Torque Transducers

Kyowa’s torque transducers convert torsion (surface shearing stress) corresponding to a torque of the shaft to an electric quantity (Voltage), and then output signals through slip ring, brush, rotary transformer and photo transmittance. They ensure accurate and easy measurement of the torque transmitted from the target object under conditions of standstill to high-speed rotation. Since all these transducers use strain gages for the sensing element, precise and stable measurement is assured even for long-term operation under severe conditions. Thus, they are widely used not only for experiments and research but also for industrial measurement.

Kyowa’s torque transducers are designed for use in combination with strain amplifiers. Kyowa’s recorder/analyzer enables simultaneous measurement of torque and other variables such as temperature.

Features

- Stable torque measurement under various conditions from stop to high-speed rotation
- Little impact from shaft bending or sliding, enabling high accuracy torque measurements

To Ensure Safe Usage

Kyowa's torque transducers are designed to detect torsional deformation of a metal shaft by using a strain gage. Torque is measured on a shaft placed between a motor and a load. If torque exceeding the rated capacity is applied to the torque transducer, a shaft will be deformed plastically and then be destructed. Also, if overload torque continues to be applied, this results in fatigue destruction of shaft.

In TP series, shafts are covered with metal case which prevents scattering broken pieces by destruction, but make sure to take countermeasures.

(1) Kyowa’s torque transducers are designed to transmit torsional torque. Make sure that the end of the shaft does not receive any radial or thrust load. Loads except torsional load may cause destruction of a shaft by applying excessive stress.

(2) For TP series torque transducers, use a flexible coupling. Rigid flange coupling causes a shaft excessive stress leading to worsen performance and destruction.

(3) If the load has a high inertia and the motor rotation rises up quickly, the transducer may momentarily be loaded with a large torque. Make sure to choose a suitable torque transducer which has enough rated capacity.

(4) In dynamic torque measurement, pay attention to a natural frequency of a torsion which depends on relationships among both inertias of a motor and a load and a torsional rigidity of a torque transducer. Also, avoid rotating a shaft at a speed (rpm) approaching a natural frequency of a measurement system.
**Block diagram of measurement system of TPS torque transducers**

TPS Torque Transducer TPS-A

Voltage output ±5V

Indicator

A/D converter

PC

**Flexible couplings dedicated to TP-D/E/M**

- **FC-1B, Single Type**
  - (For use where there is no eccentricity but only declination)
- **FC-2B, Double Type**
  - (For use where there are both eccentricity and declination)

**Method how to install TP torque transducer**

- **To measure load torque**
- **To measure motor torque**

Mounting bolts are not included as accessories of the transducer.