

sophisticated pH meters feature a two- or even three-point adjustment via internal algorithms. These are more suitable when precise values are required.

Electrode selection

Nearly all pH meters work with external probes. These can be easily replaced when they are worn out. For some applications, there are special pH electrodes, for example for penetrating soils or meat. If the pH meter has a BNC socket, any other pH electrode with a BNC connector can be used instead of the original probe.

Additional functions of a pH meter

Some pH meters offer additional functions such as storage of the measured data, interfaces for transferring the saved data or the possibility to measure other values as well. Parameters that can be recorded with an appropriately equipped pH meter include, for example, temperature, conductivity, salinity, the TDS content and redox value.

Broad spectrum for different requirements

PCE Instruments offers a wide range of pH meters for many different areas of application. The portfolio includes products from

first-class manufacturers as well as PCE's own test instruments, which benefit from the experience of two decades. The product range extends from devices for individual measurements in swimming pools to devices for continuous measurement in aquariums and professional devices with a memory function and data interface for use in industry, trade and research. PCE Instruments also offers the necessary calibration and storage solutions and special pH electrodes for various applications.

Ludger Droste - PCE Deutschland GmbH

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Pump and Valve Innovator Finds a Test Rig Technology that Talks the Torque

To analyze the long-term performance and reliability of hard working valves and pumps, Bifold Group has adopted radio frequency based torque transducers from Sensor Technology Ltd for two of its specialist test rigs

An inter-generational commitment to advancing science and engineering has seen Bifold transform from a 19th century mining lamp maker into a leading manufacturer of instrument valves and accessories, piping valves and pumps for the oil, gas and wider industrial markets. It has expertise in subsea and wellhead control systems and has also developed market leading technology in areas such as solenoid valves with ultra-low power requirements. By using the power of computer aided design many of Bifold's products are built to custom designs, yet they are produced to very short lead times thanks to the efficiency of internet communications. To maintain this standard, sample products and components are comprehensively tested so that their reliability and capabilities are never in doubt.

Bifold is as innovative in developing its test regimes as it is in advancing its product technologies and business systems. So when it wanted to assess the effects of wear on its long-life valves it set about designing a special test rig. Engineer Andrew Laverick recalls: "We wanted to measure the power required to operate the valve to see how it changed over time and with

long term use. It was clear that the best way to do this was to measure the torque input over an extended period."

"We were open to any design concept for the test rig, but soon found ourselves gravitating towards a TorqSense solution because the Sensor Technology engineers were so helpful and really knowledgeable about test rigs."

TorqSense transducers lend themselves to test rig uses because they are non-contact measuring devices. Attached to the surface of the transducer shaft are two Surface Acoustic Wave (SAW) devices, when torque is applied to the shaft the SAWs react to the applied strain and change their output. The SAW devices are interrogated wirelessly using an RF couple, which passes the SAW data to and from the electronics inside the body of the transducer. Sensor Technology's Mark Ingham explains: "All you have to do is set up a TorqSense transducer in the test rig and fire it up. The SAW frequencies reflected back are distorted in proportion to the twist in the test piece, which in turn is proportional to the level of torque. We have some clever electronics to analyse the



returning wave and feed out torque values to a computer screen."

"TorqSense has been used on many test rigs over the years and I was delighted to hear the Bifold engineers say how easy it is to use and how robust the software is."

Laverick again: "As a test engineer you are almost resigned to long set up procedures and software that falls over at the drop of a hat. But Sensor Technology has designed these problems out of their TorqSense equipment, with the result that we were able to complete our long-term test procedures with the minimum amount of fuss and heartache and well within the allotted time schedule."

In fact Bifold has since bought a second TorqSense which is being fitted to a new test rig used to assess the performance of mission critical chemical injection pumps, as used at oil and gas wellheads and on process pipelines.

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