TF SERIES | TORQUE FLANGE SENSOR
QUICK START MANUAL

SAFETY PRECAUTIONS

WARNING WARNING! IN ORDER TO MINIMIZE RISKS, IT IS OF UTMOST IMPORTANCE TO RESPECT THE CURRENT SAFETY STANDARDS WHEN PLANNING, CONFIGURING AND OPERATING THE TORQUE MEASUREMENT DRIVE TRAIN.

CAUTION CAUTION: OPERATE THE TF SERIES TORQUE FLANGE SENSOR WITH GREAT CAUTION! THE SENSOR MAY BE IRREVERSIBLY DAMAGED IF IMPACTED MECHANICALLY (FALL), CHEMICALLY (ACIDS) OR THERMALLY (HOT AIR, VAPOR).

NOTICE If any points in this guide are not clear refer to the complete user manual included with the TF Torque Flange Sensor or available online on our website www.magtrol.com.

1. Make sure that all Magtrol electronic products are earth-grounded, to guarantee personal safety and proper operation.
2. Check line voltage before operating electronic equipment.
3. Make sure that all rotating parts are equipped with appropriate safety guards.
4. Periodically check all connections and attachments.
5. Always wear protective glasses when working close to rotating elements.
6. Never wear a necktie or baggy clothes when standing close to rotating elements.
7. Never stand too close or bend over the rotating drive chain.

QUALIFIED PERSONNEL

Persons in charge of installing and operating the TF Series Torque Flange Sensor must have read and understood this user manual, paying extra close attention to all safety-related information.

The TF Series Torque Flange Sensor is a high-precision product integrating the most recent measurement techniques. The sensor can give rise to residual dangers if used and manipulated in a non-compliant way by unqualified personnel. This sensor must be handled by qualified personnel according to the technical requirements and the above-mentioned safety instructions. This is also true when using torque sensor accessories.

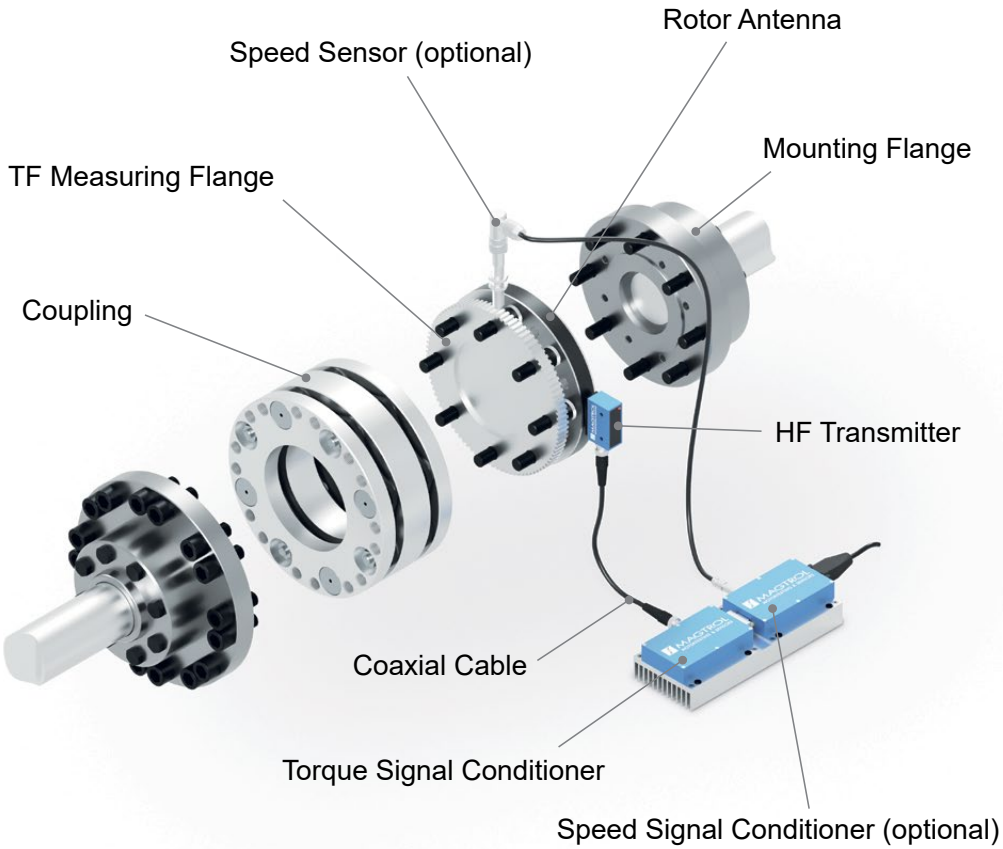
PROPER USE

The use of TF Series Torque Flange Sensors is exclusively restricted to torque and rotational speed measuring tasks and directly-related control and regulating tasks. Any further use shall be deemed to be improper.

For safe operation, the TF Sensor and its accessories may only be used according to the data and specifications given in this User's Manual. Safe operation can be guaranteed only when the sensor is correctly transported, stored, installed, mounted and used.

The TF Series Torque Flange Sensor and its accessories may not be modified without the express consent of Magtrol. Magtrol is not be liable for any consequential damages resulting from unauthorized modifications.

OVERVIEW OF MEASURMENT SYSTEM



System configuration overview

The telemetry system will not work properly if the size of the mounting flange is too big or if the HF Transmitter vibrates too much.

Please download the whole manual on our website www.magtrol.com and refere to the section "Mounting Considerations" for further information.

NOTICE Before completing the assembly and mounting. It is advised to first power up the system (see Section 3.1 of the TF Series user manual) in order to check the signal transmission.

The torque signal conditioner supplies power to the measuring flange, via the HF transmitter, and collects the torque signal measured by the system. Depending of the model, the conditioner may be 1.5 W (TF 309 ... TF 317) or 5 W (TF 318 ... TF 320). To display measured values, the conditioner must be connected to a MODEL 3411 Torque Display from Magtrolor similar device.

Signal Conditioner 1.5 W

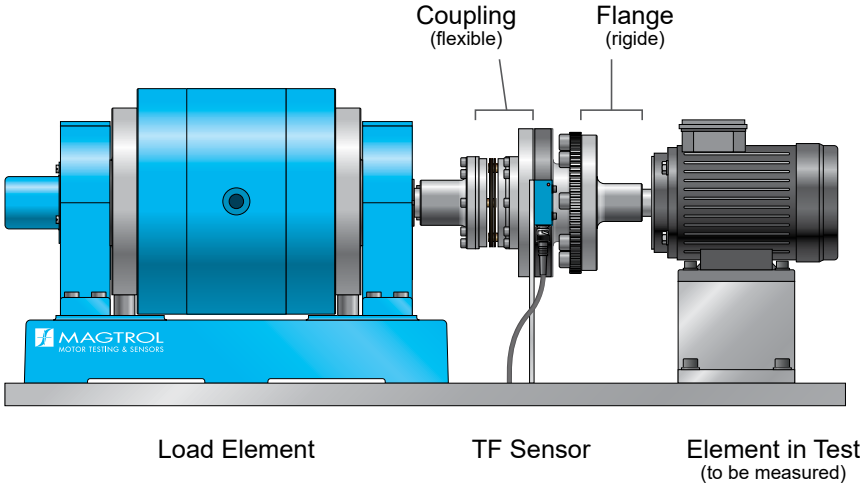
Signal Conditioner 5 W

MODEL 3411 Torque Display

ALIGNMENT CONSIDERATION

MOUNTING DIRECTION

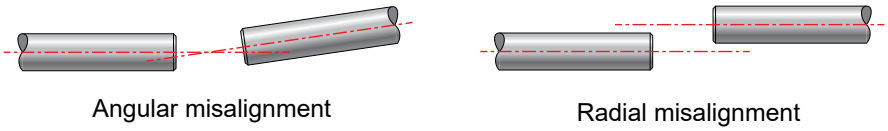
Magtrol strongly recommends that the flexible coupling be mounted on the opposite side of the element to be measured. If the mounting cannot be done according to the above recommendations, proceed to the best of your ability. Magtrol Torque Flange work perfectly in all configurations, however, mounting as recommended below can improve the quality of the measurement.



Recommanded Mounting direction

ALIGNMENT

It is important to achieve the best possible alignment of the various components of the measurement drive train. Angular and radial misalignments must be avoided.

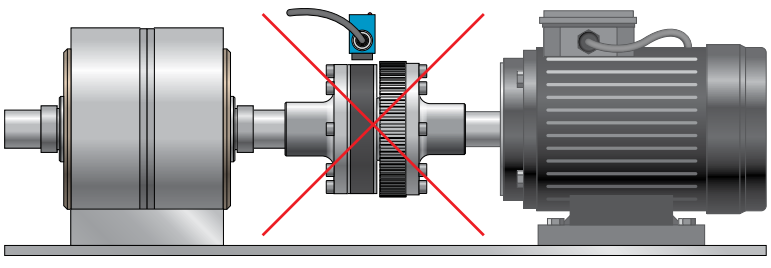


Angular and Radial Misalignment

The admissible angular and radial misalignment is 0.3° and 0.04 mm, respectively. By using proper couplings, modest misalignments can be compensated.

COUPLING SELECTION

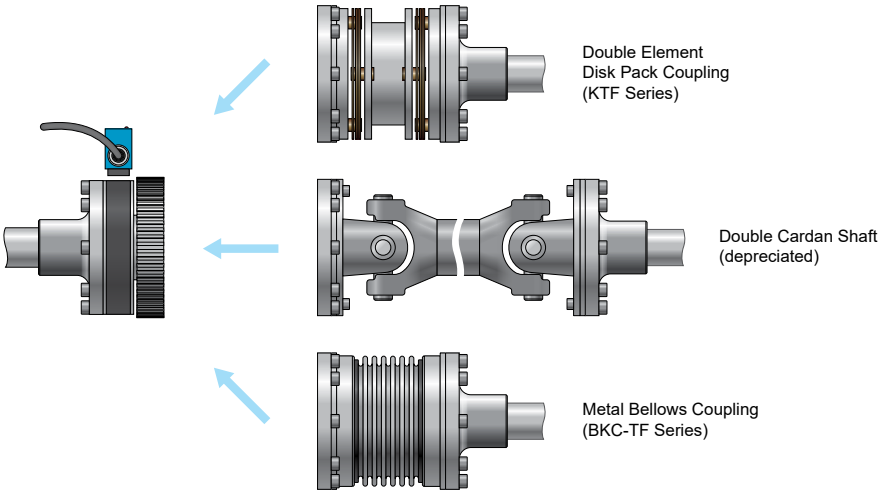
To avoid excessive extraneous loads, do not couple the driving elements directly to the driven part of the measuring chain by means of the measuring flange. A coupling is necessary.



Incorrect (rigid mounting)

COUPLINGS FOR MISALIGNMENT

If the shaft mounting shows a slight radial misalignment, a two-piece lamella coupling, double cardan shaft or bellows coupling may be used. These elements provide the system with two degrees of freedom in order to compensate for a slight radial misalignment.



Coupling Options for Radial Misalignment Correction

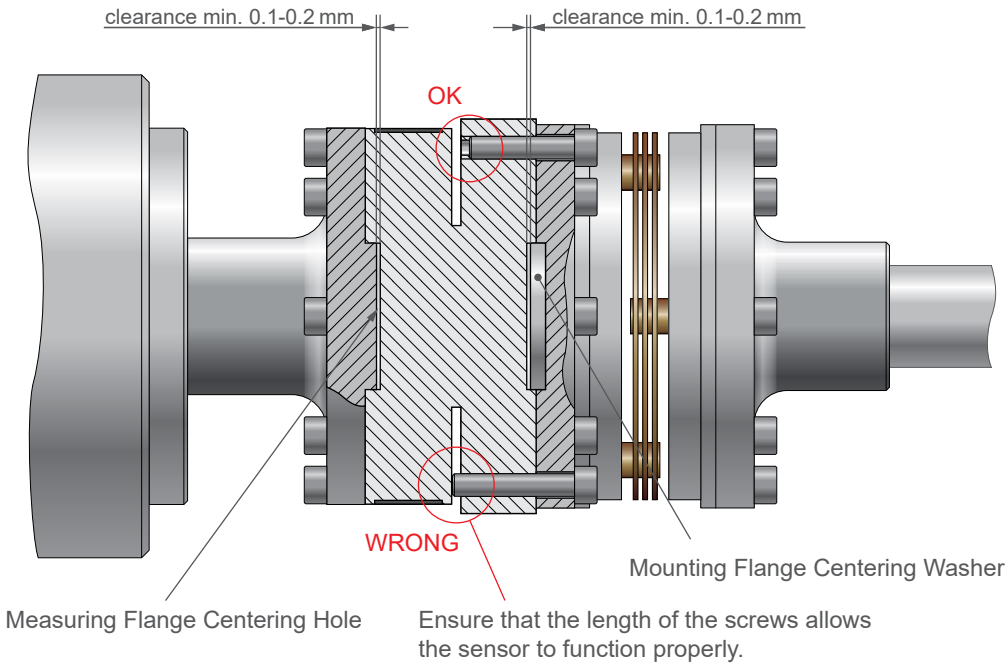
CAUTION PLEASE CHECK THE MAXIMUM SPEED CAPACITY OF THE COUPLINGS. A STANDARD BALANCING CARDAN SHAFT IS FOR A MAXIMUM SPEED OF 2000 RPM

CENTERING THE SENSOR

The use of centering washer or centering hole is mandatory !!

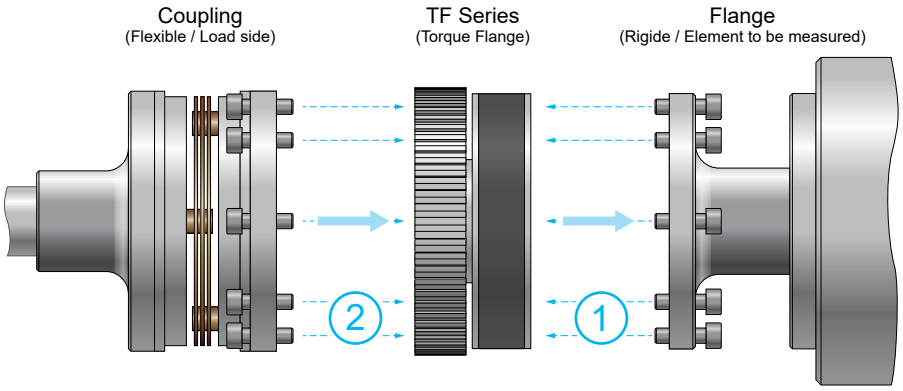
Check the lengths of the screws and be sure to avoid any contact between the screws and the opposite part of the measuring flange.

Contact between the screws and the measuring flange will damage the TF.

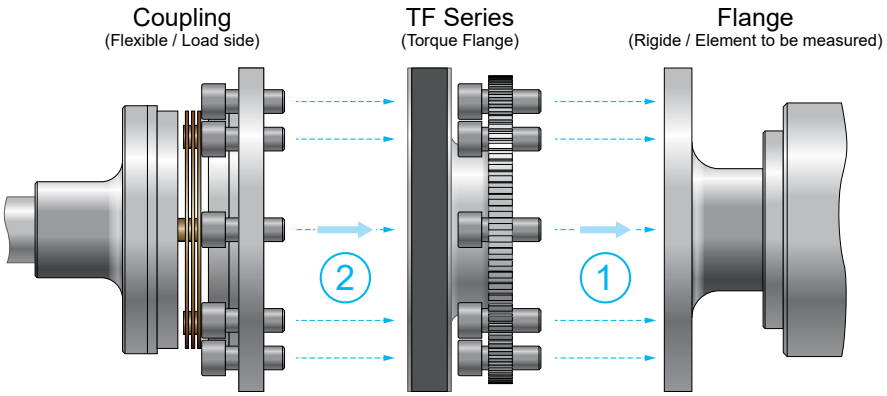


MOUNTING TF SERIES TORQUE FLANGE

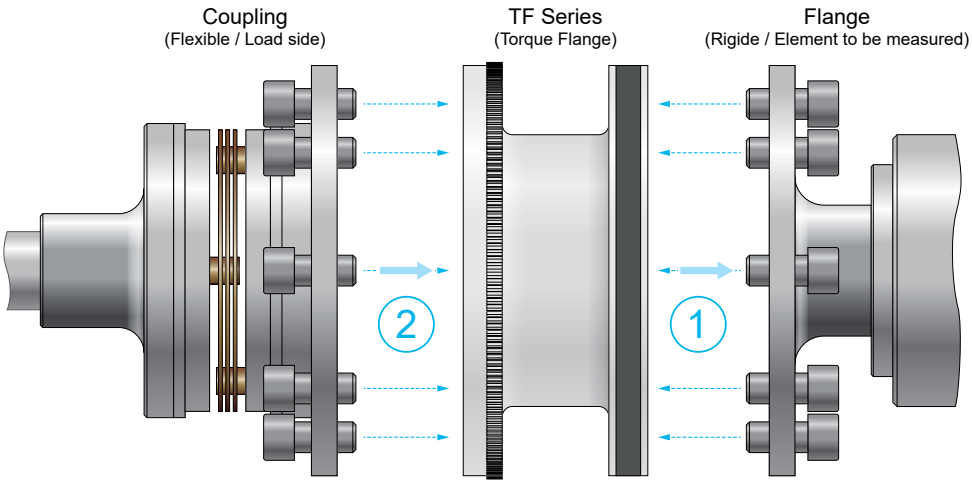
MOUNTING TF 309 - TF 312



MOUNTING TF 313 - TF 317



MOUNTING TF 318 - TF 320



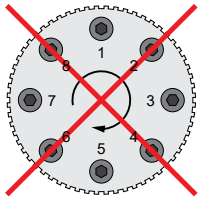
Important parameters on the drive train:

- Use only components that are well balanced.
- Check the speed capacity for any elements mounted on the train (cardan shaft i.e.)
- Check the alignment and run-out before running.
- Reduce the vibration level as much as possible

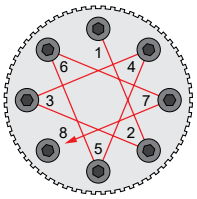
MOUNTING SCREWS

The measuring flange must be mounted with 8.8/10.9/12.9 quality screws applying the specific fastening torque listed in the following table. The mounting order of the screws must be tightened according diagram below.

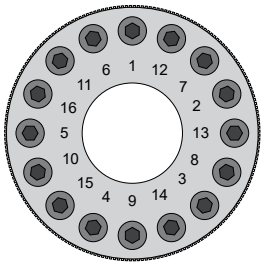
MODEL	FASTENING SCREW SIZE	SCREW CLASS	FASTENING TORQUE [N·m] Friction Coefficient μ = 0.12
TF 309	M6	8.8	10.1
TF 310			
TF 311	M6	10.9	14.9
TF 312			
TF 313	M10	10.9	71.0
TF 314			
TF 315	M12	10.9	123.0
TF 316	M14	12.9	229.0
TF 317	M16	12.9	354.0
TF 318	M30	10.9	2033.0
TF 319		12.9	2380.0
TF 320			



Wrong



8 Screws Version



16 Screws Version

NOTICE When faced with alternating loads, secure the screws in their threads with thread locker in order to avoid any loss of preload. Be sure to prevent the thread locker from spilling over.

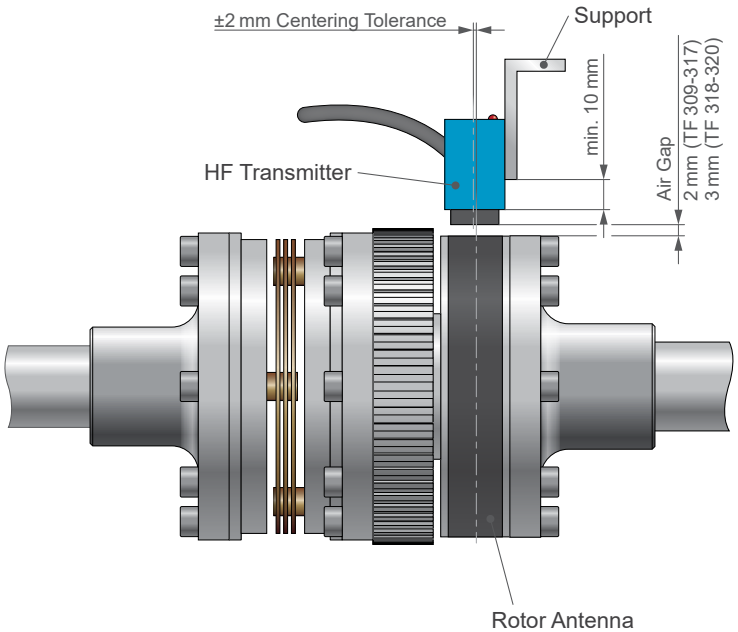
HF TRANSMITTER MOUNTING

The HF transmitter must be perfectly centered (laterally) with the rotor antenna and also aligned with the measuring flange axis.

A gap of 2 mm (TF 309 ... TF 317) and 3 mm (TF 318 ... TF 320) must be maintained between the HF transmitter and rotor antenna in order to guarantee the best possible signal transmission.

For more information about mounting the HF Transmitter, please read the complete user manual.

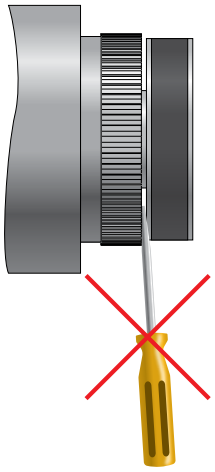
You can download it freely on our website www.magtrol.com



DISMOUNTING THE MEASURING FLANGE

When dismounting the measuring flange from the drive train, make sure that all mounting screws are removed including those which are not visible from outside.

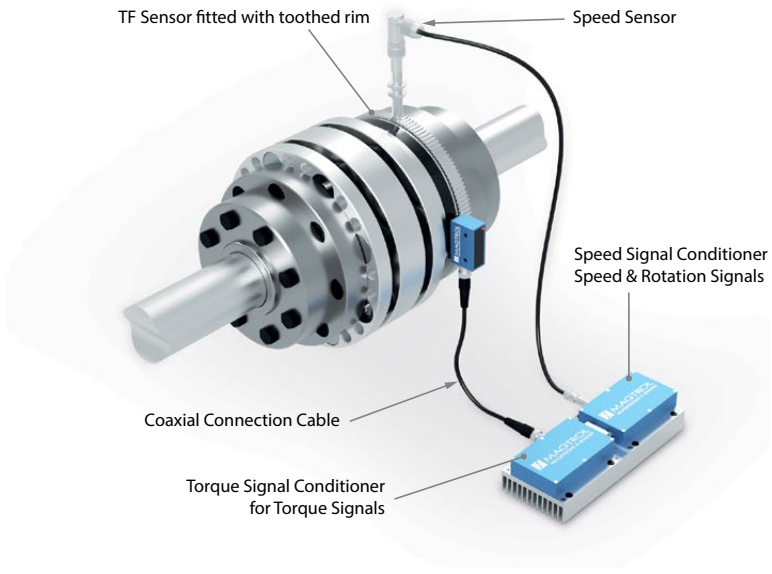
CAUTION NEVER USE THE MEASURING FLANGE FOR LEVERAGE WHEN DISMOUNTING THE SENSOR.



WIRING CONNECTION

CAUTION NEVER SHORTER NOR REPLACE THE HF TRANSMITTER CABLE (COAXIAL CABLE)

TF Series Torque flange sensor is delivered with à 4 meter HF cable. This cable should not be shorter nor replaces by equivalent one as this will alterate sensor calibration and functioning.



The shielded RG-58 coaxial cable between the HF transmitter and the conditioner has an impedance of 50Ω and is 4 meters lenght (other lenght, 8m, 12m, 16m and 20m cables are available on request).

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