

TTC –Torque Sensor

Description

TTC - Telemetric-TorqControl[®] Sensor Technology - is an extremely robust and reliable torque measuring system for permanent industrial use.

A TTC torque sensor is mounted on existing shafts. No modifications to drive trains are necessary. TTC sensors are based on strain gauge technology to measure the torque proportional to the torsion of a shaft. The use of a telemetric system guaranties a contact-free operation. ACIDA specialises in providing this measuring technology for high to extremely high torque loads under the harshest industrial operating conditions, e.g. rolling mills, vessel propeller shafts, roller presses, hauling engines in mining industry.

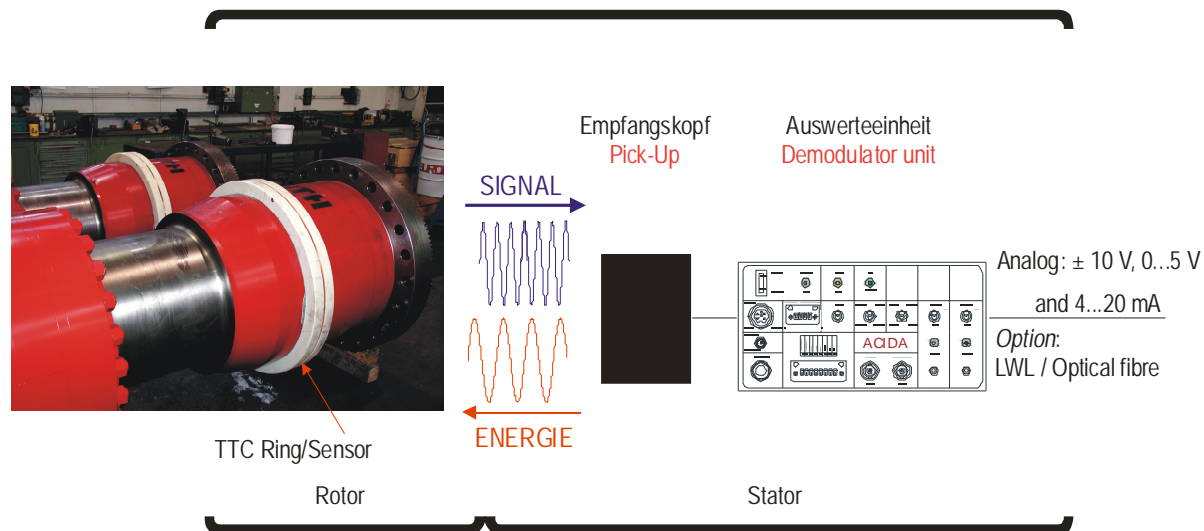
A TTC transducer consists of a ring mounted on the rotating shaft. The ring supports and protects the rotating system modules. The key function of the ring and the sophisticated sealing system is, however, to protect the strain gauge mounted on the shaft. Only the TTC-rings from ACIDA provide hermetically enclosed strain gauges without

altering the torsional stiffness of the shaft. TTC comprises a 1-channel telemetry system with contact-free signal transmission and inductive power supply. The rotor electronics are mounted on the shaft within the TTC ring. The static components are a pick-up, which receives the torque signal from the ring antenna, and the demodulator which provides the $\pm 10V$, $0...5V$ or $4...20mA$ analogue torque signal.

Besides the standard type, an additional metal ring offers even higher sensor protection, i.e. the metal ring acts as an extra strain gauge safeguard. Moreover an extra protective housing for the pick-up and an armoured protective tube for the cabling is available for rough environment applications. Other options are special designs which allow the installation at axially shifting shafts.

TTC is exclusively offered and delivered as a turn-key system, i.e. it includes the system components, the installation of the strain gauges by our specialists, mounting and sealing of the system and commissioning.

TTC - Telemetric TorqControl[®] Drehmomentmeßtechnik
TTC - TorqControl[®] Sensor Technology



pic. 1 TTC torque sensor application schematic view of the signal transmission and system components

Technical specifications of TTC sensors:

- Product reference is TTC-4.5
- Shaft diameters 100...1500 mm (4...60 inch)
- Strain gauge is hot-bonded onto the shaft
- PA antenna and system protective ring with integrated oscillator for telemetry system (rotor)
- Pick-up for contact-free system operation (mounted at 5...40 mm / 0.2...1.5 inches from the rotor)
- Demodulator (Stator-electronics) with signal conditioning in a DIN-rail housing
- Up to 30 m / 98 ft. special cable between pick-up and demodulator
- Signal output: analogue $\pm 10V$, 0...5V or 4 ... 20 mA at the demodulator
- Signal dynamics: 100 or 1000 Hz adjustable
- Integrated low-pass filter: 2-pole Butterworth
- Temperature range: 0...75 °C / 32...167 ° F
- Power supply: 24V DC
- Documentation in English, German or French on CD-ROM in the PDF-Format
- Training

Other torque sensors models on TTC technology

- TTC AXIAL.1
Torque sensor with an axial telemetry for permanent industrial use at rotating shafts, consisting of strain gauges, a one channel telemetry system, which is mounted at a free shaft end (!) for contact-free signal transmission and inductive energy supply.
- TTC-STATIC.1
Torque sensors for non-rotating applications and apart from the fact that no telemetry system is used, it is technically identical to the TTC sensors.
- ITC.1
ITC sensors use the TTC sensor technology, but additionally the ITC-type includes the drive component. Thus ACIDA delivers *intelligent* cardan shafts, compensating couplings or flexible couplings with *Integrated* TTC torque. The mounting and commissioning of the sensors can thus be completed by the end-user.

Installation and Commissioning Service

- The turnkey installation and commissioning is part of each TTC sensor and is charged as an extra on a time basis according to our hourly rates.
The service includes the strain gauges application, mounting of the antenna, protection ring, pick-up and demodulator.

Required support

- Shutdown, accessibility to the drive shaft for the duration of the torque sensor installation (approx. 10 hours)
- Technical data of the drive: shaft diameter (outer and inner), material specification (Young's Modulus and Poisson Ratio) and torque range (including dynamic torque overload potential)

TTC-specific options

- TTC-ALU.4
Metal protective ring for the strain gauge. The rings may be designed for axially offset or concentric mounting.
- TTC-O-PROT4.1
Water and oil-resistant housing for the pick-up (IP65) and 10 m / 30 ft. protective tube for the cabling between the pick-up and the demodulator
- SPEED.2
Rev-meter / rotational speed signal output
- TTC-O-BEND.1
Bending compensation
- TTC-O-TEMP.1
Extended temperature range: -10...120°C / 17...250°F
- TTC-O-SHIFT.1
Electronic compensation of axially shifting shafts

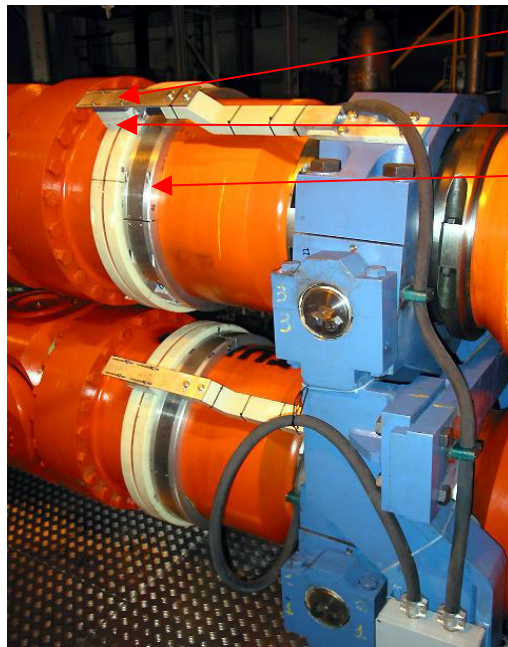
Apply for this datasheet our general business conditions:

- General conditions for industrial applications
- General conditions for service and delivery
- Hourly- and daily rates

The general conditions and other documents can be downloaded from our website: www.acida.net

More information: info@acida.net

Technical data and images can be modified at any time.



Stator: Signal receiver and inductive power supply

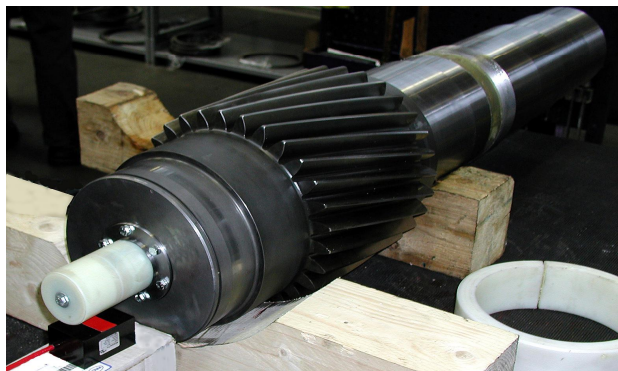
Air gap: 5 ... 50 mm

Rotor: strain gauge, rotor electronics,

TTC torque sensor with the options of a second protection ring, and pick-up protection)



Special version of TTC with enlarged energy supply for axially shifting drive shafts (option TTC -SHIFT.1)



Special version of TTC with axial signal transmission and power supply (TTC -AXIAL.1)

