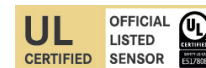




The illustration shows the TRT/S3 as single turn version with radial connector outlet.

- **Contactless, wear-free sensor system**
- **Also as singleturn respectively speed sensor available**
- **High vibration and shock resistance thanks to the robust mechanical design**
- **SIL2 and Performance Level d certified**
- **Safe position and safe speed signal**
- **Unsafe position and speed signal (grey channel)**
- **Resolution: up to 65536 steps / 360° (16-bit)**
- **Slewing ring function on request**
- **Protection type: up to IP69K**
- **EX-protection versions for zone 1/21 or 2/22 available**



## KEY INFORMATION OVERVIEW

### DESIGN AND FUNCTION

Recording of the angular position and revolutions - absolute multiturn transmission for up to 4096 revolutions - data output plus parameterisation and diagnosis via PROFINET.

Robust housing manufactured from seawater-resistant aluminium or stainless steel - stainless steel shaft - ball bearing with radial shaft seal - magnetical sensor system - electrical connection via M12 connector or cable outlet.

The integrated 2-fold switch enables the TWK PROFINET absolute encoders to be used in star, tree and line network topologies.

With the code type "S", the TRT/S3 offers a safe slewing ring functionality. This translates the position value of the sensor shaft into the position of a slewing ring or a rotary table, with any transmission ratio between the slew ring and the encoder pinion.

In addition to the safety module, an unsafe module (grey channel) is available for accessing the position and speed value, which can optionally be used to process the encoder data in the unsafe program of the controller

### FEATURES INTERFACE

The Profinet interface according to IEC 61158 / 61784 or PNO specifications order No. 2.712 and 2.722, version 2.2 or V2.41 (only HW version 2) is integrated into the model series TRT absolute encoders.

Real time classes 1 and 3 are supported, i.e. Real Time (RT) and Isochronous Real Time (IRT) plus the requirements of conformance class C.

To achieve the SIL2 level, the TRT/S3 contains additional internal monitoring mechanisms as well as safe communication via PROFIsafe. The PROFIsafe protocol is implemented according to the PROFIsafe Profile for Safety Technologie (PNO Order No. 3.192) version 2.4 and version 2.6 (only HW version 2).

An exhaustive description of integration into a PROFINET network can be found in the [TRT 12846](#) manual.

- Real Time (RT) and Isochronous Real Time (IRT)
- Device exchange without interchangeable medium or programming device
- Prioritised start-up (Fast Start Up)
- Media redundancy possible
- Firmware update via Profinet
- Programming via Profinet

If the device is used in a manner not specified by the manufacturer, the protective effect of the device may possibly be impaired.

## TECHNICAL DATA

### ELECTRICAL DATA

|                                              |                                                                                                                                                                                                                                                                                                                              |                                                                                     |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| UL® note                                     | UL® : Use a power supply according to IEC/UL60950-1 / IEC/UL62368-1 / VDE 0805 SELV using a current interrupter according to UL61010, table 18, ≤8.33 A @ 24 VDC (≤120 s) or LEC/LPS/Class2.                                                                                                                                 |  |
| Sensor system                                | magnetic                                                                                                                                                                                                                                                                                                                     |                                                                                     |
| Operating voltage                            | + 15 VDC to + 35 VDC, ULus: + 15 VDC to + 29.9 VDC<br>(+ 9 VDC to + 35 VDC on request)<br>(reverse voltage protection)                                                                                                                                                                                                       |  |
| Power consumption                            | < 3 W                                                                                                                                                                                                                                                                                                                        |                                                                                     |
| Switch-on current                            | < 500 mA                                                                                                                                                                                                                                                                                                                     |                                                                                     |
| Resolution                                   | 4096 steps / 360° - (12 bit) or 8192 steps / 360° (13 bit)<br>HW version 2 in addition: 16 Bit respectively 65536 steps / 360°<br>(Singleturn devices are always delivered with a maximum resolution of 16 bits.<br>It can be changed by the user to lower values. See "Programmable parameters" on <a href="#">page 4</a> ) |                                                                                     |
| Measuring range                              | 4096 revolutions (mutliturn version)                                                                                                                                                                                                                                                                                         |                                                                                     |
| Total number of steps                        | 24 bit or 25 bit<br>HW version 2: 28 bit                                                                                                                                                                                                                                                                                     |                                                                                     |
| Absolute accuracy of the position value:     | ± 0.2 % (with reference to one revolution)<br>± 0.1 % (singleturn version)                                                                                                                                                                                                                                                   |                                                                                     |
| Absolute accuracy of the speed value:        | ± 0.8 % (related to the maximum value of 32767 steps/gate time)<br>± 0.4 % (singleturn version)                                                                                                                                                                                                                              |                                                                                     |
| Internal updating time of the position value | 1 ms                                                                                                                                                                                                                                                                                                                         |                                                                                     |
| Internal updating time of the speed signal   | 1 ms                                                                                                                                                                                                                                                                                                                         |                                                                                     |
| Output code                                  | binary                                                                                                                                                                                                                                                                                                                       |                                                                                     |
| Code path                                    | CW / CCW                                                                                                                                                                                                                                                                                                                     |                                                                                     |
| Speed signal                                 | 16-bit, with prefix, unit: steps / gate time<br>(gate time adjustable in the 10 ... 1000 ms range, default: 10 ms)                                                                                                                                                                                                           |                                                                                     |

### INPUT DATA\*

2-byte status word  
4-byte position data  
2-byte speed data

### OUTPUT DATA\*

2-byte control word  
4-byte reference value

### PROFINET DATA

|                            |                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------|
| MAC address                | 88:A9:A7:BX:XX:XX<br>The relevant, current MAC address is located on the model plate. |
| Transfer technology        | 100 Base-TX                                                                           |
| Transfer rate              | 10 / 100 MBit/s                                                                       |
| Line length                | Max. 100 m (between two subscribers)                                                  |
| Minimum transmission cycle | 250 µs                                                                                |
| Profinet version           | V2.2, HW version 2: V2.41                                                             |
| Profisafe version          | V2.4, HW version 2: V2.4 and V2.6                                                     |
| Encoder profile version    | V1.0, firmware version 4.1: V4.2                                                      |

### DIAGNOSIS LEDS

|                       |                                           |
|-----------------------|-------------------------------------------|
| LED 1 (VS, green)     | power supply                              |
| LED 2 (L1, green)     | link 1, network connection established    |
| LED 3 (L2, green)     | link 2, network connection established    |
| LED 4 (NS, green/red) | device and network status and error modes |

Note  
From firmware version 4.1 onwards, the data formats (telegrams) of the encoder profile 4.2 are also supported.

\* From the point of view of the control system.

## TECHNICAL DATA

### MECHANICAL DATA

Operating speed ..... 1000 rpm max., IP65: 2000 rpm max., HW version 2 IP65: 5000 rpm max.  
Angular acceleration .....  $10^5 \text{ rad/s}^2$  max.  
Moment of inertia (rotor) .....  $20 \text{ gcm}^2$   
Operating torque .....  $\leq 8 \text{ Ncm}$  (at 500 rpm).  
Starting torque .....  $\leq 4 \text{ Ncm}$   
Perm. shaft load ..... 250 N axial and radial, flange form 64-HP up to 500 N axial and radial  
Bearing service life \* .....  $> 10^9$  revolutions  
Weight ..... ca. 0.45 kg (stainless steel version ca. 0.7 kg)

### ENVIRONMENTAL DATA

Operating temperature range ..... - 40 °C to + 85 °C, HW version 2: - 40 °C to + 70 °C  
Storage temperature range ..... - 40 °C to + 100 °C (without packaging)  
Resistance ..... To shock .....  $500 \text{ m/s}^2$ ; 6 ms (DIN EN 60068-2-27)  
To vibration .....  $250 \text{ m/s}^2$ ; 10 to 2000 Hz (DIN EN 60068-2-6)  
Protection type ..... IP66/IP67, with cable outlet IP68, IP69K optional (DIN EN 60529),  
with nilos ring instead of shaft seal ring: IP65  
(protection types not tested by UL)  
Salt mist test ..... Test Kb according to IEC60068-2-52  
Maximum altitude ..... 2000 m

### EMC STANDARDS

|                                     |                                                                                                                                                                                                                                                                                           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 61000-6-4:2006 + A1:2011         | EMC Part 6-4: Generic standards-Emission standard for industrial environments                                                                                                                                                                                                             |
| EN 61000-6-2:2005                   | EMC Part 6-2: Generic standards-Immunity for industrial environments                                                                                                                                                                                                                      |
| EN 61000-4-2:2009                   | EMC Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test                                                                                                                                                                                                  |
| EN 61000-4-3:2006 A1:2008 + A2:2010 | EMC Part 4-3: Testing and measurement techniques - Radiated, radio frequency. electromagnetic field immunity test                                                                                                                                                                         |
| EN 61000-4-4:2004                   | EMC Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test                                                                                                                                                                                          |
| EN 61000-4-5:2006                   | EMC Part 4-5: Testing and measurement techniques - Surge immunity test                                                                                                                                                                                                                    |
| EN 61000-4-6:2009                   | EMC Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields                                                                                                                                                                  |
| EN 61000-4-8:2010                   | EMC Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test. Power frequency magnetic field immunity test: 30 A/m, test criterion A, 100 A/m, test criterion B                                                                                        |
| EN 61000-4-16:2016                  | EMC Part 4-16: Testing and measurement techniques - Test for immunity to conducted, common mode disturbance in the frequency range 0 Hz to 150 kHz                                                                                                                                        |
| EN 61000-4-29:2000                  | EMC Part 4-8: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests                                                                                                                                       |
| IEC 61326-3-2:2018                  | Electrical equipment for measurement, control and laboratory use - EMC requirements Part 3-2: Immunity for safety-related systems and for equipment intended to perform safety related functions (functional safety) - industrial applications with specified electromagnetic environment |

### EXPLOSION-PROOF

Zone 2 and zone 22 ..... Realisation in standard housing with cable output, on demand  
Zone 1 and zone 21 ..... Realisation in explosion-proof housing, additional informations see: [TRX16360](#)

\* These values apply at maximum shaft load. Higher values are achievable at lower loads.

## TECHNICAL DATA

### UL® STANDARDS AND DEFINITIONS (ONLY HARDWARE VERSION 2)

|                               |                                                                                                                                                                                                                                                                          |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRT/S3 certified according to | UL61010-1                                                                                                                                                                                                                                                                |
| UL/CSA certificate number     | E517808                                                                                                                                                                                                                                                                  |
| TRT/S3 installation type      | TYPE 1                                                                                                                                                                                                                                                                   |
| Intended use                  | Indoor use only, dry location. The unit is to be connected only to internal Ethernet networks without exiting a facility and being subjected to TNVs and the communication cables may only be installed inside a building (for UL/CSA Standard only).                    |
| Power supply                  | According to LEC/LPS/Class2 (valid for all TRT/S3 connectors) or SELV using an overcurrent protection (acc. to UL61010), Table 18, ≤8.33 A @ 24VDC                                                                                                                       |
|                               | External circuits intended to be connected to this device shall be galvanic separated from mains supply or hazardous live voltage by reinforced or double insulation and meet the requirements of SELV/PELV - Limited Energy (Class III, LPS) circuit of UL/CSA 61010-1. |

### SAFETY DATA

|                                               |                   |                                                                                                                                                                                             |
|-----------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety values acc. to <b>EN 61508</b>         | PFH               | 9.889 • 10 <sup>-8</sup> 1/h (HW version 1)<br>2.88 • 10 <sup>-8</sup> 1/h (HW version 2, Singleturn)<br>2.92 • 10 <sup>-8</sup> 1/h (HW version 2, Multiturn)                              |
|                                               | SFF               | 92.2 % (HW version 1)<br>97.4 % (HW version 2, Singleturn)<br>97.5 % (HW version 2, Multiturn)                                                                                              |
|                                               | HFT               | 0                                                                                                                                                                                           |
|                                               | SIL               | SIL2                                                                                                                                                                                        |
| Safety values acc. to <b>EN 13849-1</b>       | MTTFd - 20 years  | 162 years (HW version 1)<br>644 years (HW version 2, Singleturn)<br>528 years (HW version 2, Multiturn)                                                                                     |
|                                               | MTTFd - 25 years  | 547 years (HW version 2, Singleturn)<br>449 years (HW version 2, Multiturn)                                                                                                                 |
|                                               | DC                | 86.1 % (HW version 1)<br>91.0 % (HW version 2, Singleturn)<br>91.8 % (HW version 2, Multiturn)                                                                                              |
|                                               | Category          | 2                                                                                                                                                                                           |
|                                               | Performance Level | PLd                                                                                                                                                                                         |
| Max. operating life                           |                   | 20 years (HW version 1, longer operating life on request)<br>20 or 25 years (HW version 2)                                                                                                  |
| Tolerance of the internal position monitoring |                   | 1.5 % (with reference to one revolution) (HW version 1)<br>1.5 % (with reference to one revolution) (HW version 2, smaller values possible with reduction of max. speed. Please contact us) |

### PROGRAMMABLE PARAMETERS

#### CLASS2 (ENCODER PROFILE 1.1)

|                               |                                      |                                                                                                                                                                                       |
|-------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scaling                       | OFF / ON                             |                                                                                                                                                                                       |
| Code path                     | CW / CCW                             | CW (clockwise): ascending values on rotation clockwise<br>CCW (counter clockwise): descending values on rotation clockwise (viewed looking at the shaft)                              |
| Resolution [steps / 360°]     | 1 to 65536* or 4096 (code W)         | Steps per 1 revolution (360°)                                                                                                                                                         |
| Total number of steps [steps] | 1 to 268435456* or 16777216 (code W) | Overall measuring range                                                                                                                                                               |
| Reference value [steps]       | 0 to total number of steps -1        | For adaptation to the application, the position value can be set to any value within the measuring range. Once programmed, a reference value can be set via bit 0 in the control word |
| Gate time [ms]                | 10 to 1000                           | Time basis for speed registration                                                                                                                                                     |

\* Depending on type

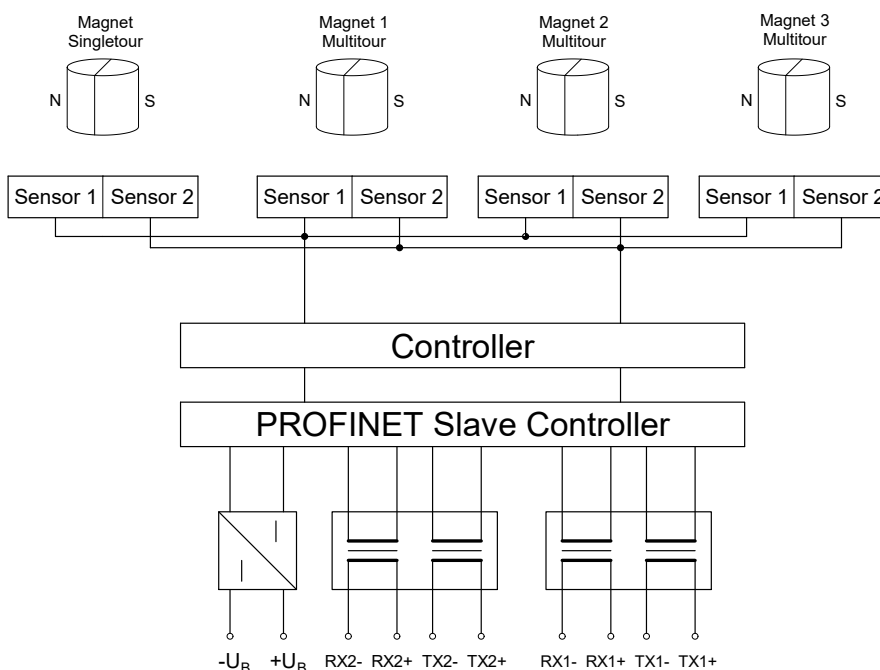
## TECHNICAL DATA

### PROGRAMMABLE PARAMETERS (CONT.)

#### SLEWING RING ENCODER

|                                       |                        |                                                                                                                                                                                                                                                                                                       |
|---------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code path                             | CW / CCW               | CW (clockwise): ascending values on rotation clockwise<br>CCW (counter clockwise): descending values on rotation clockwise (viewed looking at the shaft)                                                                                                                                              |
| Number of teeth slewing ring          | 1 to 65535             | Number of teeth of the machine's slewing ring                                                                                                                                                                                                                                                         |
| Number of teeth encoder pinion        | 1 to 65535             | Number of teeth of the encoder pinion which gears in the slewing ring                                                                                                                                                                                                                                 |
| Resolution position [steps]           | 1 to 65536 x i*        | Desired resolution of the slewing ring position, e.g. 3600 for a resolution of 0,1°. The maximum possible value depends on the gear ratio i*                                                                                                                                                          |
| Resolution for speed calculation [ms] | 1 to 65536 x i*        | The resolution of the slewing ring used for the velocity calculation. This parameter can be adjusted independent of the parameter "Resolution position", e.g. 36000 for a velocity resolution of 0,01° / gate time. The maximum possible value depends on the gear ratio i*                           |
| Gate time [ms]                        | 10 to 1000             | Time basis of the velocity measurement                                                                                                                                                                                                                                                                |
| Reference value [steps]               | 0 to resol. position-1 | To adapt to the users application the encoder can be set to any value within the measuring range. In case of the slewing ring encoder this means 0 to resolution position -1 (= max. value). The preset function is processed via the output data and can be executed in the user programm of the PLC |

### PRINCIPAL CIRCUIT DIAGRAM



\* i = Gear ratio Number of teeth slewing ring to Number of teeth encoder pinion

## ELECTRICAL CONNECTION - PINOUT

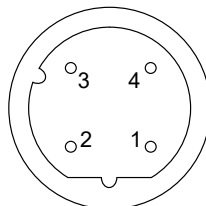
### ELECTRICAL CONNECTION

PROFINET ..... M12 connector D coded, 4 pin, female for port 1 and port 2 or cable output via cable glands  
Power supply ..... M12 connector A coded, 4 pin, male or cable output via cable gland

### PROFINET CONNECTOR, 2 X M12, D-CODED, SOCKET/FEMALE

#### PIN ..... Function

1 ..... TX+  
2 ..... RX+  
3 ..... TX-  
4 ..... RX-



### PROFINET CABLE OUTPUT (2X)

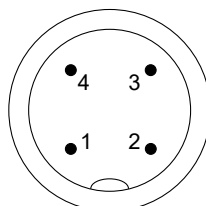
#### Colour\* ..... Function

Yellow ..... TX+  
White ..... RX+  
Orange ..... TX-  
Blue ..... RX-

### SUPPLY CONNECTOR, M12, A-CODED, PINS/MALE OR CABLE OUTPUT VIA CABLE GLAND

#### PIN ..... Function

1 ..... +UB (+24 VDC)  
2 ..... not used  
3 ..... -UB (0 VDC)  
4 ..... not used



### SUPPLY CABLE OUTPUT

#### Colour ..... Function

White ..... +UB (+24 VDC)  
Brown ..... -UB (0 VDC)

Cables for UL® certified systems ..... Only CYJV/PVVA cables should be used for the connection. Please use only cables with a cross-section of at least AWG22 and maximum temperature load (min. 90°C), minimum rating 60 VDC, 1 A.

### CABLE OUTLET PROFINET (OPTIONAL)

Cable type ..... PROFINET Type-C, 4 x 0.36 mm² (AWG22)  
Cable jacket ..... PUR, color: green  
Temperature range ..... - 40 °C to + 70 °C  
Outer diameter ..... 6.5 mm ± 0.2 mm  
Min. bend radius ..... 5 x d fixed installation, 10 x d freely movable

### CABLE OUTLET POWER SUPPLY (OPTIONAL)

Cable type ..... 2 x 0.75 mm², shielded  
Cable jacket ..... PUR, color: gray  
Temperature range ..... - 40 °C to + 80 °C fixed installation, - 5 °C to + 70 °C freely movable  
Outer diameter ..... 6 mm  
Min. bend radius ..... 6 x d fixed installation, 15 x d freely movable

\* Industrial Ethernet cable colours according to ISO/IEC 8802-3

# ORDER CODE FORMAT

**TRT**    **58 - KP**    **A**    **65536**    **D**    **4096**    **S3**    **M**    **T**    **01**    **STANDARD VERSION**

| TRT            | TRT Absolute encoder with Profisafe/Profinet interface |          |                                                                                                                                          |
|----------------|--------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>58 - KP</b> | Design form (Ø),<br>flange and shaft                   | 58 - K   | Clamped flange, shaft 10 mm with flattened area                                                                                          |
|                |                                                        | 58 - KF  | Clamped flange, shaft 10 mm with woodruff key                                                                                            |
|                |                                                        | 58 - KP  | Clamped flange, shaft 10 mm with parallel key (recommended)                                                                              |
|                |                                                        | 58 - KZ  | Clamped flange, shaft for play-compensating toothed gear ZRS                                                                             |
|                |                                                        | 58 - SN  | Synchro flange, clamping shaft 12 mm with groove for parallel key                                                                        |
|                |                                                        | 58 - ST  | Synchro flange, clamping shaft 6 mm with flattened area                                                                                  |
|                |                                                        | 64 - HP  | Heavy duty flange for shaft loads up to 500 N, shaft 10 mm with parallel key                                                             |
|                |                                                        | 64 - NZ  | Cam switch flange, shaft for play-compensating toothed gear ZRS                                                                          |
|                |                                                        | 65 - SP  | Synchro flange, shaft 12 mm with parallel key                                                                                            |
|                |                                                        | 66 - K   | Clamped flange, shaft 10 mm with flattened area                                                                                          |
|                |                                                        | 66 - KP  | Clamped flange, shaft 10 mm with parallel key                                                                                            |
|                |                                                        | 78 - KP  | Ex housing for zone 1/21, clamped flange, shaft 10 mm with parallel key                                                                  |
|                |                                                        | 78 - SP  | Ex housing for zone 1/21, synchro flange, shaft 10 mm with parallel key                                                                  |
|                |                                                        | 78 - VP  | Ex housing for zone 1/21, square flange, shaft 10 mm with parallel key                                                                   |
|                |                                                        | 105 - MP | Mounting flange, shaft 12 mm with parallel key                                                                                           |
| <b>A</b>       | Housing material                                       | A        | Aluminium 3.2315 (AlMgSi1)                                                                                                               |
|                |                                                        | B        | Burnished steel for shielding strong magnetic fields                                                                                     |
|                |                                                        | S        | Stainless steel 1.4305 (AISI 303)                                                                                                        |
|                |                                                        | V        | Stainless steel 1.4404 (AISI 316L)                                                                                                       |
|                |                                                        | W        | resp. 1.4401 (AISI 316) for design form 78<br>Stainless steel 1.4521 for shielding strong magnetic fields                                |
| <b>65536</b>   | Resolution in<br>steps/360°                            | 4096     | 12 bit                                                                                                                                   |
|                |                                                        | 8192     | 13 bit                                                                                                                                   |
|                |                                                        | 65536    | 16 bit                                                                                                                                   |
| <b>D</b>       | Code                                                   | R        | Binary code, position value divided into two words                                                                                       |
|                |                                                        | W        | Binary code, position value divided into two words with<br>1. word multiturn data,<br>2. word singleturn data, resolution not adjustable |
|                |                                                        | D        | Binary code, position as double word<br>(e.g. for Simatic TIA Portal with Safety Advance)                                                |
|                |                                                        | S        | Binary code, slewing ring function                                                                                                       |
| <b>4096</b>    | Measuring range                                        | 4096     | Number of revolutions (Single turn version: leave blank)                                                                                 |
| <b>S3</b>      | Profile                                                | S1       | Safety design not certified (samples)                                                                                                    |
|                |                                                        | S3       | SIL2/PLd certified according to this data sheet                                                                                          |
| <b>M</b>       | Electrical<br>connection                               | M        | 3 connectors radial                                                                                                                      |
|                |                                                        | Mx       | Connector output radial (x = number of connectors**)                                                                                     |
|                |                                                        | Ky       | Cable output radial (y = cable length, e.g. 2 or 0,54),<br>(for EX-protection only cable output possible)                                |
|                |                                                        | T        | 3 connectors axial (T: possible & standard at HW version 2)                                                                              |
| <b>T</b>       | Output                                                 | Tx       | Connector output axial (x = number of connectors**)                                                                                      |
|                |                                                        | T        | PROFINET 100Base-TX                                                                                                                      |
| <b>01</b>      | Electrical and<br>mechanical variants*                 | 01       | Standard                                                                                                                                 |

\* The basic versions according to the data sheet bear the number 01. Deviations are identified with a variant number and are documented at TWK.

\*\* Number of outputs: 1 = Hybrid, 2 = 1x power supply, 1x PROFINET, (don't fill in: 3 = 1x power supply, 2x PROFINET)



## ACCESSORIES (SELECTION)

### MATING CONNECTORS

| Order number, Datasheet                        | Type                    | Design & wire fixing | Housing-material               | Cable ø & wire size                       | Shielding & IP grade |
|------------------------------------------------|-------------------------|----------------------|--------------------------------|-------------------------------------------|----------------------|
| <b>STK4GP81</b> ,<br><a href="#">STK14570</a>  | M12-D<br>4-pole, male   | Straight,<br>screws  | Zinc die-cast<br>nickel-plated | 5 – 8 mm<br>≤ 0.75 mm <sup>2</sup>        | On housing<br>IP67   |
| <b>STK4GP110</b> ,<br><a href="#">STK14569</a> | M12-D<br>4-pole, male   | Straight,<br>screws  | Stainless<br>steel 1.4404      | 5.5 – 8.6 mm<br>≤ 0.75 mm <sup>2</sup>    | On housing<br>IP67   |
| <b>STK4GS60</b> ,<br><a href="#">STK14572</a>  | M12-D<br>4-pole, male   | Straight,<br>screws  | Zinc die-cast<br>nickel-plated | 5.5 – 8.6 mm<br>≤ 0.75 mm <sup>2</sup>    | On housing<br>IP67   |
| <b>STK4GS104</b> ,<br><a href="#">STK14571</a> | M12-A<br>4-pole, female | Straight,<br>screws  | Stainless<br>steel 1.4404      | 5.5 – 8.6 mm<br>≤ 0.75 mm <sup>2</sup>    | On housing<br>IP67   |
| <b>STK4WP116</b> ,<br><a href="#">STK15518</a> | M12-D<br>4-pole, male   | Angled,<br>IDC       | Zinc die-cast<br>nickel-plated | 4 – 8 mm<br>ø 1 – 1.6 mm <sup>2</sup>     | On housing<br>IP67   |
| <b>STK4WS117</b> ,<br><a href="#">STK16392</a> | M12-A<br>4-pole, female | Angled,<br>PLC       | Zinc die-cast<br>nickel-plated | 4 – 8 mm<br>ø 0.14 – 0.75 mm <sup>2</sup> | On housing<br>IP67   |

### CONNECTING CABLE - PROFINET

**KABEL-x-114** . . . . . Industrial Ethernet data cable with M12 connectors, D-coded, moulded on at both ends.  
x = length in meters, standard lengths: 1, 2, 3, 5, 10, 15 and 20 m, see datasheet [KBL14673](#)

**KABEL-x-118** . . . . . Industrial Ethernet data cable with M12 connector to RJ 45, IP 20.  
x = length in meters, standard lengths: 2, 3, 5, 10, 15 and 25 m, see datasheet [KBL14655](#)

### CONNECTING CABLE - POWER SUPPLY

**KABEL-x-191** . . . . . Power supply cable with moulded M12 connectors A coded straight, 2. side open.  
x = length in meters, standard lengths: 2, 5, 10, 15, 20 and 25 m, see datasheet [KBL13411](#)

### SHAFT COUPLINGS

**BKK** . . . . . Bellows coupling, large, see datasheet [BKK11840](#)  
**BKM** . . . . . Bellows coupling, small, see datasheet [BKM11995](#)  
**KK14** . . . . . Clamp coupling, see datasheet [KK12301](#)

### TOOTHED GEARS

**ZRS** . . . . . Play-compensating toothed gear, see datasheet [ZRS11877](#)  
**ZRM** . . . . . Standard toothed gear, see datasheet [ZRM13229](#)

### STATOR COUPLING / TORQUE SUPPORT

**ZMS** . . . . . See datasheet [ZMS12939](#)

### GENERAL MECHANICAL ACCESSORIES

**Syn. clamps** etc. . . . . See datasheet [MZ10111](#).



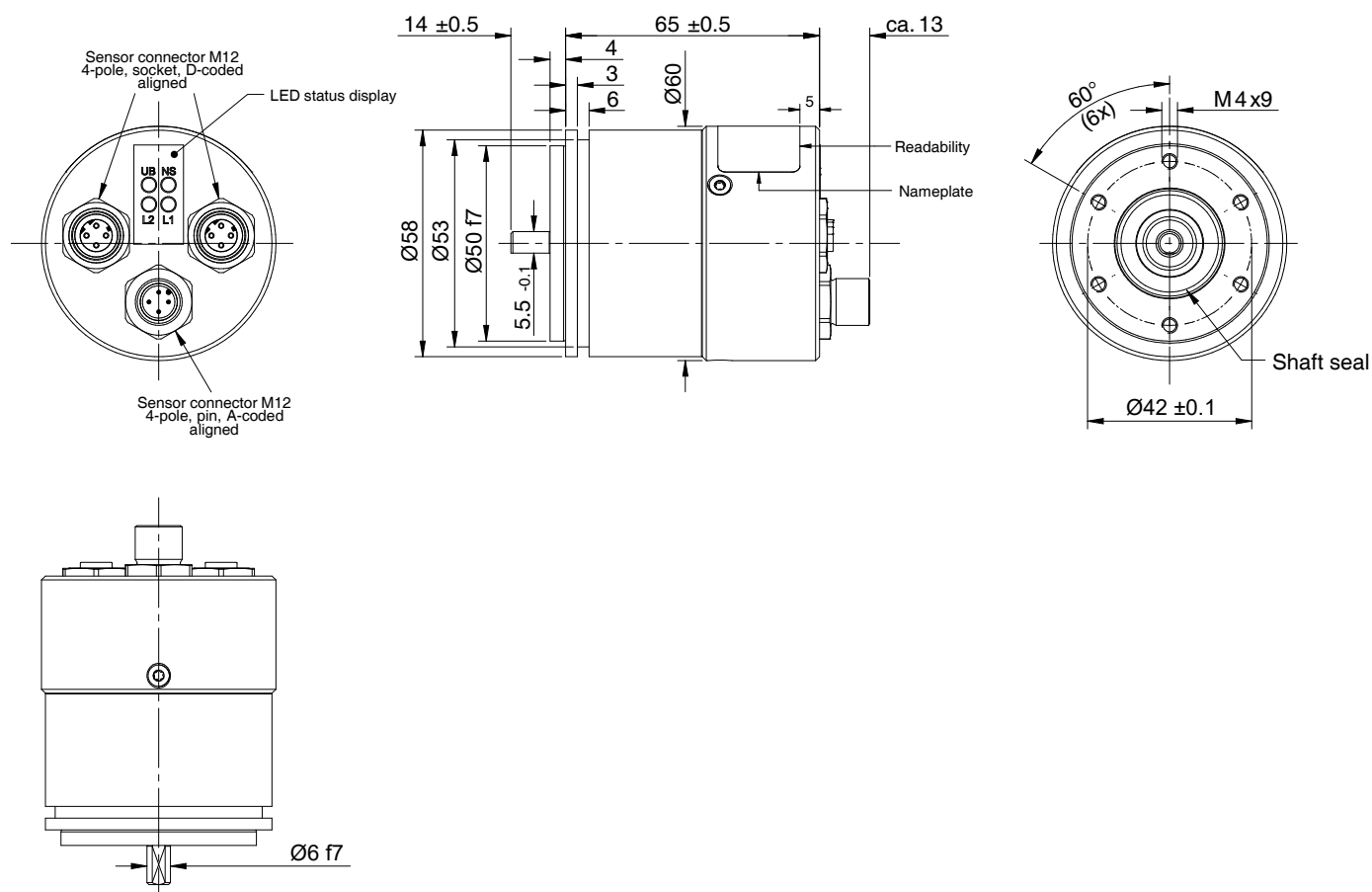


## INSTALLATION DRAWINGS

### DESIGN FORM 58 WITH SYNCHRONISER FLANGE, ORDER NUMBER: TRT58-STA65536R4096S3TT01

Shaft  $\varnothing$  6 mm with flat

Dimensions in mm



## NOTE

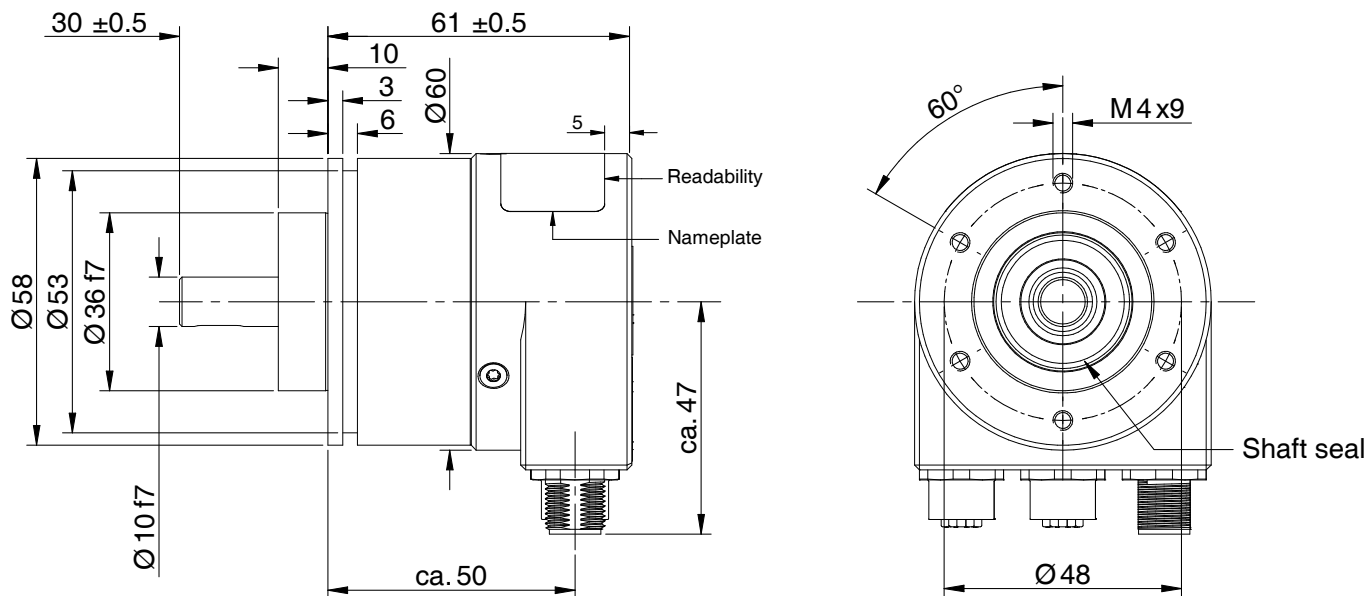
The singleturn version is about 15 mm shorter!

## INSTALLATION DRAWINGS

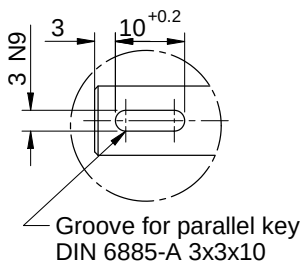
### DESIGN FORM 58 WITH CLAMPED FLANGE, ORDER NO. TRT58-KPA65536D4096S3MT01 - STANDARD VERSION

Shaft  $\varnothing$  10 mm, with parallel key

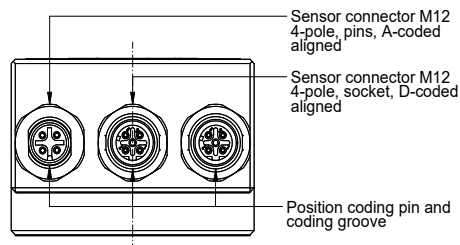
Dimensions in mm



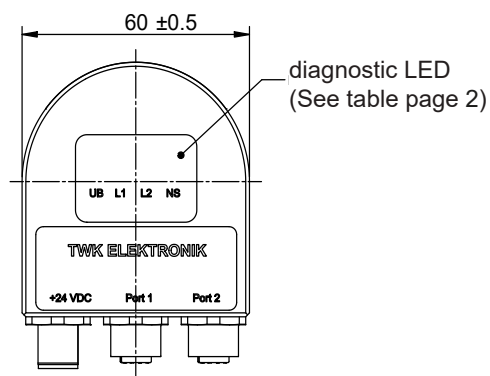
### SHAFT $\varnothing$ 10 MM WITH GROOVE AND PARALLEL KEY



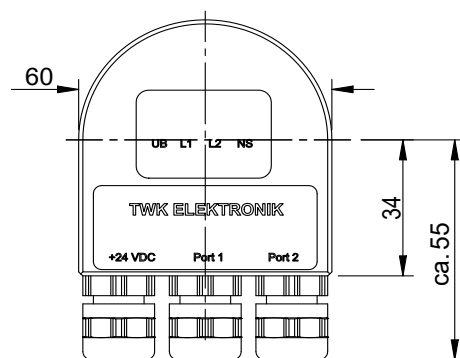
### CONNECTOR VIEW WITH M12-CONNECTOR



### REAR VIEW WITH M12 CONNECTORS



### REAR VIEW WITH CABLE OUTPUT



### NOTE

The singleturn version is about 15 mm shorter!

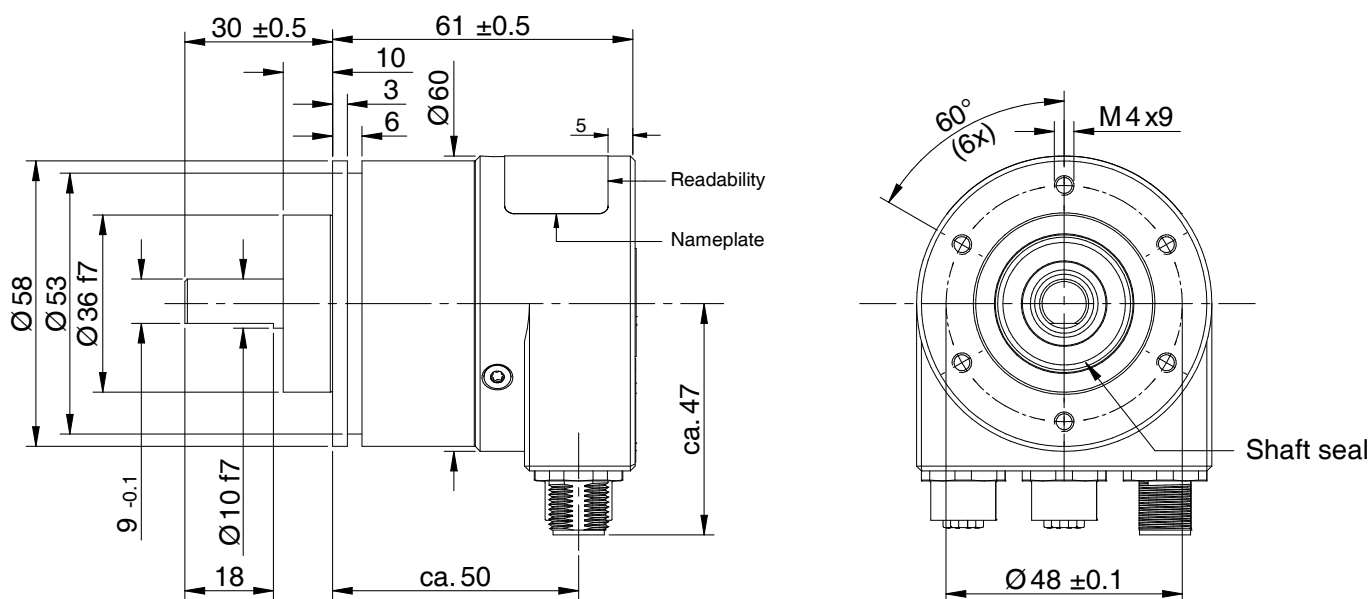
The connectors of the stainless steel version are not aligned.

## INSTALLATION DRAWINGS

### DESIGN FORM 58 WITH CLAMPED FLANGE, ORDER NUMBER: TRT58-KA65536R4096S3MT01

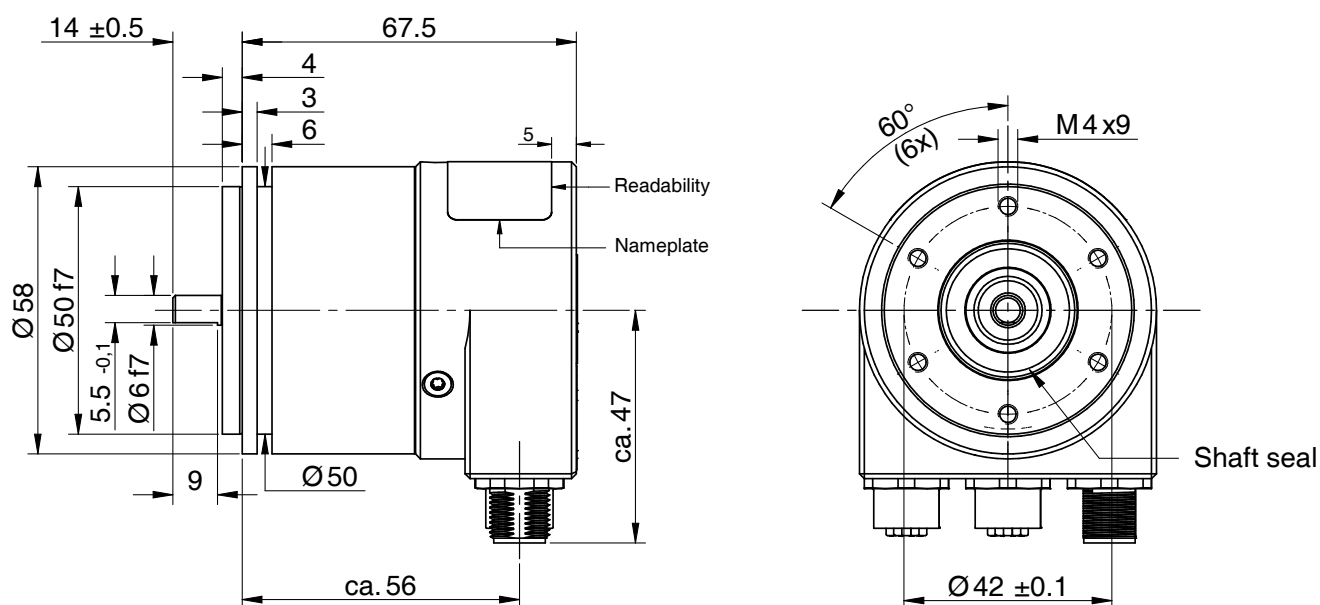
Shaft  $\varnothing$  10 mm with flat

Dimensions in mm



### DESIGN FORM 58 WITH SYNCHRONISER FLANGE, ORDER NUMBER: TRT58-STA65536R4096S3MT01

Shaft  $\varnothing$  6 mm with flat



## NOTE

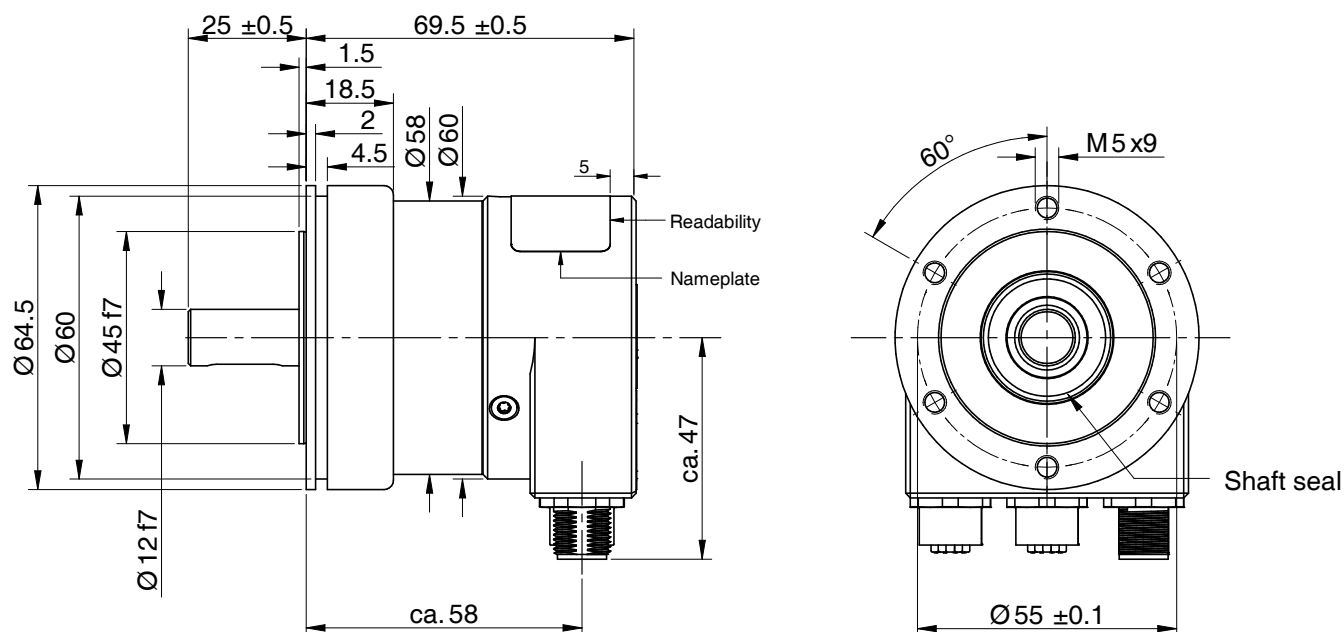
The singleturn version is about 15 mm shorter!

## INSTALLATION DRAWINGS

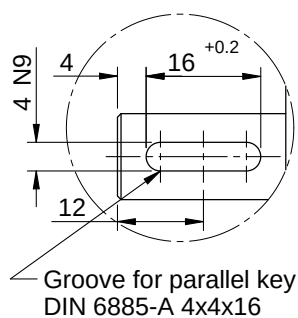
### DESIGN FORM 65 WITH SYNCHRONISER FLANGE, ORDER NUMBER: TRT65-SPA65536R4096S3MT01

Shaft  $\varnothing$  12 mm, with parallel key

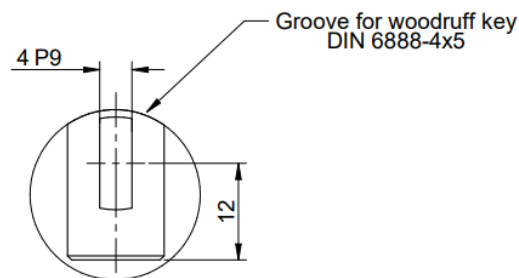
Dimensions in mm



### SHAFT $\varnothing$ 12 MM, WITH GROOVE AND PARALLEL KEY



### SHAFT $\varnothing$ 12 MM, WITH GROOVE AND WOODRUFF KEY



### NOTE:

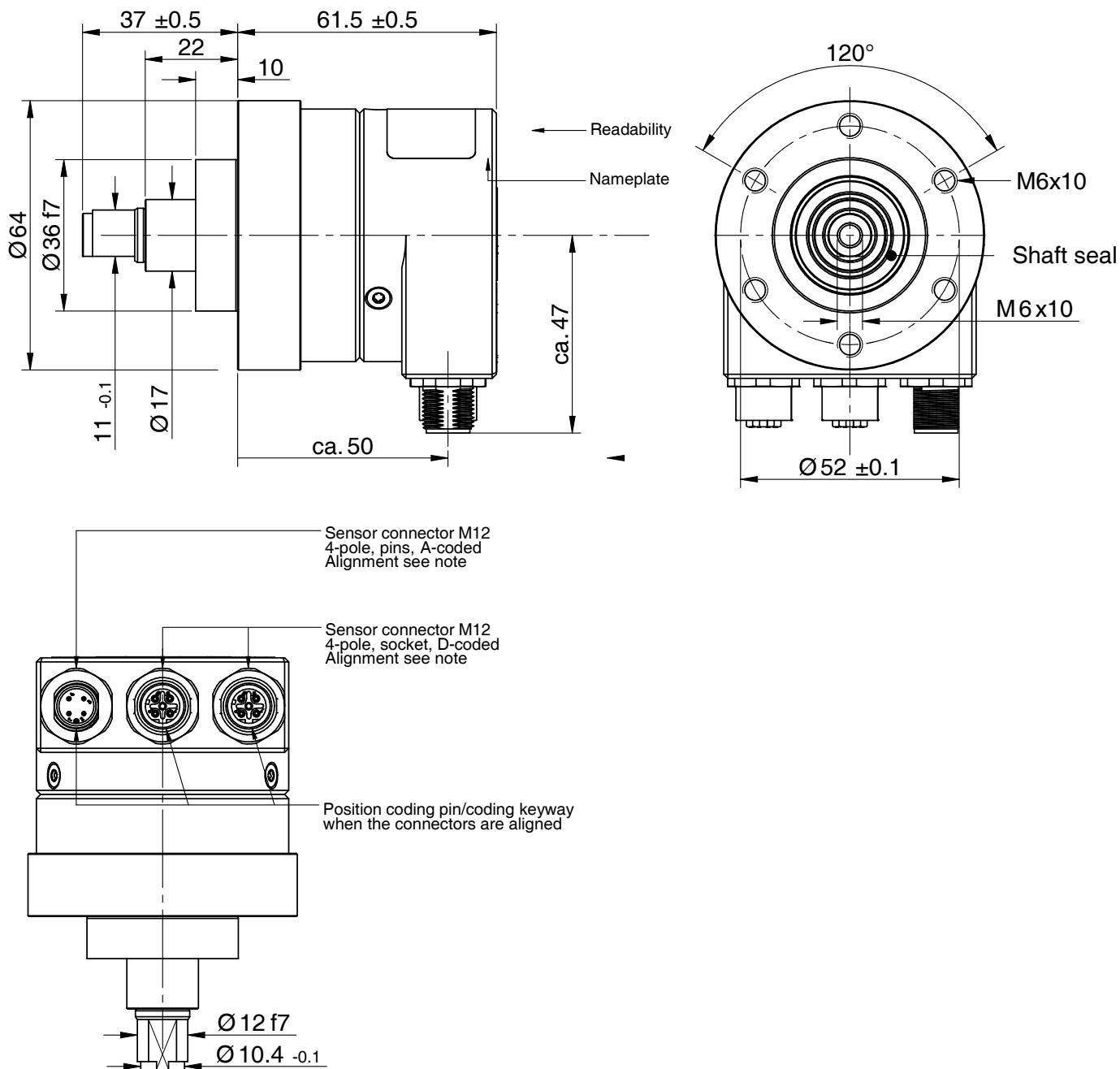
The singleturn version is about 15 mm shorter!

## INSTALLATION DRAWINGS

### DESIGN FORM 64 WITH SWITCHING CAM ENCODER FLANGE, ORDER NUMBER: TRT64-NZA65536R4096S3MT01

Shaft  $\varnothing$  12 mm with flattened area, for mounting the toothed gear

Dimensions in mm



### NOTE

The singleturn version is about 15 mm shorter!

The connectors of the stainless steel version are not aligned.



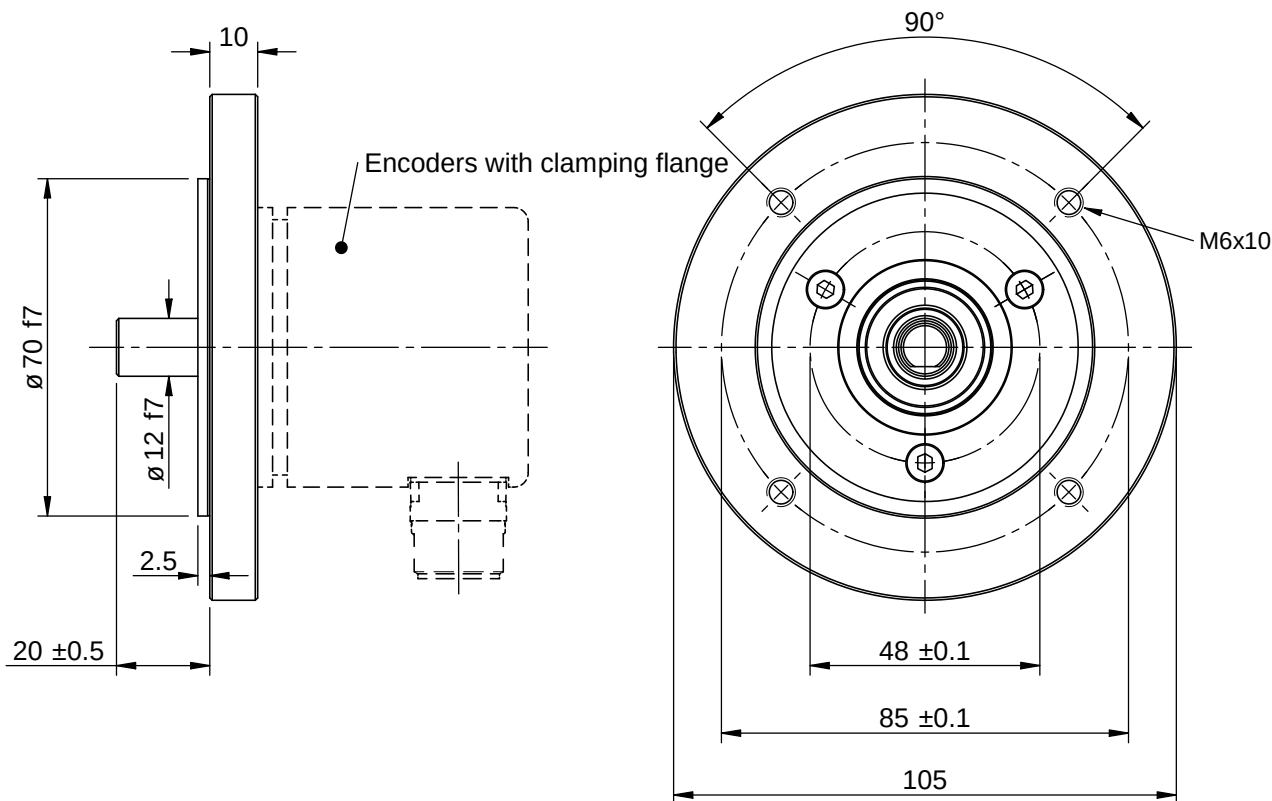


## INSTALLATION DRAWINGS

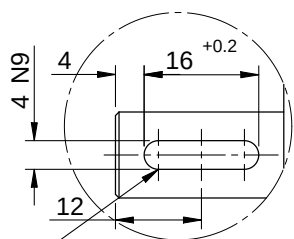
### DESIGN FORM 105, ORDER NUMBER: TRT105-MPA65536R4096S3MT01

Shaft  $\varnothing$  12 mm, with parallel key

Dimensions in mm



### SHAFT $\varnothing$ 12 MM WITH GROOVE AND PARALLEL KEY



Groove for parallel key  
DIN 6885-A 4x4x16

### DESIGN FORM 78, EXPLOSION-PROOF HOUSING

See [TRX16360](#)