

# Production Line Overview

Standard measuring telemetry for test, development, research



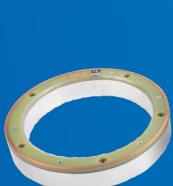
Customer specific torque / Transducer / OEM series



Standard torque transducers for test rigs



Special industry solutions & applications (e.g. Automotive, Aircraft)



Turbine/Turbo charger telemetry



Radio telemetry



Precision calibration for torque (10 N·m - 500 kN·m)  
and force calibrations (1 N - 100 kN)

Our calibration services for our products  
as well third party products



Torque calibrations according to  
DAkkS  
as well as factory calibrations  
and special calibrations

MANNER Sensortelemetrie has established a state-of-the-art calibration laboratory that offers a wide range of torque calibrations. The calibration laboratory is accredited according to DIN EN ISO/IEC 17025:2018 and offers DAkkS calibrations according to DIN 51309 and factory calibrations based on DIN EN ISO 10012. This is the logical step in the expansion of the torque division.

From miniature transducers to 500 kN·m ship flanges, all customer requirements can be covered directly at the company headquarters. A crane runway with a load capacity of up to 4 tons enables professional and efficient handling of large transducers.

EXPANDED UNCERTAINTY		
MEASUREMENT	RANGE	MEASUREMENT UNCERTAINTY
Torque (DAkkS calibration-available)	10 N·m - 100 N·m	0,2 % (only factory calibrations)
	100 N·m - 20 kN·m	0,04 %
	> 20 kN·m - 500 kN·m	0,1 %
Force (factory calibration)	1 N - 100 kN	0,2 % (only factory calibrations)

The MANNER calibration laboratory supports of course all common analogue and digital output signal to enable the calibration of your complete measurement chain.

MANNER Sensortelemetrie has created a new dimension of quality through replicability due the brand-new automated process of torque calibration. This results in the demand for high-quality, yet cost-effective calibrations with short delivery times for a wide variety of torque transducers such as gear shafts, side shafts, flexplates or measuring flanges for test bench applications - as initial or recalibration also from MANNER brand as well as from others.

LEAD TIMES FOR YOUR CALIBRATION		
MEASURED VARIABLE	THROUGHPUT TIME	ACCLIMATISATION TIME*
10 N·m - 5 kN·m	6 working days	+ 1 day
5 kN·m - 50 kN·m	8,5 working days	+ 1,5 days
50 kN·m - 500 kN·m	10 working days	+ 3 days
		(*only for DAkkS-calibrations)

## FURTHER SERVICE

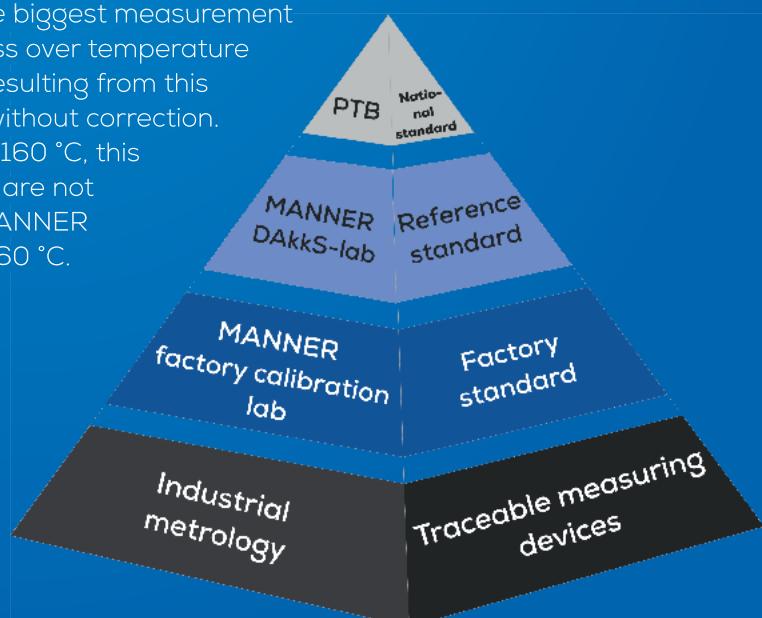
### Temperature Calibration – your way to precise measurement:

When measuring not at a temperature of 23 °C, the biggest measurement failure results from the deviation of material stiffness over temperature (elasticity module). The measured value deviation resulting from this effect is approx. 2,5 %/100 K temperature change without correction.

Over a common temperature range from -40 °C to 160 °C, this deviation can cumulate up to 5 %. These deviations are not linear and cannot be calculated easily. Therefore, MANNER offers temperature calibrations from -40 °C up to 160 °C. A linearity deviation of < 0,05 % over the entire temperature range is possible.

### Force calibration

For customers with force calibration MANNER provides two test benches. This service can be used for pure force sensors but also multi-force load sensors (torque and axial force) can be calibrated as full



# Our torque calibration facilities



## 100 N·m system

### Expanded uncertainty: 0,2 %

System for miniature transducers (e.g. spindles or turbochargers) with calibration ranges between 10 N·m and 100 N·m.

## 1 kN·m system

### Expanded uncertainty:

0,04 % > 100 N·m

System for customer-specific transducers (e.g. pulleys or measuring sensors) with a calibration range of up to 1 kN·m.



## 5 kN·m system

### Expanded uncertainty:

0,04 % > 500 N·m

Two systems for a wide range of applications: transducers, passenger car side shafts, transmission flanges or distributor shafts for aircraft landing flap systems. Due to the variable adjustment of the length, both short flanges and transducers with lengths of up to 3 m can be calibrated.

## 50 kN·m system

### Expanded uncertainty:

0,04 % < 2 kN·m / 0,2% > 20 kN·m

Vertical calibration system, mainly for applications in the truck and heavy machinery industry. The generous installation space also allows calibrations of bulky special transducers.



## 500 kN·m system

### Expanded uncertainty:

0,1 % > 20 kN·m

System for standard torque transducers and special transducers in the field of shipping, large gears or wind power plants. These transducers can be manufactured and/or calibrated at MANNER.

