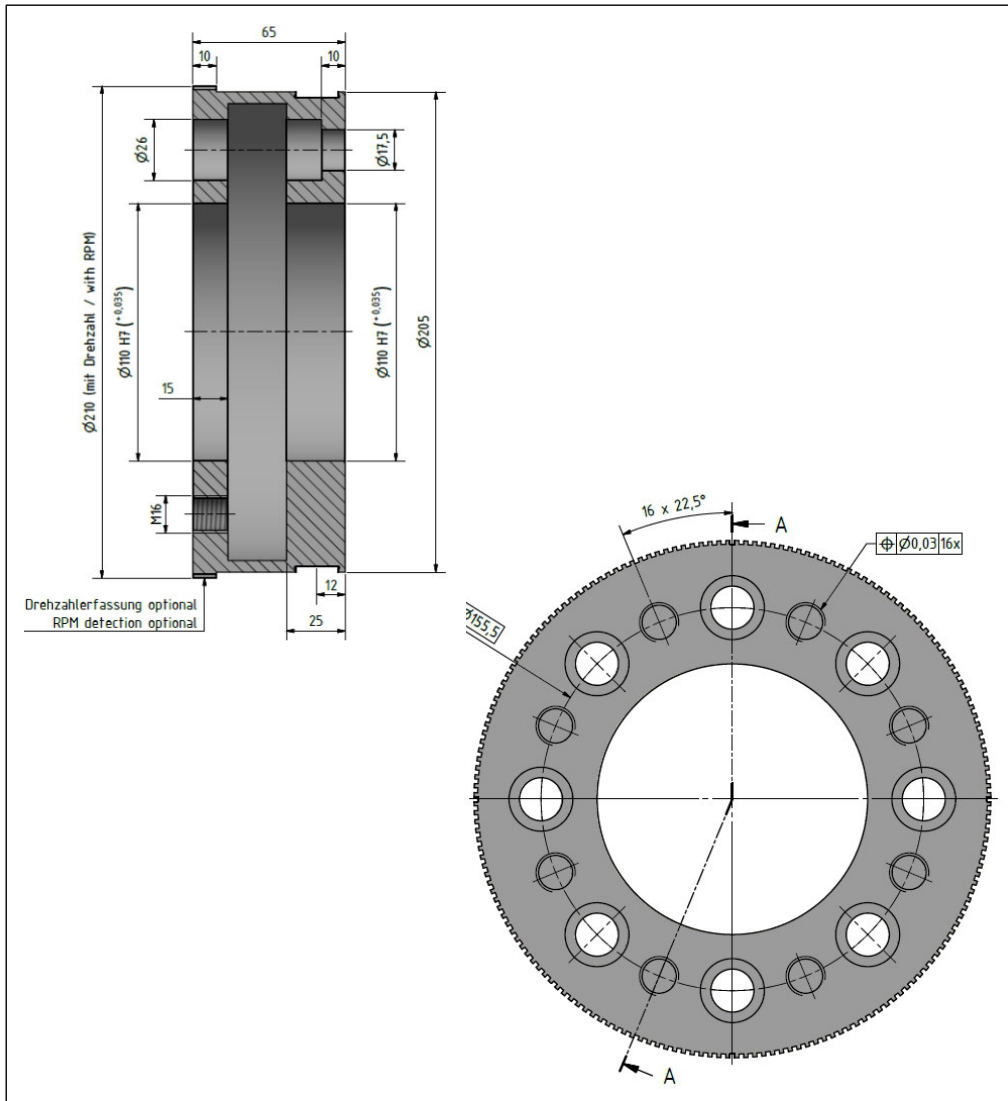


# Torque transducer with high bending stiffness

measuring range: 5, 10 kN·m

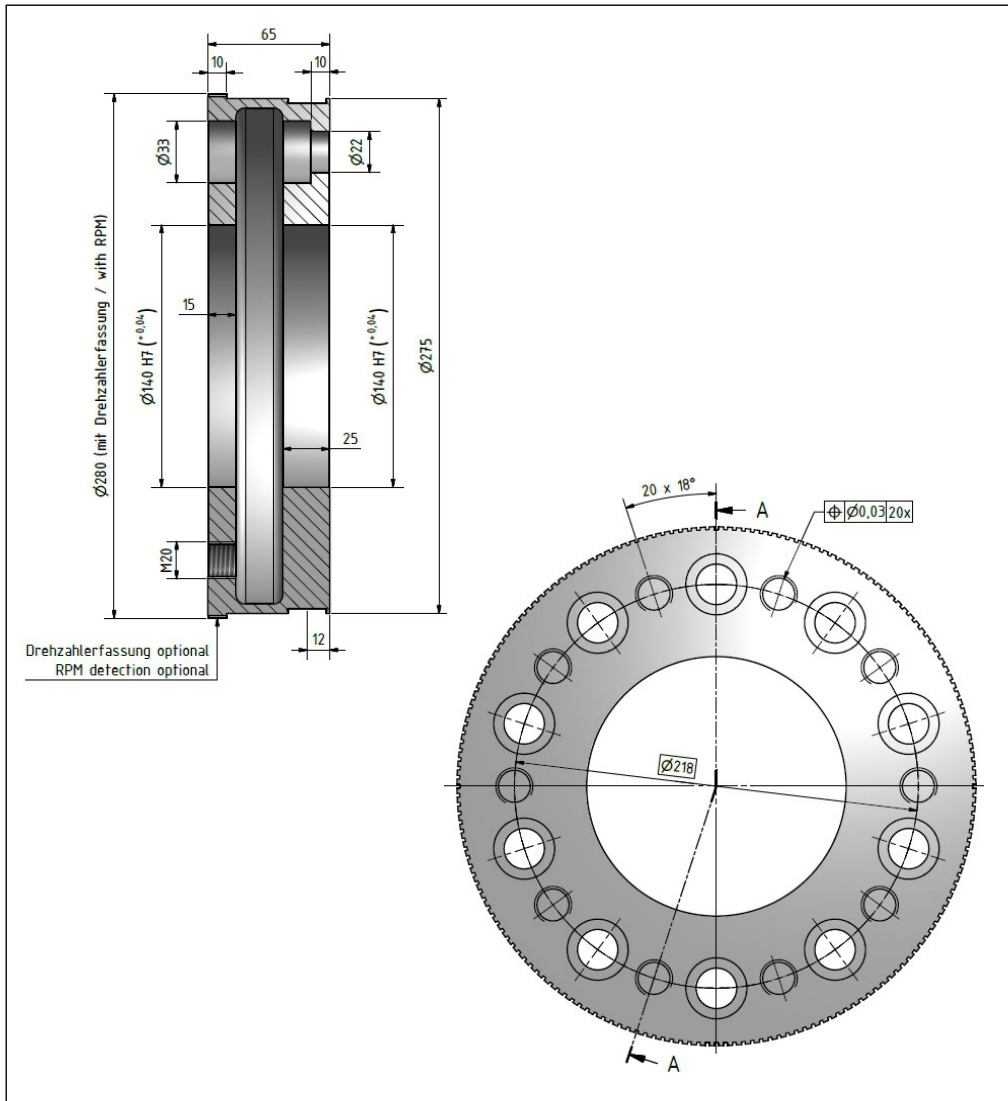


## Type-specific mechanical data

$M_{nom}$ (N·m)	5.000	10.000
Mass (rotor) (kg):	6	6,2
Moment of inertia (kg·m <sup>2</sup> ):	0,122	0,122
(with/without speed detection system)		
Torsional stiffness (kN·m/rad):	4.050	8.050
Angular twist at $M_{nom}$ (°)	0,01	0,01
Axial stiffness (kN/mm) $c_a$ :	1.800	1.800
Radial stiffness (kN/mm) $C_r$ :	8.000	8.000
Bending stiffness (kN·m/rad) $c_b$ :	60	120
Max. axial force (kN):	75	75
Max. lateral force (kN):	75	75
Max. bending moment (kN·m):	35	50
Compression at max. axial force (mm):	<0,08	<0,08
Balancing quality (DIN ISO 1940):	G6,3	G6,3
Max. rotational speed (rpm):	6.000	6.000
Highspeed option (rpm):	9.000	9.000
Speed detection (ppt (pulses per turn)):	120	
Hollow shaft option:	yes	

# Torque transducer with high bending stiffness

measuring range: 15, 20 kN·m

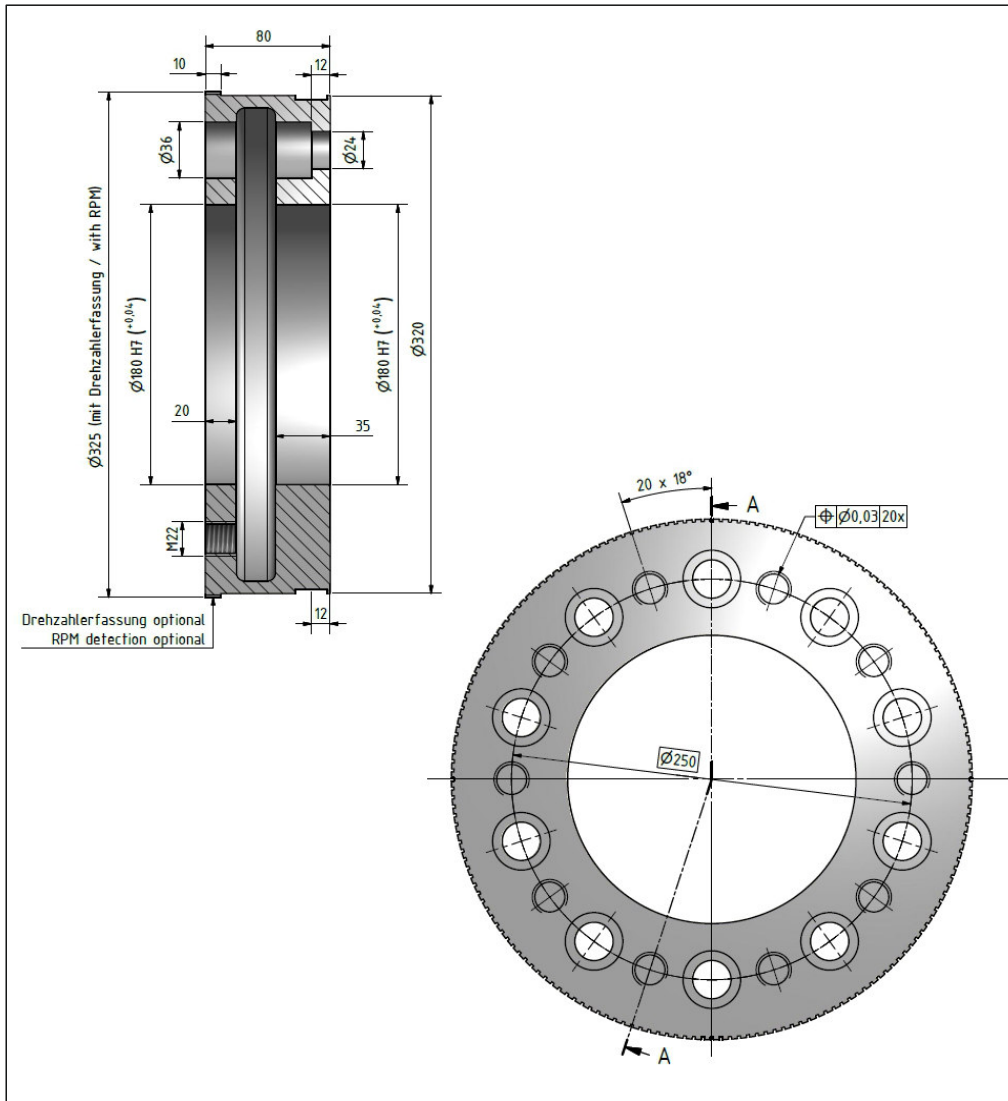


## Type-specific mechanical data

$M_{nom}$ (N·m)	15.000	20.000
Mass (rotor) (kg):	11,5	11,7
Moment of inertia (kg·m <sup>2</sup> ):	0,062	0,251
(with/without speed detection system)		
Torsional stiffness (kN·m/rad):	1.050	2.000
Angular twist at $M_{nom}$ (°)	0,005	0,005
Axial stiffness (kN/mm) $c_a$ :	1.800	3.600
Radial stiffness (kN/mm) $C_r$ :	8.000	16.000
Bending stiffness (kN·m/rad) $c_b$ :	20	40
Max. axial force (kN):	75	150
Max. lateral force (kN):	75	150
Max. bending moment (kN·m):	75	100
Compression at max. axial force (mm):	<0,08	<0,08
Balancing quality (DIN ISO 1940):		G9,4 (G6,3 Option)
Max. rotational speed (rpm):	6.000	4.000
Highspeed option (rpm):	9.000	7.000
Speed detection (ppt (pulses per turn)):	120	270
Hollow shaft option:	yes	yes

# Torque transducer with high bending stiffness

measuring range: 30, 35 kN·m

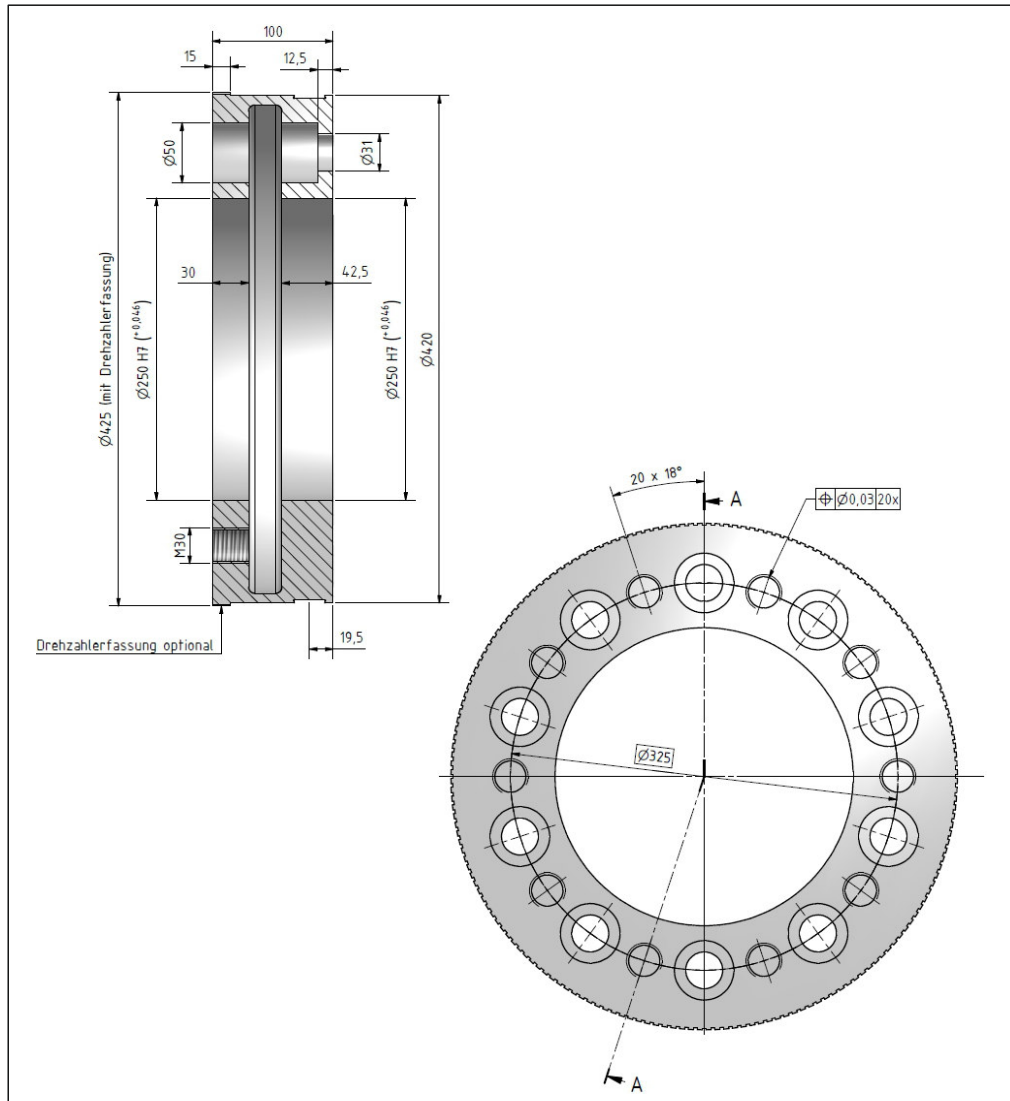


## Type-specific mechanical data

$M_{nom}$ (N·m)	30.000
Mass (rotor) (kg)	17
Moment of inertia (kg·m <sup>2</sup> ): (with/without speed detection system)	1.05
Torsional stiffness (kN·m/rad):	6.000
Angular twist at $M_{nom}$ (°)	0.01
Axial stiffness (kN/mm) $c_a$ :	3.600
Radial stiffness (kN/mm) $C_r$ :	12.000
Bending stiffness (kN·m/rad) $c_b$ :	400
Max. axial force (kN):	170
Max. lateral force (kN):	170
Max. bending moment (kN·m):	150
Compression at max. axial force (mm):	<0.15
Balancing quality (DIN ISO 1940):	
Max. rotational speed (rpm):	4.000
Highspeed option (rpm):	7.000
Speed detection (ppt (pulses per turn)):	360
Hollow shaft option:	

# Torque transducer with high bending stiffness

measuring range: 50, 100 kN·m



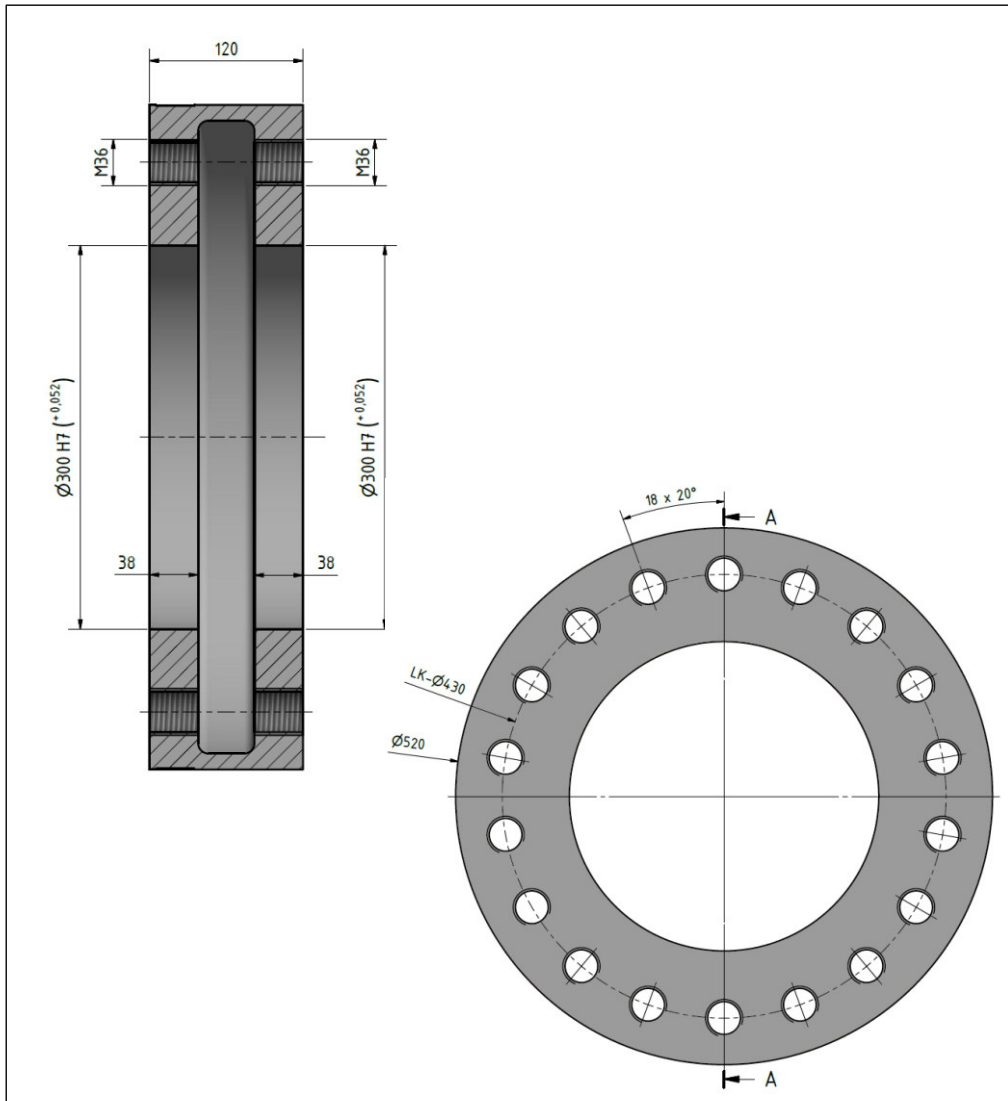
## Type-specific mechanical data

$M_{nom}$ (N·m)	50.000	100.000
Mass (rotor) (kg):	37	38
Moment of inertia (kg·m <sup>2</sup> ):	1.1	1.29
(with/without speed detection system)		
Torsional stiffness (kN·m/rad):	10.000	20.000
Angular twist at $M_{nom}$ (°)	0.01	0.01
Axial stiffness (kN/mm) $c_a$ :	6.000	5.000
Radial stiffness (kN/mm) $C_r$ :	80.000	160.000
Bending stiffness (kN·m/rad) $c_b$ :	80	160
Max. axial force (kN):	350	400
Max. lateral force (kN):	350	400
Max. bending moment (kN·m):	850	1.200
Compression at max. axial force (mm):	<0,15	<0,15
Balancing quality (DIN ISO 1940):	G9.4 (G6.3 Option)	
Max. rotational speed (rpm):	3.000	2.000
Highspeed option (rpm):	4.000	3.000
Speed detection (ppt (pulses per turn)):	360	360
Hollow shaft option:	yes	



# Torque transducer with high bending stiffness

measuring range: 100 - 250 kN·m

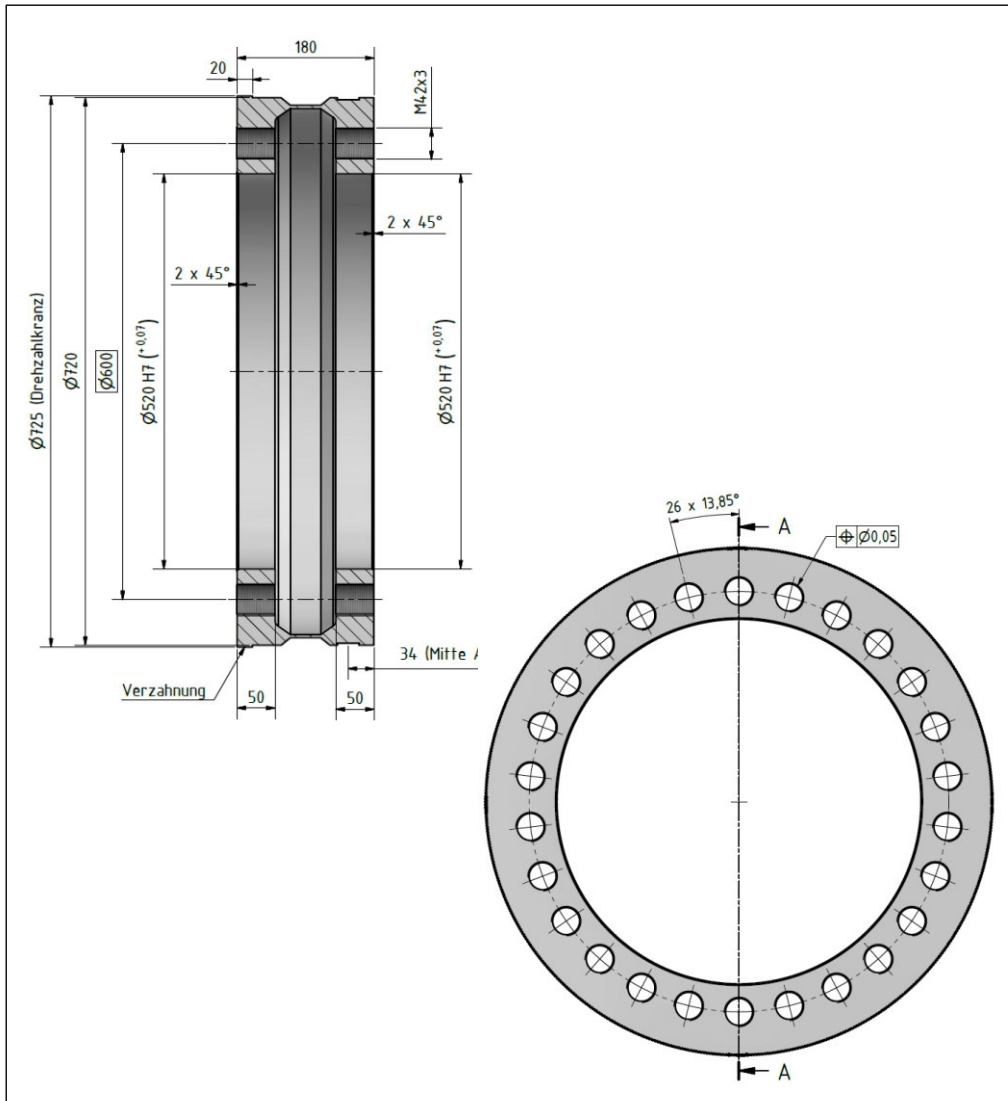


## Type-specific mechanical data

$M_{nom}$ (N·m)	100.000	150.000
Mass (rotor) (kg):	38	40
Moment of inertia (kg·m <sup>2</sup> ):	1,29	1,45
(with/without speed detection system)		
Torsional stiffness (kN·m/rad):	10.000	15.000
Angular twist at $M_{nom}$ (°)	0,01	0,01
Axial stiffness (kN/mm) $c_a$ :	5.000	7.000
Radial stiffness (kN/mm) $c_r$ :	20.000	25.000
Bending stiffness (kN·m/rad) $c_b$ :	160	240
Max. axial force (kN):	400	600
Max. lateral force (kN):	400	600
Max. bending moment (kN·m):	400	600
Compression at max. axial force (mm):	<0,15	<0,15
Balancing quality (DIN ISO 1940):	G9,4 (G8,3 Option)	
Max. rotational speed (rpm):	2.000	2.000
Highspeed option (rpm):	3.000	3.000
Speed detection (ppt (pulses per turn)):	360	360
Hollow shaft option:		

# Torque transducer with high bending stiffness

measuring range: 200 - 600 kN·m

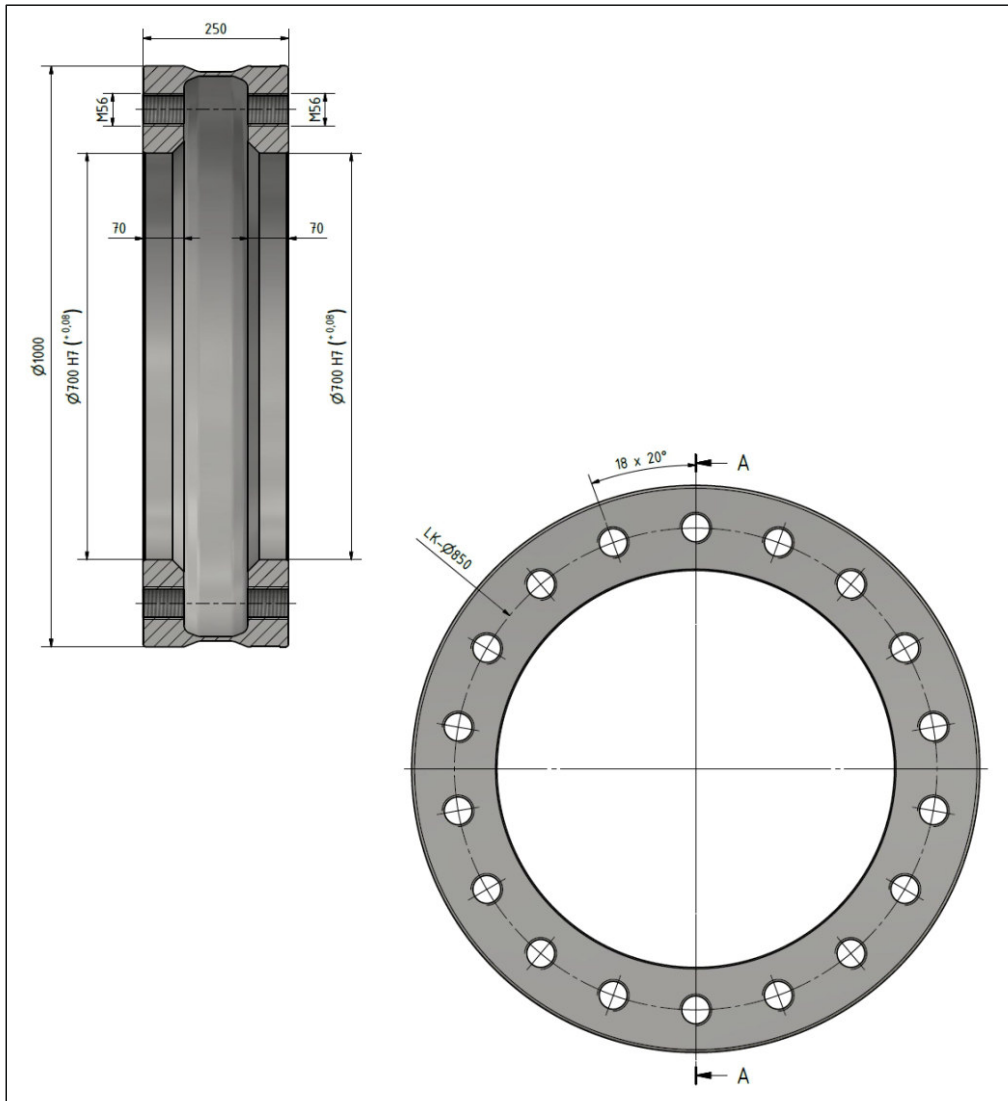


## Type-specific mechanical data

$M_{nom}$ (N·m)	250.000	500.000
Mass (rotor) (kg):	60	80
Moment of inertia (kg·m <sup>2</sup> ):	2	3
(with/without speed detection system)		
Torsional stiffness (kN·m/rad):	25.000	25.000
Angular twist at $M_{nom}$ (°)	0,01	0,01
Axial stiffness (kN/mm) $c_a$ :	11.000	11.000
Radial stiffness (kN/mm) $c_r$ :	40.000	40.000
Bending stiffness (kN·m/rad) $c_b$ :	400	400
Max. axial force (kN):	1.000	1.000
Max. lateral force (kN):	1.000	1.000
Max. bending moment (kN·m):	1.000	1.000
Compression at max. axial force (mm):	<0,15	<0,15
Balancing quality (DIN ISO 1940):	G9,4 (G6,3 Option)	G9,4 (G6,3 Option)
Max. rotational speed (rpm):	1.700	1.700
Highspeed option (rpm):	2.000	1.500
Speed detection (ppt (pulses per turn)):	480	480
Hollow shaft option:		

# Torque transducer with high bending stiffness

measuring range: 600 - 1000 kN·m

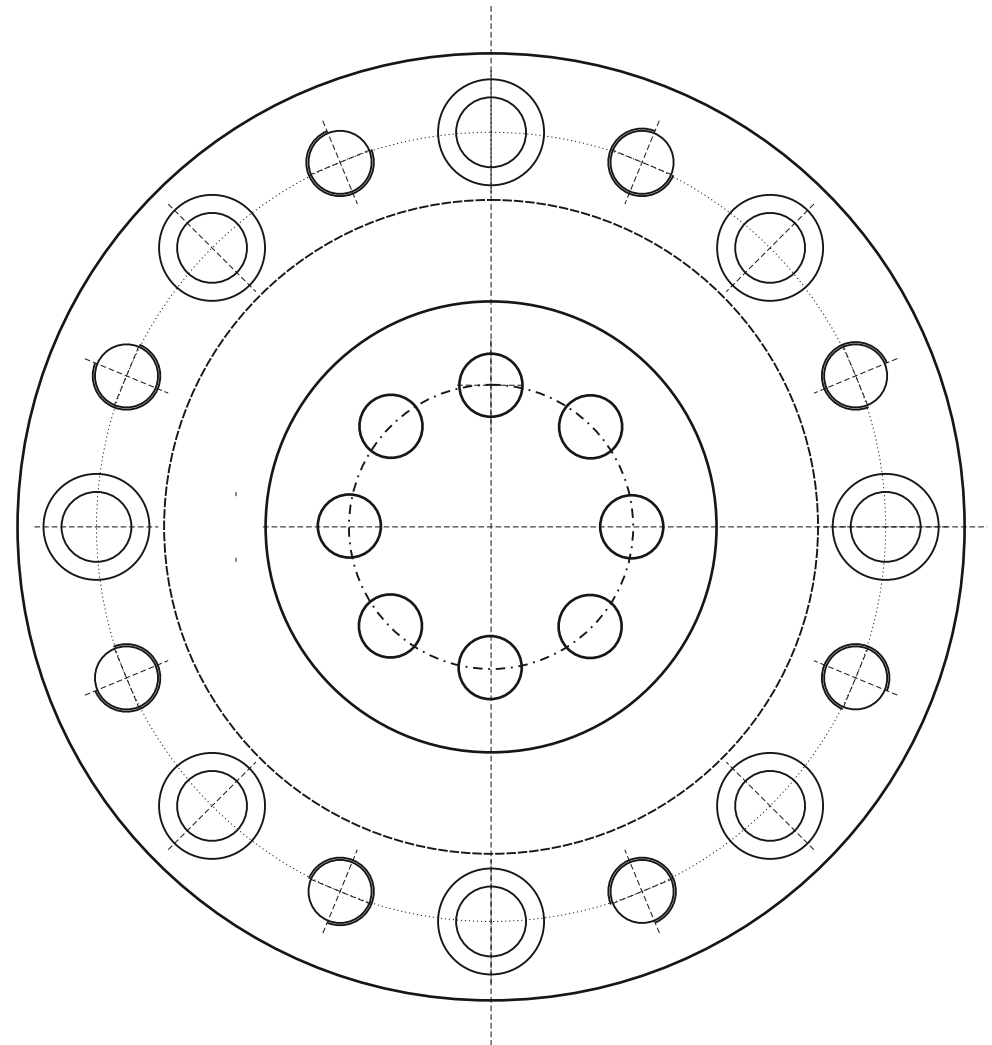
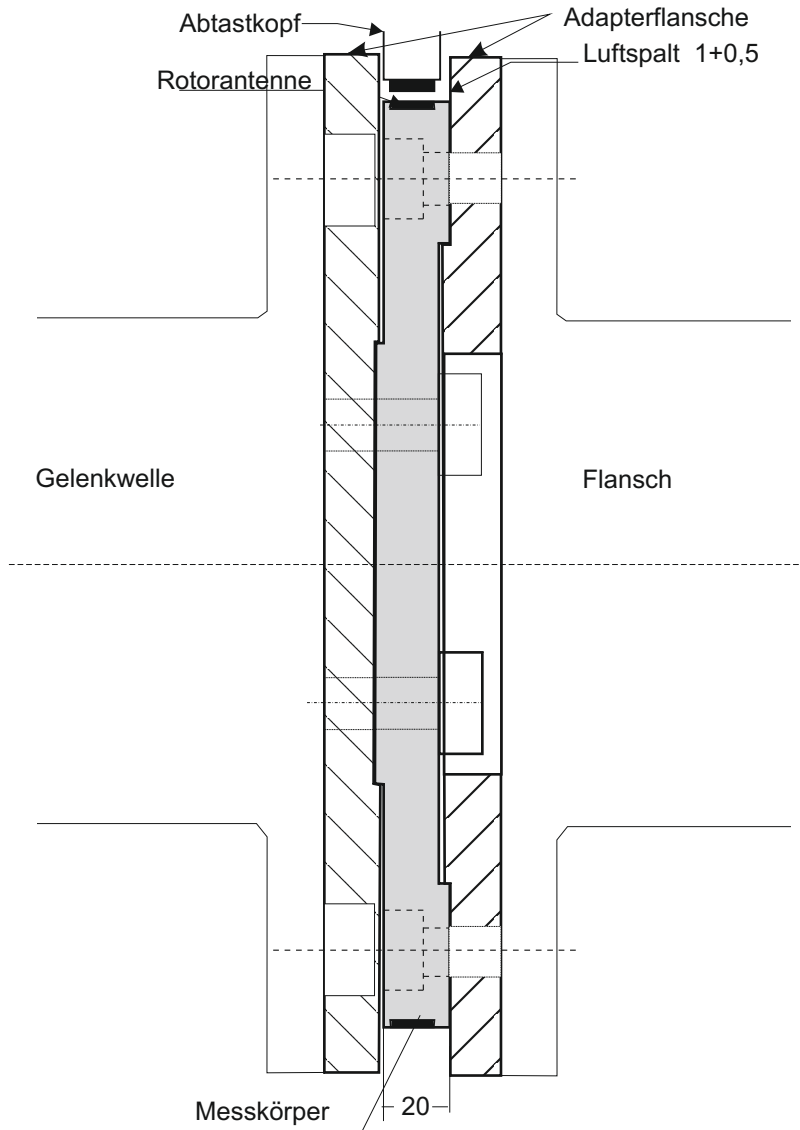


## Type-specific mechanical data

$M_{nom}$ (N·m)	1.000.000
Mass (rotor) (kg):	160
Moment of inertia (kg·m <sup>2</sup> ):	10
(with/without speed detection system)	
Torsional stiffness (kN·m/rad):	50.000
Angular twist at $M_{nom}$ (°)	0,01
Axial stiffness (kN/mm) $c_a$ :	25.000
Radial stiffness (kN/mm) $C_r$ :	80.000
Bending stiffness (kN·m/rad) $c_b$ :	400
Max. axial force (kN):	2.000
Max. lateral force (kN):	2.000
Max. bending moment (kN·m):	2.000
Compression at max. axial force (mm):	<0,15
Balancing quality (DIN ISO 1940):	G9,4 (G6,3 Option)
Max. rotational speed (rpm):	1.700
Highspeed option (rpm):	5.500
Speed detection (ppt (pulses per turn)):	480
Hollow shaft option:	



# Torque transducer







# Mounting Instruction

## Measuring Flanges, Standard

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10120, 1, en\_US

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# 1 Safety

## 1.1 Definition of Warnings



### **DANGER!**

Hint for possible dangerous situation. Ignoring the security terms may cause death or serious injury.



### **WARNING!**

Hint for possible dangerous situation. Ignoring the security terms may cause injury.



### **CAUTION!**

Hint for possible damage of property, if the corresponding protective measure were disregarded.



Further information

## 1.2 General Warnings

The system startup has to be carried out by trained qualified personnel, who is able to evaluate the potential risks. All chapters of this instruction manual had to be read and fully understood before startup.

On non-observance it's not possible to assert a claim for the incurred losses from the manufacturer. Any changes to the system, except those described in the instruction manual and customer documentation, will invalidate any warranty.



### **DANGER!**

#### **Risk of Injury by Incorrect Installation**

*Incorrect installation can cause injury to persons directly while the installation or during the subsequent startup*

#### **Note the Mounting Hint (see chapter 4, installation instruction)**

The system startup has to be carried out by instructed qualified personnel that's familiar with

- the professional handling of security relevant components,
- the valid regulations for operational safety und rules for accident prevention.



### **DANGER!**

#### **Risk of Injury by Unintentional Startup**

*Rotating or moving of parts by inadvertent startup of the machine can cause injury .*

During all mounting, demounting or repairing the system has to be powered-off. Note the mounting instructions.

**DANGER!****Risk of Injury by Movable Parts**

*While normal operation, as well as inadvertent loosening of parts of the telemetry system during operation, present persons may be injured if protective equipment is absent.*

Check the safety function of the protective equipment particularly

- before each startup
- after each replacement of a component
- after a longer standstill
- after each defect

Independent thereof the safety function of the protective equipment must be checked in suitable time intervals as part of the maintenance work!

**WARNING!****Risk of Burn Injury**

*While operation the sensor signal amplifier and the stator antenna may become warm.*

Avoid contact.

**CAUTION!****Risk of Property Damage**

*If the connectors disconnected / connected while the system is powered on the telemetry system as well as the connected devices can be damaged.*

**Plug connectors must not be disconnected / connected when the system is powered on.**



## 2 Conventional Usage

Sensor telemetry systems are used for contact-free data and power transfer from passive and active sensors (e.g. on rotating shafts).



### **DANGER!**

#### **Risk of Subsequent Damages caused by Malfunctions**

*If the telemetry system is used for controlling or regulating functions it is not conceivable for, subsequent damages up to injury to persons can be caused.*

**The delivered system has to be used exclusively used for the purpose for which it was ordered.**

The operator must take care of his health and safety.

The operator of the equipment must prevent subsequent errors following faulty measuring results. This is particularly necessary if the telemetry system is used in controlling or regulating functions.

**The customer, as the builder of a system with an integrated sensor telemetry system, is responsible for the correct and conform operation and also assumes the responsibility for ensuring that the system at start-up complies with all provisions of Directives 2014/53/EU and 2014/35/EU.**

### **Scope of Delivery**

A telemetry system normally contains:

- Evaluation unit
- Stator antenna
- Rotor antenna
- Sensor signal amplifier
- HF cable



For the detailed purchased parts package of the delivered telemetry system mind the corresponding shipping ticket.

### 3 Technical Data

#### 3.1 Measuring System

##### Technical Data Telemetry System

Term	Value
HF frequency	13.56 MHz
Number of channels	1
Bandwidth	0 to 1 kHz (-3dB)
Linearity	<0.1%

##### General Measuring Configuration

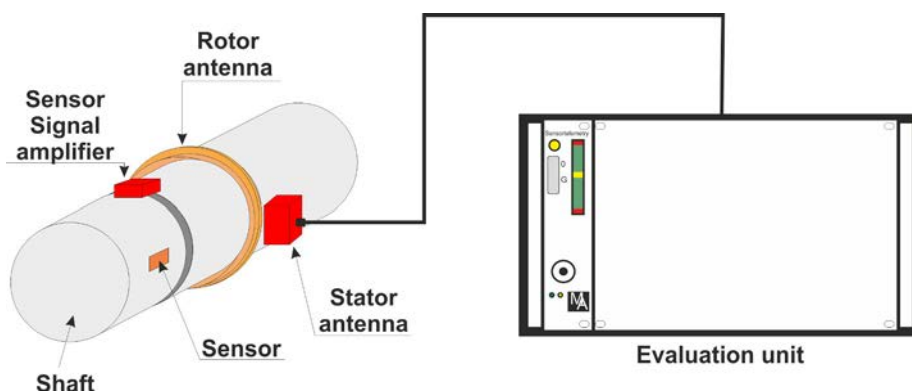


Fig. 1: General measuring configuration

##### Block Diagram

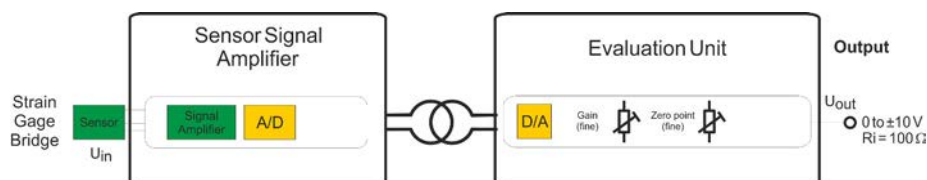


Fig. 2: Block diagram

##### Energy and Data Flow

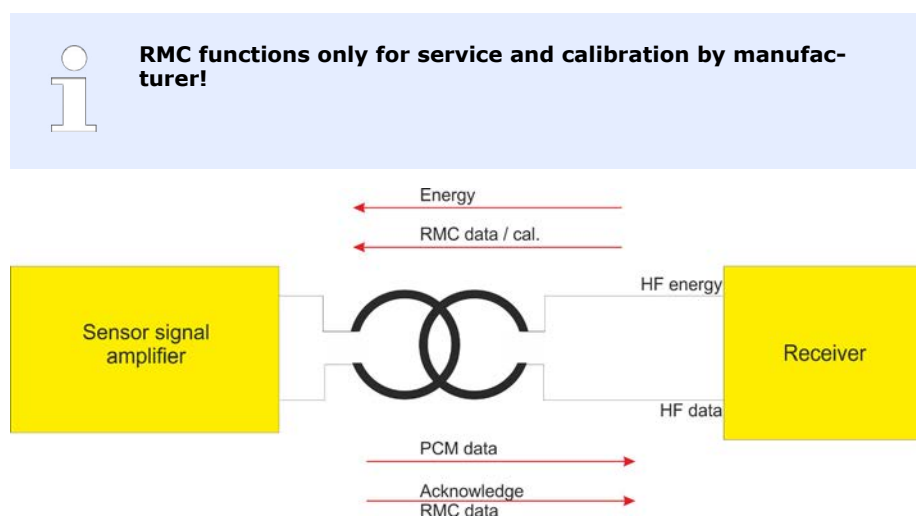


Fig. 3: Energy and data flow

### 3.1.1 Torque Measuring Flange

#### Technical Data Measuring Flange



The technical data of the measuring flange supplied may differ. Note delivery documents!

Term	Value
Maximum load (relating to nominal torque)	400%
Maximum breaking load (relating to nominal torque)	800%
Sensor	Strain gauge (strain gauge resistor $\geq 350 \Omega$ )
Type of modulation	PCM
HF frequency	13.56 MHz
Channel sample rate	6.62 kS/s
Bridge supply voltage [ $U_B$ ]	3.3 V
Zeropoint and gain drift	0.05% / 10°C
Linearity	0.05%
Amplification	fix set
Bandwidth	0 to 1 kHz
Resolution	16 Bit with 16 Bit CRC
Protection class	IP52
Temperature range	-10 to +85°C

#### 3.1.1.1 Gain Bandwidth Characteristic

##### Gain Bandwidth Characteristic

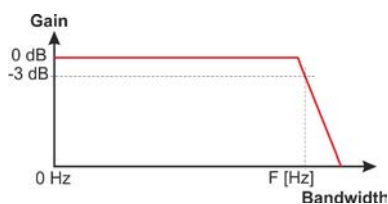


Fig. 4: Gain bandwidth characteristic



The output signal bandwidth ranges from 0 to 1 kHz.

### 3.1.1.2 Sensor Operation Mode

#### Sensor Operation Mode Full Bridge

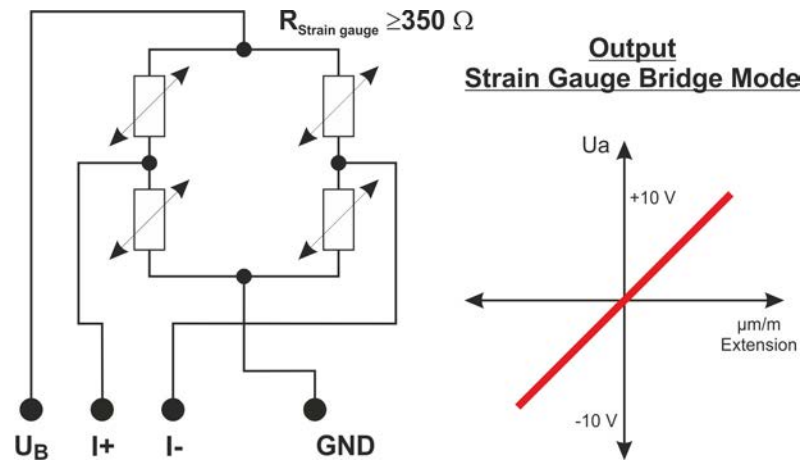


Fig. 5: Operation mode strain gauge (full bridge)

### 3.1.1.3 Remote Shunt Calibration Function

#### Remote Shunt Calibration Function

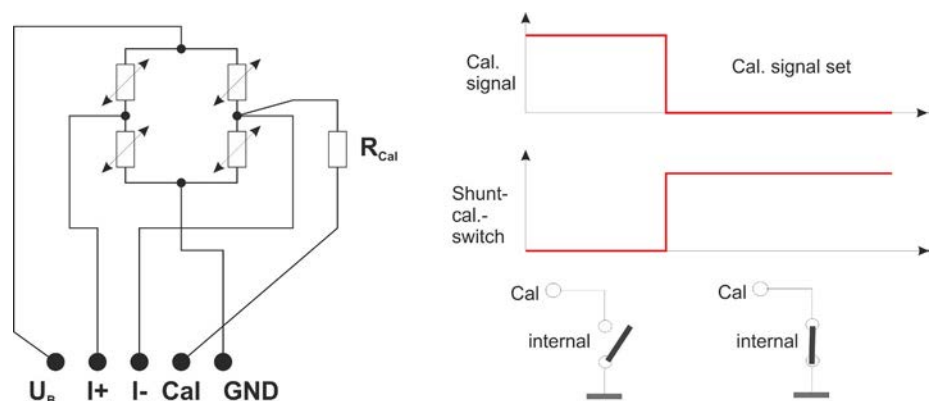


Fig. 6: Remote shunt calibration function



Calibration value see calibration certificate.

## 4 Mounting / Starting

### 4.1 Mounting Instruction Measuring Flange

#### 4.1.1 Safety instructions

##### General

Please read the operating and safety instructions very carefully. You must understand and apply these instructions in order to avoid risks.

The torque measuring flange corresponds to the latest state of the art and is fail-safe. Nevertheless there are residual risks, if the torque measuring flange is used and operated improperly by untrained personnel.

The torque measuring flange consists of some sensitive components and may be very heavy. Therefore everybody dealing with transport, storage, mounting, putting into operation, operation, maintenance and/or repair must have read and understood the notes and especially the safety instructions.

##### Proper use

The use of torque measuring flanges is exclusively restricted to torque measuring tasks and the directly related control tasks. Any further use shall be deemed to be improper.

For safe operation the torque measuring flange and its accessories may only be used according to the data and specifications given in the operating instructions. All components of the torque measuring flange shall not be treated as safety elements. In addition, the legal requirements and safety instructions for the respective application must be complied with.

##### Modifications

Without our consent neither the safety nor the design specifications of the torque measuring flange and its accessories may be modified. In case of any modifications we are not liable for any consequential damages.

##### Qualified personnel

Qualified personnel are persons who are familiar with the transport, storage, mounting, putting into operation, operation and maintenance of the torque measuring flange and its accessories as well as with the respective application. They must be qualified for this activity. The torque measuring flange and its accessories may only be used and/or operated by qualified personnel in accordance with the technical data and the relevant legal requirements and safety regulations.

##### Residual risks

When planning, equipping and operating the respective application, the safety aspects must be planned and implemented in addition to the torque measuring technology in order to minimize residual risks, observing at the same time the relevant regulations.

##### Accident prevention

In order to prevent accidents the relevant regulations for accident prevention of the employers' liability insurance associations must be complied with when mounting and putting into operation the torque measuring flange and its accessories. As to protective equipment such as covers and casings the following requirements must be met:

- protective equipment must not rotate simultaneously
- protective equipment must be far enough from the moving components and must not allow to put one's hand through
- protective equipment must cover squeezing and shearing areas and protect against components which may come off
- protective equipment must be provided, even if the moving components of the torque measuring flange are not directly located at the workplace or in the transit area of persons and other objects.

These requirements may only be departed from, if sufficient accident prevention has already been ensured by other protective equipment.



## 4.1.2 Functional Description

### Torque measurement

The rotating torque measuring flange works with high-precision strain gauge bridges which are connected like a Wheatstone bridge. A measuring amplifier mounted in the torque measuring flange supplies the strain gauge bridge with constant voltage and amplifies the measuring signal. The torque measuring flange measures static and dynamic torque on rotating and stationary shafts.

The analog measuring signal is amplified and modulated to high frequency.

The torque measuring signal and energy are transmitted contact-free and are thus absolutely maintenance- and wear-free. The measuring signal is transmitted inductively according to the proven transformer principle.

The stationary receiving antenna (pickup) is the coupling element between evaluation unit and torque measuring flange.

In the evaluation unit the digitized torque signal is transformed into an analog output signal of 0 to  $\pm 10$  Volt.

### Remote shunt calibration

The remote shunt calibration serves to control the torque measuring flange. By pressing the CAL key a defined torque signal is simulated on the torque measuring flange, resulting in a corresponding change of the output voltage (calibration value) which is specified in the calibration report

If the desired output voltage is not reached, there must be a defect.

### Rotational speed measurement (option)

The rotational speed is measured according to the magneto resistor principle. The corresponding toothed rim at the torque measuring flange provides a certain number of pulses depending on the flange diameter.

## 4.1.3 Mounting Instructions



### **DANGER!**

#### **Risk of Injury Caused by Deficient Fastened Measuring Flange**

*While operation the measuring flange may loosen itself and if it is deficient fastened. Injury to persons is possible.*

During mounting of the torque measuring flange ensure that the flange screws are tightened with the specified nominal tightening moment!

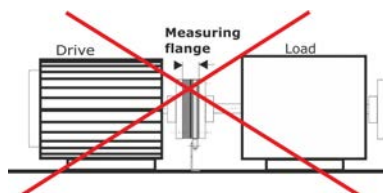
### Offset angle



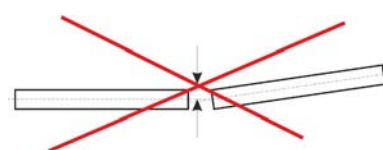
**CAUTION!**  
**Risk of Damaging**

*If the drive and the load are coupled directly offset angle may be caused. Damaging of the flange or drive/load are possible.*

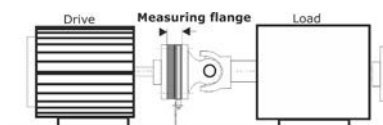
Decoupling over universal joint shaft in case of offset angle



Do not couple drive and load directly



Offset angle



Decoupling over universal joint shaft in case of offset angle

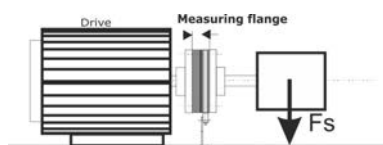
### Misalignment of axes



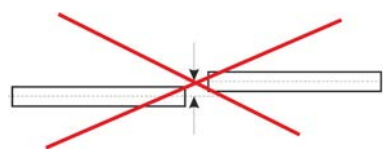
**CAUTION!**  
**Risk of Damaging**

*If the drive and the load are coupled directly misalignment of axes may be caused. Damaging of the flange or drive/load are possible.*

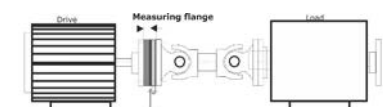
Decoupling over universal joint shaft in case of misalignment of axes



Consider max. lateral force



Misalignment of axes



Decoupling over universal joint shaft in case of misalignment of axes

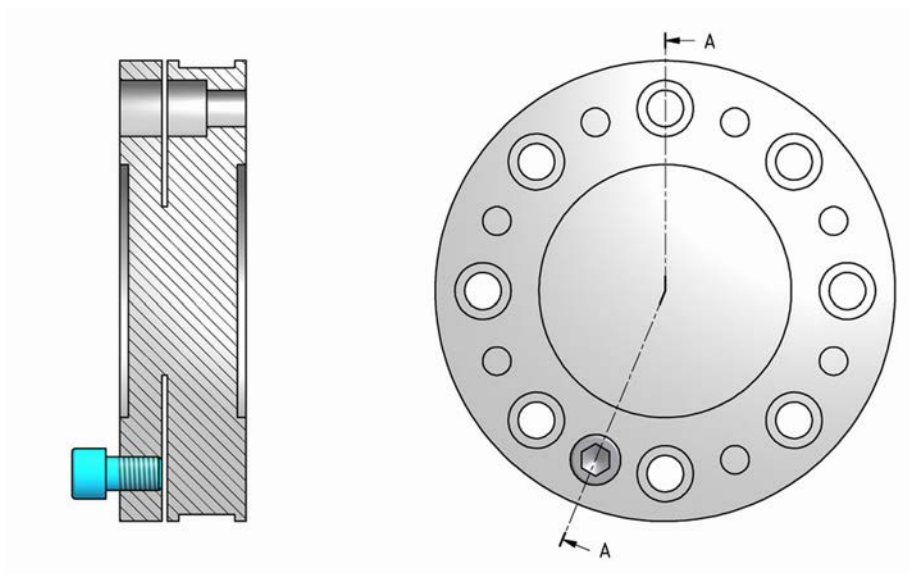
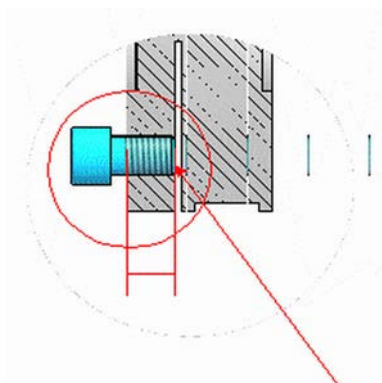
### Screw length



**CAUTION!**  
**Risk of Damaging by Fastening Screws**

*If the screws were tighten to deep the threads of the measuring flange may be damaged*

When tightening the screws, they must be turned in as deep as possible, but they must not protrude from the thread!



## 4.1.4 Mounting

### Preparation, cleaning

Prior to mounting the torque measuring flange clean all surfaces. The surfaces must be clean and grease-free. Clean them with a piece of cloth in order not to damage the surfaces. Be careful that solvents do not enter the torque measuring flange or the induction loop.

### Screwing



In order to improve the screwed connection, apply a very thin layer of  $\mu$  paste with a cloth to the contact surfaces.



#### **DANGER!** **Risk of Injury caused by Deficient Fixing**

*The measuring flange may loosen itself while operating if it is fixed with unsuitable screws*

For screwing only use the screws listed in the table ( & Table 1 "Fastening Screws" on page 14) with the specified strength.



#### **NOTICE!**


For screwed connections, clean the thread of the screw and the measuring flange. Provide lubricant (oil) to prevent "seizure" of the connection.

Table 1: Fastening Screws

Fastening screws	Property class	Tightening moment (Nm)	
		Coefficient of friction	
		0,100	0,140
M5	10.9	7,3	8.9
M6	10.9	12,5	15.5
M8	10.9	30	37
M10	10.9	60	75
M12	10.9	104	130
M14	10.9	165	205
M16	10.9	250	310
M18	10.9	350	430
M20	10.9	490	620
M22	10.9	670	830
M24	10.9	850	1060
M27	10.9	1250	1550
M30	10.9	1700	2100

according to DIN 13 T 13

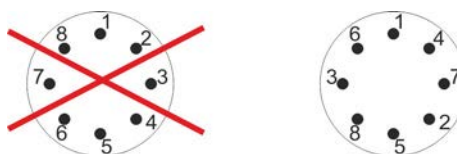
### Sequence for tightening the screws



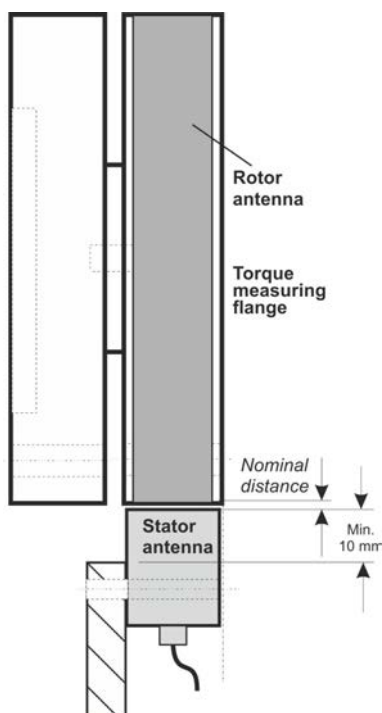
**CAUTION!**  
**Risk of Damaging Caused by Deficient Screwing**  
*The measuring flange may be damaged if the fastening screws where tighten in unsuitable sequence*

Tighten the screws in the sequence as shown below (see example). Take the specified tightening moment of the screws into consideration.

Example: 8 screws



## Mounting of antenna



The receiving antenna (pickup) must be mounted centered to the induction loop and that the minimum and maximum distances must be for all angle positions of the shaft. The distance between the receiving antenna and the induction loop must be equal everywhere.



### **Nominal Distance Torque Measuring Flange - Receiving Antenna**

See mounting instruction, antenna coupling.

## 4.1.5 Minimum distances

### Minimum distance shaft - shaft cover

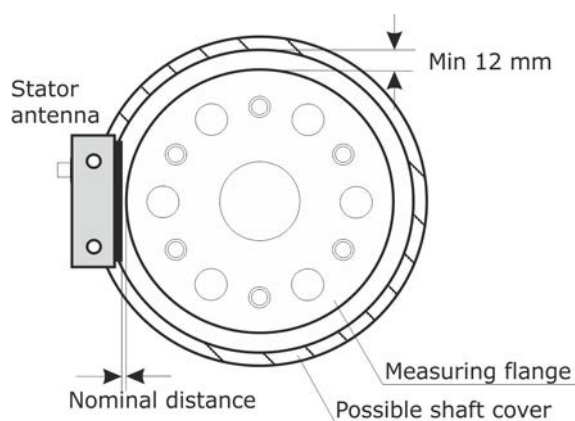


### **DANGER!** **Risk of Injury**

*Disregarding of accident prevention instructions may cause serious injury*

Absolutely comply with the accident prevention instructions!

The distance of the antenna to the induction loop must be equal everywhere.



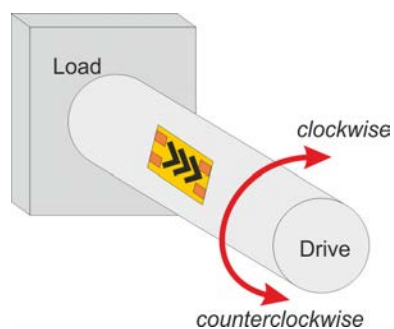
### **Nominal Distance Torque Measuring Flange - Receiving Antenna**

See mounting instruction, antenna coupling.



## 4.1.6 Definition / Polarity Signal

### Polarity



Rotating direction	Polarity
right-turning (clockwise)	Positive signal
left-turning (counterclockwise)	Negative signal

## 4.2 Coupling / Installation (Example)

### Antenna Coupling



#### **DANGER!**

#### **Risk of Faulty Measuring Data and Resulting Subsequent Errors, up to Injury to Persons**

*Damaging, modifications or disturbance of the coaxial cable(s) may falsify the measuring results and optionally cause subsequent errors according to operation purpose.*

Do not buckle the coaxial cable!

Do not modify the coaxial cable!

Do not keep data cable and the coaxial cable together with energy- / high-power current cables!

The connectors of the HF energy and / or HF data coaxial cable must not have connection to the grounding of the machine!

Permissible bending radii for coaxial cables:

- RG58 →  $R_B = 25 \text{ mm}$
- RG400 →  $R_B = 30 \text{ mm static / 50 mm dynamic}$
- RG178 →  $R_B = 15 \text{ mm}$
- RG213 →  $R_B = 50 \text{ mm}$
- RG316 →  $R_B = 15 \text{ mm}$

The bending radii of the used coaxial cables must not be undercut



#### **CAUTION!**

#### **Damaging of Antenna System**

*Contact between rotor antenna and stator antenna while operating may cause mechanical damages of the antennas*

The stator antenna must not touch the rotor antenna.



#### **CAUTION!**

#### **Risk of Damaging of Electronic, Faulty Measuring Data**

*While overheating of the evaluation unit the built-in electronics may be damaged*

*An overheated evaluation unit may cause faulty measuring values and respectively subsequent errors*

The evaluation unit must be mounted onto a heat conductive base.



#### **CAUTION!**

#### **Damaging of Evaluation Unit Caused by High Vibrancy**

*High Vibrancy of the evaluation unit may cause damaging*

While mounting in environments with high vibrancy (e.g. in vehicles) the evaluation unit must be mounted vibration damped, e.g. by rubber buffer.



The stator antenna must be mounted directly opposite to the rotor antenna

The stator antenna must be mounted in the middle of the moving range of the rotor antenna

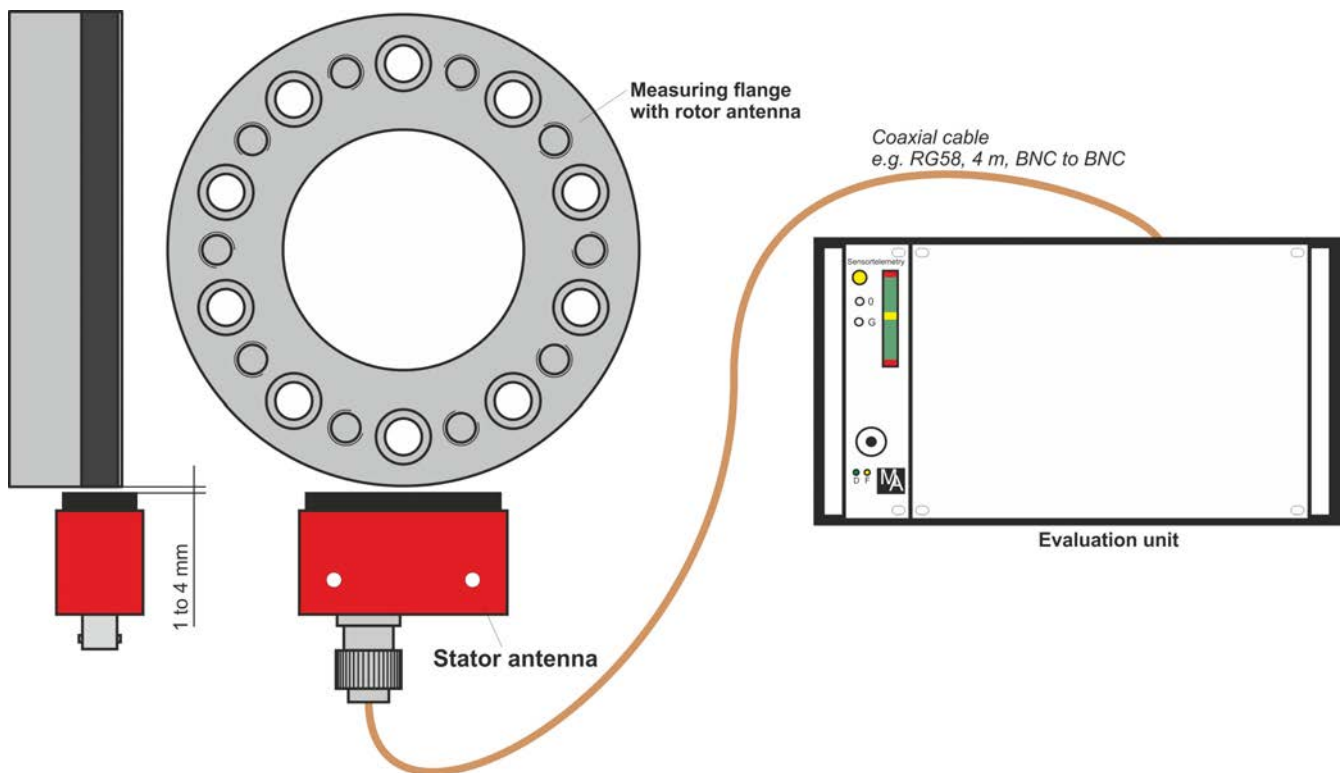


Fig. 7: Coupling

## Starting



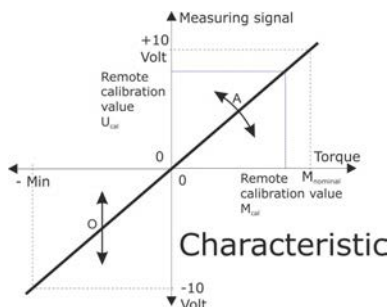
### **DANGER!** **Risk of Injury**

*Incorrect installation can cause injury to persons directly while the installation or during the subsequent startup*

Follow mandatory the rules for accident prevention!

1. ▶ Mount the measuring flange
2. ▶ Place the stator antenna correct to the rotor antenna
3. ▶ Connect stator antenna with the evaluation unit
4. ▶ Switch the evaluation system on
5. ▶ Further steps see

## 4.3 Adjustment



### Electrical Assembly

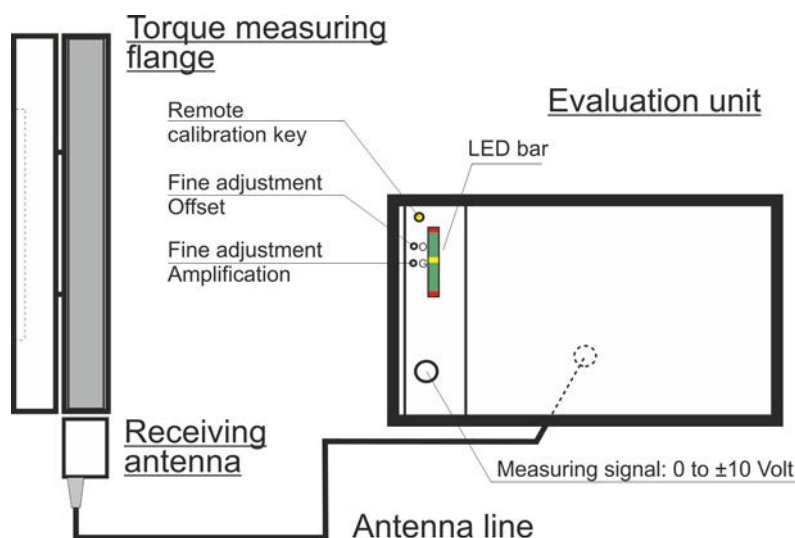


Fig. 8: Electrical assembly

### Adjustment of Stator Antenna

1. ▶ After assembly of electrical connections, turn the evaluation unit on. The red LED on the receiving antenna lights up.
  - ⇒ The middle, yellow LED on the LED bar at the receiver lights up.
 

If the LED does not light up, control the electrical connections and correct them, if necessary. Adjust the headless screw on the receiving antenna until the yellow LED on the LED bar lights up.
2. ▶ Press the remote calibration key or set the remote calibration signal and control whether the signal output at the evaluation unit and/or the display on the LED bar changes.
  - ⇒ If deflection is not possible, control electrical connections again and correct them, if necessary. Adjust the headless screw on the receiving antenna until the yellow LED on the LED bar lights up and deflection is possible with the remote calibration key or remote calibration signal.

### Zero point and amplification adjustment

1. ▶ Relieve measuring position (torque measuring flange) completely of load.
2. ▶ Adjust zero point by turning the potentiometer "Z" (Zero), respectively "0", and by measuring the voltage at the output (measuring signal) to 0.000 V.



#### CAUTION!

By adjusting the output signal with the screw 'G' the analog output is no longer calibrated!

A change in the gain with the screw 'G' is intended for adjustment before calibration and must therefore not be adjusted.

### 4.3.1 New Adjustment

#### Action to be Taken in Case of Mis-adjusted Amplification (Loss of Calibration Value)

1. ► Relieve measuring position (torque measuring flange) completely of load.
2. ► Adjust zero point by turning the potentiometer "Z" (Zero), respectively "0", and by measuring the voltage at the output (measuring signal) to 0.000 V.
3. ► Press and hold the remote calibration switch or set the remote calibration signal permanently.

Adjust to the calibration value specified in the calibration certificate by turning the potentiometer "G" (Gain) and measuring the output (measuring signal).

Alternative: Load the measuring position with nominal load.

Adjust to +10.000 V by turning the potentiometer "G" (Gain) and measuring the output (measuring signal).

4. ► Release measuring position (torque measuring flange) completely of load.
5. ► Control the zeropoint by measuring and repeat step 1 to 5 if necessary.



## 5 Maintenance

The systems of Manner Sensortelemetrie are low-maintenance.



**DANGER!**

**Risk of Injury Caused by Defects on System Built-Up**

*Particularly loose or damaged parts may endanger present persons*

Carry out the maintenance regularly and assiduously.

**Within a periodical repeating maintenance following operations have to be done:**

- Clean the antenna system, vacuuming of dust deposit
- Check the antenna system for scrub marks or mechanical damages
- Check the fastening of the stator antenna for a fix seat and tighten of the screwed fastenings where necessary.
- Check the plug connections and cables



Document the completed annual maintenance

## 6 Contact



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