maintained, guaranteeing the integrity of the sensors
- Thick cable walls made of tough polyurethane or stiff chemically robust Hytrel
- Kevlar cable core supply strength – preventing cable stretching.

## • Unknown chemicals

Titanium or stainless steel metal work with polyurethane or Hytrel cable can be chosen to reduce the risk of chemical corrosion damaging sensors.

## • Silting

The risk of silting is reduced by connecting the pressure sensing element to the media through a carefully designed pressure port. Soft nose cones both protect the sensing element from physical shock damage and are easily removed, allowing access to the open face connectors that enable gentle cleaning in extreme circumstances.

## • No power available

Piezo resistive sensing elements and analogue electronics enable pulse power operation, with readings taken in as little as 10 ms. This significantly reduces energy consumption. Voltage outputs reduce current consumptions to a few mA and in short cable run applications, mV output sensors reduce the power on time and current consumption even more, which, in turn, minimises the requirements for expensive batteries or solar chargers. Digital electronics use low power standby mode and read cycles to reduce total energy requirements.

## • Explosive atmospheres

Waste water can release explosive methane. This means that many chambers are designated as hazardous areas. Products used in these areas need to be certified as safe for use. Druck pressure sensor products carry a wide range of certifications for use in such areas allowing installation using different safety rules to suit the application and validity in most countries around the world.

## • Blocked line of sight and surface foaming

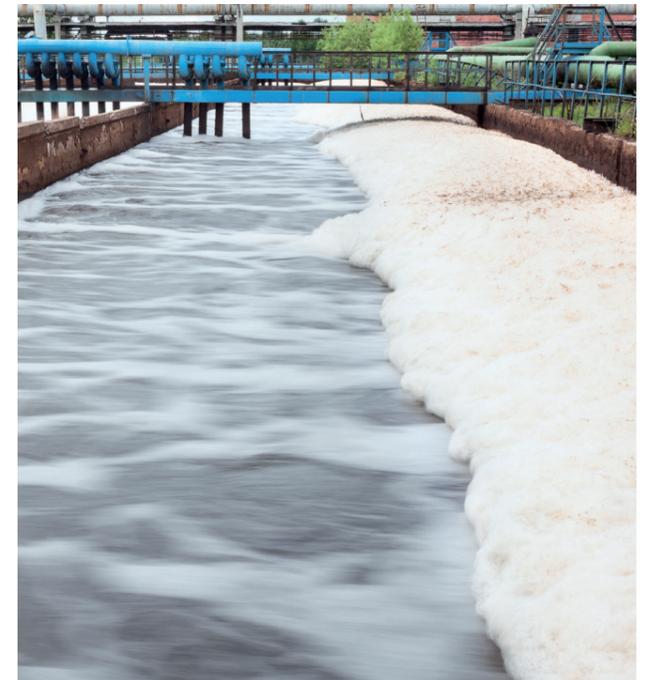
By measuring the pressure at depth in order to calculate level, Druck pressure-based level sensors are immune from incorrect readings caused by obstruction in tanks or chambers as well as surface debris or foaming that will cause errors in line of sight based devices in ultrasonics or radar.

## • Used in areas of low pressure

Many waste water applications are in shallow drains where the level of water in normal conditions is very low. Druck pressure sensors use silicon sensing elements made in our own clean room. In order to enable highly sensitive low pressure measurement, particularly in large surface areas, thin elements are used. This makes it possible to measure pressures with a full scale reading as low as 0.7 mH<sub>2</sub>O (70 mbar, 1psi).

Waste water management challenges	1800 series	UNIK 5000	DPS 8000 (TERPS)	DPS 5000 1°C	DPS 5000 SDI 12
Debris	✓	✓	✓	✓	✓
Unknown chemicals	★	✓	✓	✓	★
Low power	★	★		★	✓
Shallow depths	✓	✓		✓	✓
Explosive atmospheres	✓	★		✓	

- ✓ Options are available to address this challenge
- ★ This product has a feature specifically designed to address this challenge



**1830 nose cone**  
Designed to operate in high silting environments.



**Electronics**  
Analogue electronics enable pulsed operation to reduce power consumption.



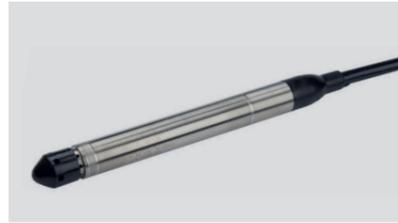
**Media compatibility**  
Choice of polyurethane or Hytrel cable.



**Depth cable**  
Moulded directly to the sensor body to give Type 6/IP68 rating for permanent immersion.

[ Providing performance against all odds ]

# Our products



## 1800 Series

**Pressure Range:** from 70 mbar (1 psi) to 700 bar (10000 psi)  
**Accuracy:** to 0.06%  
**Fully welded 17.5mm titanium construction**  
**Integral lightning surge arrestor option**  
**Polyurethane and hydrocarbon resistant cables**  
**Full range of installation accessories**



## UNIK5000 Series

**Pressure Range:** from 70 mbar (1 psi) to 700 bar (10000 psi)  
**Accuracy:** to 0.04% Full Scale (FS) Best Straight Line (BSL)  
**Frequency Response:** to 3.5 kHz  
**High over pressure capability**  
**Hazardous Area certifications**  
**Full range of installation accessories**  
**mV, mA, voltage and configurable voltage outputs**  
**Multiple electrical & pressure connector options**  
**Operating Temperature Range:** from -55 to 125C (-67 to 257F)



## DPS8000 (TERPS)

**Pressure Range:** 2 bar (30 psi) to 200 bar (3000 psi).  
**High Precision:** +0.01% FS over compensated temperature range  
**High Stability:** +100 ppm FS/year  
**Designed with TERPS technology**  
**Welded 316L construction**



## DPS5000 I²C

**Pressure Range:** from 70 mbar to 100 bar  
**Accuracy:** to 0.1% FS  
**Stainless steel construction**  
**3V supply voltage**  
**Low power**  
**I²C Digital Bus Output**  
**Sleep/Standby mode**  
**Hazardous area certifications**  
**Excellent long-term stability**



## DPS5000 SDI-12

**Pressure Range:** from 700 mbar to 100 bar  
**Accuracy:** +0.1% FS  
**Stainless steel or Titanium construction**  
**Operating Temperature Range:** -40C to 80C  
**Low power**  
**Customer set filter setting**  
**Excellent long-term stability**

# Product selection guide

Please use the guide below to help you locate the ideal product for your application needs.

Natural water monitoring challenges	1800 series	UNIK5000	DPS8000 (TERPS)	DPS5000 I²C	DPS5000 SDI 12
Low power	★	★		★	★
Long service interval	✓	✓	★	✓	✓
Silting	★	✓	✓	✓	✓
Debris	✓	✓	✓	✓	✓
Extreme temperatures		★	★	★	✓
Salt corrosion	★	✓	✓	✓	★
Lightning	★				★
Surface debris and foaming	✓	✓	✓	✓	✓
Narrow bore wells	★	✓	✓	✓	✓
No line of sight	✓	✓	✓	✓	✓
Shallow water	✓	✓		✓	✓
Wide variation of depth	✓	✓	✓	✓	✓
Vandalism	✓	✓	✓	✓	✓

Drinking water monitoring challenges	1800 series	UNIK5000	DPS8000 (TERPS)	DPS5000 I²C	DPS5000 SDI 12
Narrow bore wells	★	✓	✓	✓	✓
Highest accuracy	✓	✓	★	✓	✓
Low power	★	★		★	✓
Long service intervals	✓	✓	★	✓	✓
Subtle changes over long time	✓	✓	★	✓	✓
Media compatibility	★	✓	★	✓	★
Differential measurements		★			

Waste water management challenges	1800 series	UNIK5000	DPS8000 (TERPS)	DPS5000 I²C	DPS5000 SDI 12
Debris	✓	✓	✓	✓	✓
Unknown chemicals	★	✓	✓	✓	★
Low power	★	★		★	✓
Shallow depths	✓	✓		✓	✓
Explosive atmospheres	✓	★		✓	

✓ Options are available to address this challenge  
 ★ This product has a feature specifically designed to address this challenge

Full product datasheets are available from our website: [www.druck.com](http://www.druck.com)  
 For further information and detailed product selection please contact your local Druck representative.

# Global manufacturing excellence

Our pressure solutions are manufactured in the UK, Norway and China to enable us to get closer to our customers. Each facility is ISO9001 accredited and AS9100 for our aerospace business and operates under Druck's strict quality-control procedures. We continue to invest in advanced manufacturing techniques and processes that keep us at the forefront of product quality and efficiency.

## Measurement & sensing

What started as a small business in Leicester, UK in 1972 has now grown into a global pressure-measurement business that is recognised as a world leader in manufacturing high-quality and high-accuracy piezo-resistive pressure sensors. We serve a wide range of applications from Aerospace, Subsea, Test and Calibration and Industrial Applications with customers in over 70 countries. This is due to the fact we process the raw silicon right through to the final product. Over the past 40+ years we have developed world-class expertise in producing high-performance, high-stability, fast-responding and high-quality pressure sensors.

## Brilliant factory

We are proud that our Leicester facility has been named as a Baker Hughes Brilliant Factory, linking data-sources across the factory to enable us to continually improve and control our manufacturing processes.



## State-of-the-art silicon clean room

The heart of all of our pressure sensing solutions is the sensing element, which is manufactured from silicon wafers in our state-of-the-art clean room facility in Leicester, UK. It was completely refurbished in 2015 and is now able to process over 260 versions of silicon 24/7. Advanced robotics have more than tripled the efficiency of the silicon processing, leading to better quality and higher yields.

## Innovation

Druck are leading innovators in pressure sensing and calibration. We are constantly pushing new frontiers and setting new benchmarks in performance. Through our expertise in silicon processing we have developed our Trench Etched Resonant Pressure Sensor (TERPS) technology which delivers unprecedented accuracy and stability. Our customer-focused approach to product development, ensures that we drive to make your life easier and more productive.



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:

[druck.com](https://druck.com)

