

and fields of application. This is particularly the case with magnetic rotary sensors. Completely contact-free rotary sensors can be implemented with

external magnets attached by the customer. In addition, non-ferromagnetic material can even be interposed between the externally rotating

magnet and the rotary sensor – further increasing the degree of versatility – by, for example, allowing the rotating magnet to be operated where there are higher temperatures or pressures than completely encapsulated analytical electronic systems.

In the case of optical encoders, individual subassemblies are available which can be integrated into applications, but these are much more susceptible to faults, since the glass, plastic or metal discs have to be installed by the customer with a high level of precision. Contamination and other media can also interfere with proper operation.

To make the installation of magnetic sensors as simple as possible, various types of magnet supports are available, with a range of attachment options. It must be noted, however, that the installation accuracy required by manufacturers is of paramount importance in achieving the specified measurement precision and must therefore also be taken into account when evaluating the different systems. Vert-X rotary sensors, for example, are now available which permit installation tolerances of up to $\pm 0.05\text{mm}$ (0.5mm xx,yy) and $\pm 1\text{mm}$ (zz).

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A non-contact solution to testing

Realising there was a need for a service which encompassed all aspects of test rig design and build, 1st Pass, a systems integrator of National Instruments LabVIEW software packages, decided to offer the full package. It would interview the engineers to establish likely future requirements, then design and build a test rig or station that would address these. This includes electrical and mechanical design, software, firmware, support systems etc., as well as the installation, calibration and maintenance of the rigs.

So when the company was asked to assess the needs for life testing electric motors for one manufacturer, it was decided that eight rigs were required. These were to be based on the concept of the test motors driving against a brake, with dynamic performance data collected from around the rig and analysed using LabVIEW.

Explaining the requirements, MD Chris Turner said: "We needed to be able to calibrate and recalibrate the rigs on a regular basis, and we wanted the calibration process to be as simple as possible. I was able to use a TorqSense (from Sensor Technology) with an RS232 output for this – a sensor that can monitor the torque in a rotating shaft without actually touching it – as it opened up the potential for foolproof, robust yet sensitive, calibration."

It was initially assumed that each rig would have its own on-board calibration unit, but Turner began to think about developing a demountable unit that could be shared around all the rigs.

TorqSense's non-contact operation and lack of flying leads make demountable installations a possibility, so Turner knew he had to come up with a way of achieving accuracy of the transducer's positioning. Working with Sensor Technology, it was decided the best solution would be sliding the TorqSense unit up against end stops.

Turner adds: "To do this we had to find a way to move the brake away from the motor so that we had room to slip the calibrator in. It was fairly obvious to mount the brakes on a slide too: this was a simple solution that required little re-designing of our original concept."



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pressure sensors

Industrial high spec. / small size pressure transmitter Series 21PY

This is a miniature 15mm diameter / weight 18g pressure transmitter that has exceptional performance. By using new automated compensation techniques, Keller has created a product that could only be dreamed of a few years earlier. The 21PY offers pressure ranges from 0...10bar through to 0...600bar, with signal 0.5V...4.5V / supply 8...28Vdc. Temperature errors are virtually eliminated by electronic compensation, to give a Total Error Band of $\pm 1\%$ over 0...50°C or $\pm 1.5\%$ over -10...80°C (Premium grade $\pm 0.5\%$ & $\pm 0.7\%$ option, at extra cost). New electronics give very high levels of EMC protection, designed to exceed the new EN 61000-6-2:2005 / EN 61000-6-3:2007 / EN 61326-2-3: 2006. Utilising modern welding techniques, this all welded 316L stainless steel design is ideal for applications such as; Autosport, Hydraulics, Test Rigs and other deployment where size $\varnothing 15\text{mm}$ and weight of just 18g are critical.

Industrial high spec. pressure transmitter Series 21Y

The Series 21Y pressure transducer / transmitter is designed for general industrial and OEM applications requiring medium to high measurement accuracy. Its high design flexibility affords numerous options of process and electrical connection. Pressure ranges between 0...2 and 0...1000 bar are available with output signal options of 4-20mA, 0-10V and 0.5-4.5V. The Series 21Y employs active temperature compensation to significantly reduce total error band and has extremely high EMC protection for a transmitter of this class / price point. Total error band including linearity and all thermal errors over 0...50 deg C is $\leq \pm 1\%$ FS max.

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