

The Torque Sensor Do's & Don'ts Guide

Throughout our two decade existence, we've had the opportunity to work on a great number of Torque Sensor applications for both reaction and rotary type sensors. Throughout this time we've also seen incredibly bright engineers make incredibly unwise decisions when implementing their sensor systems. So we hope that with these guidelines, engineers and technicians can learn and avoid some of the common mistakes made.

General Comments

Your sensor package should have included a Calibration Certificate. This is a very important document detailing the calibration data unique to your sensor. If you lose it, you may access it online here: [Calibration Certificates](#)

We've provided a good outline on the variables you should consider when [Selecting a Torque Sensor](#), and we can't emphasize enough that selecting the right capacity is also very important. [How to Select A Torque Sensor Guide](#)

All FUTEK models have specifications sheets located on www.futek.com where complete specifications are detailed. Critical information such as the Sensors Wiring Code is located on this sheet. You can access this 24/7 online.

Proper care of your Torque Sensor

Similar to our Load Cells, Torque Sensors are also extremely sensitive when applying force during your application. Thus, proper handling and installation will be essential in order to get the most accurate outputs. Here are some useful tips to consider:

Reaction & Rotary Torque Sensors

Selecting the right type of application for your reaction type Torque Sensor is very critical. Reaction Torque Sensors do not rotate, they can only be used up to 360 degrees of rotation without having the cable to begin wrapping around the body. If your application requires more than one revolution or measurement of speed, this would require our Rotary Torque Sensor.

If choosing a Rotary Torque Sensor, make sure you follow the basic guidelines.

- Ensure you do not go over the maximum indicated RPM speed.
- If the sensor is a slip ring version make sure to have the sensor serviced after 10^6 revolutions.
- Use stable power supply to prevent high voltage surges.

For some OEM type sensors, the components of the sensor may be exposed. Make sure you do not touch or handle these surfaces.

Mounting / Installation

The Mounting/Installation of the sensor presents plenty of opportunities where potential mistakes can be made. Here are some useful tips to consider:

Before installing your sensor connect the sensor to the related instrument and let the sensor provide feedback on how it is being mounted. If a large zero change is witnessed then there could be several issues with the mounting configuration, which common issues are listed below.

- Use flat, parallel and clean mounting surfaces. A dirty environment or an uneven surface can easily distort your data.

- When installing, do not bolt to maximum torque instantly. This can damage the sensor. Always use a star pattern when tightening and bolt slowly using 20, 40, 60, 80, 100% method. (the same technique that is used when bolting your tires).
- For misalignment use flexible couplings; this will help to minimize error. Maintain inline torque when used without a coupling or flexible joint
- Use the sensor pilot diameters to concentrically align fixtures.
- Make sure your application will not exceed the overhang or axial max forces indicated on the datasheet

Overloading

One of the most common mistakes that occurs is Overloading of a sensor. This is particularly an issue for low capacity sensors. When you are working with a low capacity sensor, you must take the utmost caution during handling and installation to make sure the sensor is not damaged. Here are some common tips.

- It is especially important with Reaction Torque Sensors to not off center load them.
- Select a sensor capacity higher than what you are measuring. This will allow for additional cushion incase your actual torque measurements are higher than what you predicted.
- Ensure the system can not be dynamically loaded beyond the response of the instrument and sensor. Spike loads can occur without the instrument being able to catch them.
- If you think the Torque Sensor was overloaded, check the zero and compare it to the original zero. If there is significant change contact FUTEK for further evaluation.

Connection & Cable

The Torque Sensor cable can also pose challenges to some applications so please consider the following:

- Do not pull or yank on the Torque Sensor cable.
- Pinching and flexing the cable may cause damage, especially if it's left in such a position for extended periods.
- When using a reaction sensor make sure the cable is positioned on the rigid mounting side and not on the active measurement side. The cable could lead to inaccurate measurement.
- When installing a sensor in a wet or moist environment ensure the cable has a drip loop to allow moisture to run away from the connection area.
- The Torque Sensor spec sheet addresses the wiring code so refer to it if you are uncertain.