TBN/TMN/TRN - ABSOLUTE ROTARY ENCODER

INTERFACE:
CANOPEN SAFETY / CANOPEN

FEATURES

- Absolute Single-turn/Multi-turn shaft encoder

- Many Variants available

  - ▹ Sturdy design for rough applications
  - ▹ Miniature version
  - ▹ Bearingless "Kit Encoder" version with external magnet

- Measuring range

  - ▹ TBN: max. 65,536 steps/360°
  - ▹ TMN: max. 65,536 steps/rev. x 262,144 revolutions
  - ▹ TRN: max. 65,536 steps/rev. x 4096 revolutions

- Protection grade IP65/IP66 (IP68/ IP69K optional)

- Interfaces

  - ▹ CANopen Safety SIL2
  - ▹ CANopen (CiA DS 406 Encoder Profile, 4.1.0)

- ATEX Variants for use in zone 1/21 and 2/22

KEY INFORMATION OVERVIEW

DESIGN & FUNCTION

- Sturdy housing made from seawater-resistant aluminium, austentic steel (V2A or V4A) or ferritic standard and chrome steel (for high requirements of interference resistance against magnetic fields).

- Constructions with Ø 42, Ø 53, Ø 58, Ø 78mm as well as special constructions (application-dependent).

- Redundant magnetic sensor systems for position detection.

- Recording of rotations via an absolute Multi-turn transmission in the TRN model.

- Recording of the revolutions by means of an electronic counter on the TMN model.

- Electrical connections via connector M12x1 (Bus In and Bus Out option) or via cable.

- Optional housing potting to meet IP68/ IP69K requirements.

- Interface as CANopen Safety SIL2 in accordance with IEC 61508.

A positive-locking mechanical connection between the customer's shaft and the sensor shaft ensures that the magnet in the sensor shaft precisely reflects the rotation of the customer's shaft.

Safe operation is also possible in the bearingless version thanks to existing diagnostic functions.

FEATURES INTERFACE

With the TBN model, one rotation (max. 65,536 steps) is recorded.

With the subsequent absolute transmission, the TRN shaft encoder reaches a measuring range of up to 4096 rotations.

With the CANopen Safety protocol, both the position value and the speed value (SRDO - Safety Relevant Data Object) meet the requirements of SIL2.

With an electronic counter, the TMN encoder achieves a measuring range of 32,768 revolutions while being supplied with power.

The values for the redundant system are compared and checked for plausibility. If the check is positive, the output will be normal and bit-inverted.

Comprehensive checks using CRC, timing monitoring, voltage monitoring etc., ensure that reliable position and speed values are output. The speed value can be parameterized via the gate time (1 to 1000 ms) depending on the specific application.

In the event of a fault, emergency protocols are issued and a fault listing is created. The target function here is to move to a safe state in the event of a fault. This is also referred to as the functional safety of the encoder.

Additionally position and speed values (PDO - Process Data Object) can be output via the CANopen standard protocol.

TECHNICAL DATA

ELECTRICAL DATA / RELATED TO THE NODE

Sensor system . . . . Magnetic sensor system
Operating voltage . . . . 9 to 36 VDC with reverse-polarity protection and short-circuit protection
Power consumption . . . . TBN/TMN: < 1 W
 TRN: < 1.5 W
Resolution / Total step count . . . . TBN: max. 65,536 steps, 16 Bit (steps/360°)

TMN: max. 17,179,869,184 steps, 16 Bit single-turn (65,536 steps/revolution) x 18 bit multi-turn (262,144 revolutions)

TRN: max. 268,435,456 steps, 16 Bit single-turn (65,536 steps/revolution) x 12 Bit multi-turn (4096 revolutions)

Speed value . . . . In addition to the position signal, a digits/gate time speed signal is also generated, which can be configured by the customer via an adjustable gate time, multiplier and divider for the application.

▹ Speed value data format	16 Bit (signed)
▹ Gate time	1 to 1000 ms
▹ Internal sampling frequency	1ms
▹ Maximum speed	15,000 rpm (mechanical limit, see: mechanical data)

Code sense . . . . CW* or CCW**, parameterizable
Reference value . . . . 0 to (total step count -1)
Accuracy TBN/TMN . . . . ≤ ± 0.05 % (please contact us for bearingless encoders)
Accuracy TRN . . . . ≤ ± 0.2 %
Reproducibility . . . . ≤ ± 0.02 %
Temperature drift . . . . ≤ 0.02°/K

CANOPEN SPECIFICATION OVERVIEW (WWW.CAN-CIA.ORG)

CiA DS301 . . . . CANopen Application Layer and Communication Profile, Version 4.2.0
CiA DS406 . . . . CANopen - Device Profile for Encoders, Version 4.1.0
CiA DS305 . . . . CANopen - Layer Setting Services and Protocol (LSS)
DIN EN 50325-5: 2016-06 . . . . 2016-06 Industrial communication sub-system based on ISO 11898 (CAN) - Part 5: Functionally safe communication based on EN 50325-4.
CAN-Interface . . . . according to ISO/DIS 11898
Address setting . . . . over LMT/LSS or SDO
Terminating resistance . . . . to be implemented separately (optionally: circuit board mounted)
Max. transmission length . . . . 30 m
Bootloader function . . . . yes
 System prerequisites:
 • PCAN-USB adapter (www.peak-system.com) including USB cable for PCconnection
 • CANopen tester EPC software, hex file for updating
 • encoder connecting cable
Number of PDOs . . . . 2 Tx
Number of SRDOs . . . . 2 Tx (CANopen Safety SIL2)
PDO-Modes . . . . sync, async, cyclic, acyclic
SRDO-Mode . . . . cyclic (CANopen Safety SIL2)
Variable PDO-Mapping . . . . yes
Emergency Message . . . . yes
Heartbeat . . . . yes
No. of SDOs: . . . . 1 Rx/1 Tx
Device Profile . . . . CiA DSP 406 Version 4.1.0

The profile details are described in detail in the user manual TXN/TXSN15469. The CRC calculation is carried out using the CRC-Calculator program, which can be provided to the customer on request.

* CW = increasing output value when shaft rotating clockwise

** CCW = increasing output value when shaft rotating counter-clockwise

TECHNICAL DATA

SYSTEM AND SAFETY

Duty cycle (rise time) supply voltage . . . . 500 ms (10 % to 90 %)
Information density . . . . up to 10,000 messages/s
Storage cycle time . . . . 3s per memory cycle
Setup Time . . . . ~ 2s @ T ≥ +20 °C
Time between the detection of a fault and
the output of the emergency message . . . . 100 ms (voltage supply)
                                                   5s (RAM test, all individual bits ok)
                                                   2s (ROM test (within setup time))
Safety standard . . . . IEC 61508: 2017: Functional Safety of Electrical/Electronic/Programmable
                                                   Electronic Safety-related Systems
EDS file . . . . The EDS file is available on request

MECHANICAL DATA

Operating speed . . . . max. 1000 RPM (with shaft sealing ring)
                                                   max. 15000 RPM (with Nilos ring/ bearingless)
Angular acceleration . . . . 10^5 rad/s^2 max.
Moment of inertia (rotor) . . . . 0.11 oz-in^2 (Ø ≥ 50 - design form with integrated bearing)
                                                   5.47×10^{-3} oz-in^2 (Ø 42 - design form with integrated bearing)
Operating torque . . . . ≤ 8 Ncm (design form with integrated bearing)
Starting torque . . . . ≤ 3 Ncm (design form with integrated bearing)
Permissible shaft load . . . . Ø ≥ 50 - design form with integrated bearing
                                         . . . . 250 N axial, 250 N radial
                                         Ø 42 design form with integrated bearing
                                         . . . . 50 N axial, 50 N radial - standard, higher values optional
Bearing service life . . . . ≥ 10^9 rotations* (for design form with integrated bearing))
Mass . . . . TBN Ø 58: Aluminium approx. 0.3 kg, Steel approx. 0.4 kg
                                          TRN Ø 58: Aluminium approx. 0.5 kg, Steel approx. 0.7 kg
                                          TRN Ø 42: Aluminium approx. 0.3 kg, Stainless steel approx. 0.35 kg
                                          Weight specifications for the other constructions and bearingless designs on request.

ENVIRONMENTAL DATA

Working temperature range . . . . - 40 °C to + 82 °C (Ø 78 for ATEX Zone 1/21, - 40 °C to + 70 °C)
Storage temperature range . . . . - 20 °C to + 60 °C (due to packaging)
Resistance . . . . To shock . . . . 25g @ 6ms duration, je 100 x in 3 axes every 100x (higher values
                                                                  optional)
                                                                  DIN EN 60068-2-27
                                         To vibration . . . . . 10g @ 5 to 2000 Hz, in 1 h in 3 axes, (higher values optional)
                                                                  DIN EN 60068-2-6
Protection grade (DIN EN 60529) . . . . Shaft side: IP66/ IP67 - shaft sealing ring, IP65 - Nilos ring
                                          (For higher degrees of protection up to IP68/ IP69K, please contact our technical
                                          contact persons)

* This value applies for maximum shaft load

TECHNICAL DATA

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 (±16 digit), 100 A/m, test criterion B
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

SAFETY DATA TBN

Service life . . . . 20 years
HFT . . . . 0 . . . . Hardware fault tolerance
SFF . . . . 96.23% . . . . Safe failure fraction
DC . . . . 92.64% . . . . Diagnostic Coverage
PFH . . . . 6.48003 $\times 10^{-8}$ h . . . . . Probability of dangerous Failure per hour

SAFETY DATA TRN

Service life . . . . 20 years
HFT . . . . 0 . . . . Hardware fault tolerance
SFF . . . . 96.27% . . . . Safe failure fraction
DC . . . . 92.95% . . . . Diagnostic Coverage
PFH . . . . 7.69932 $\times 10^{-8}$ h . . . . . Probability of dangerous Failure per hour

SAFETY DATA TMN

To be determined

TECHNICAL DATA

BUS CONNECTION AS PER ISO/DIS 11898

* Termination resistance
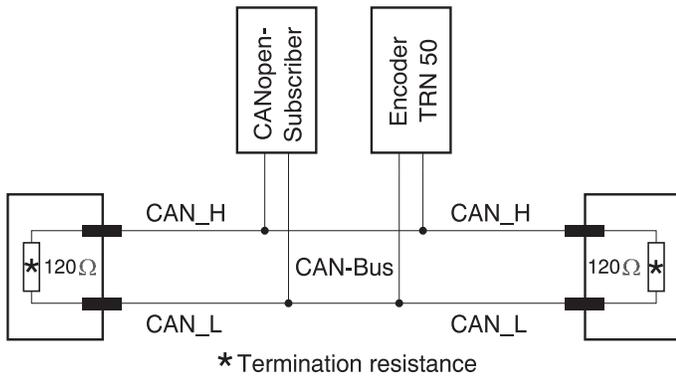
OUTPUT LEVEL AS PER ISO/DIS 11898

1) at Common-Mode-Voltage = 0 V
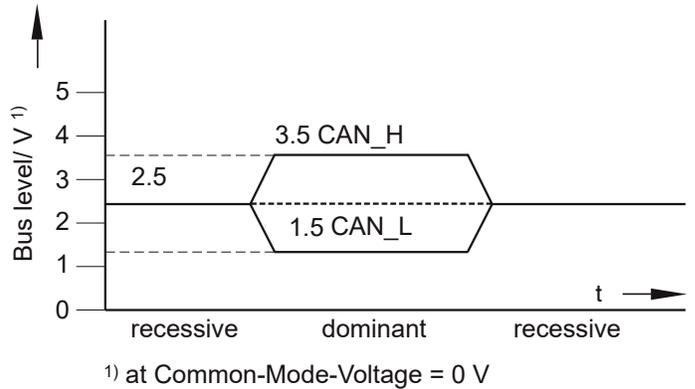
DATA PROFILE CANOPEN

PDO1/2 (position and speed)

PDO 1 / PDO 2
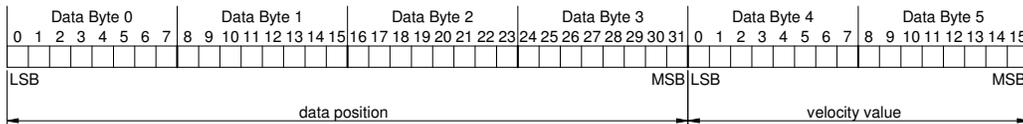
DATA PROFILE CANOPEN SAFETY SIL2

SRDO1 (safety position) – normal and bit-inverted

SRDO 1
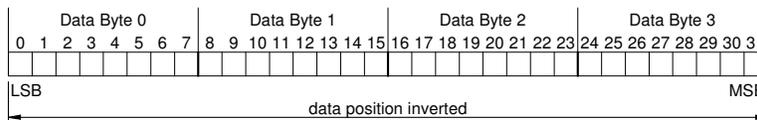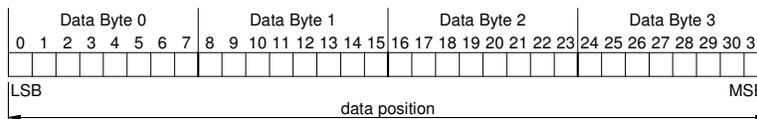
DATA PROFILE CANOPEN SAFETY SIL2

SRDO2 (safety position) – normal and bit-inverted

SRDO 2
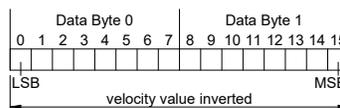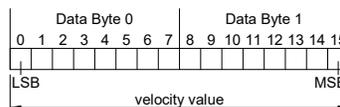
TECHNICAL DATA

PRINCIPAL CIRCUIT DIAGRAM TBN/ TMN AND TRN (CANOPEN SAFETY SHOWN)

MODEL: TBN/TMN...S4...SAFETY
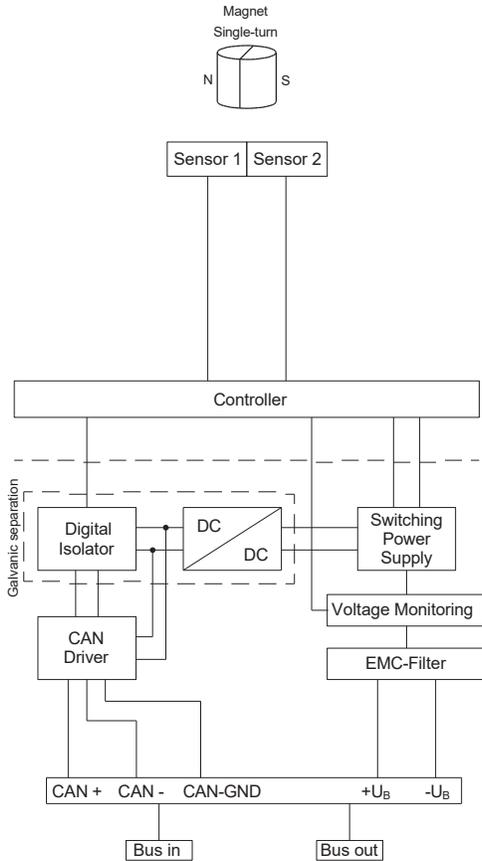
MODEL: TRN...S4...SAFETY
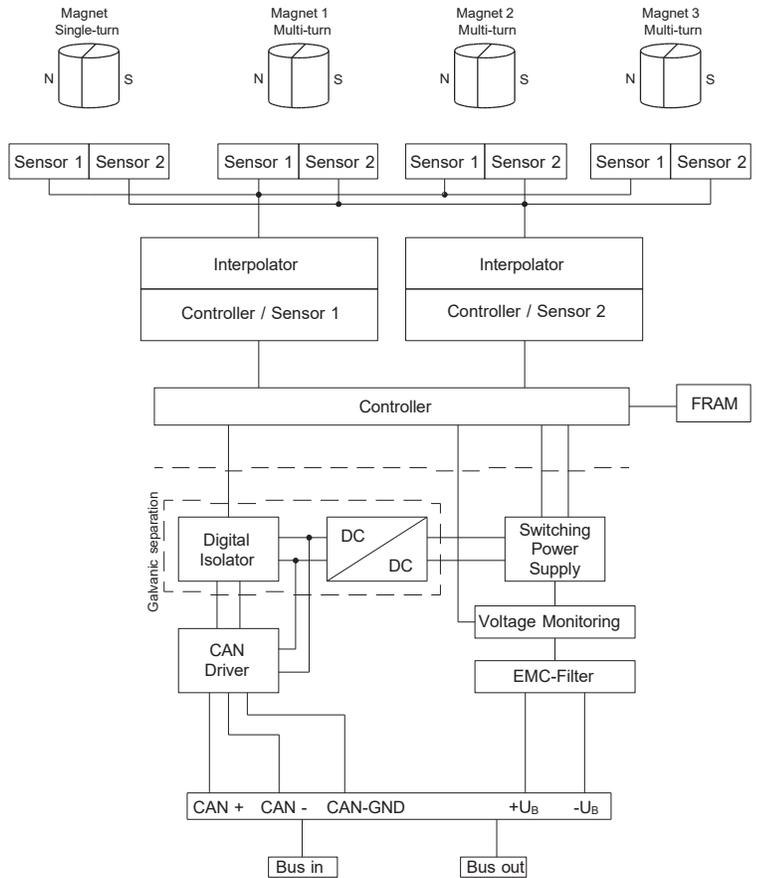
TECHNICAL DATA

SLEWING RING SOFTWARE 'S' FOR TRN SAFETY ENCODER

For applications in wind turbines, cranes, transport units, etc., it is desirable to emulate the function of a mechanical gearbox. For example, if the rotary encoder is coupled to the drive axle of a gearbox or if the position of a slewing ring is to be detected using a measuring gear with coupled rotary encoder.

Software version 'S' provides this function. The encoder is located on the fast gear axis (drive wheel) and calculates the position of the slow gear axis (output wheel) via the transmission ratio. The transmission ratio and the resolution of the output axis (digit per revolution) can be freely selected. The output code is consistent beyond the code range of the encoder, regardless of the selected transmission ratio. The transmission ratio can be even or odd.

The user does not have to evaluate the gear revolutions and can run through any number of gear periods in one direction. This means that non-reversing operation is possible.

The slew ring software manages a global offset secured by a CRC algorithm, which ensures that a full gear period is always available, even at the end of the encoder's code range. For the correct function of the module, the encoder may only be rotated a pre-determined number of revolutions (1024 to 2047 revolutions in each direction by default depending on the gear ratio) in a de-energized state Please see Handbook TXN/TXSN15469 for further details, especially "Safety Notes to slewing ring functionality for "(safety_)gear_configuration".

ENCODER OUTPUT

The output resolution can be customer specific ex-works or parameterized by the customer with the " (safety_)gear_configuration"CANopen Objects. Depending on the gear ratio different resolutions e.g. 1/100° (36000 steps/360° slewing ring rotation) or 1/1000° (360000 steps/360° slewing ring rotation) can be parameterized. For further details please refer to Handbook TXN/TXSN15469.

value (for 36000 steps/360° of the slewing ring): 8738 [decimal]

current slewing ring position: 87.38°

0° - Preset Position
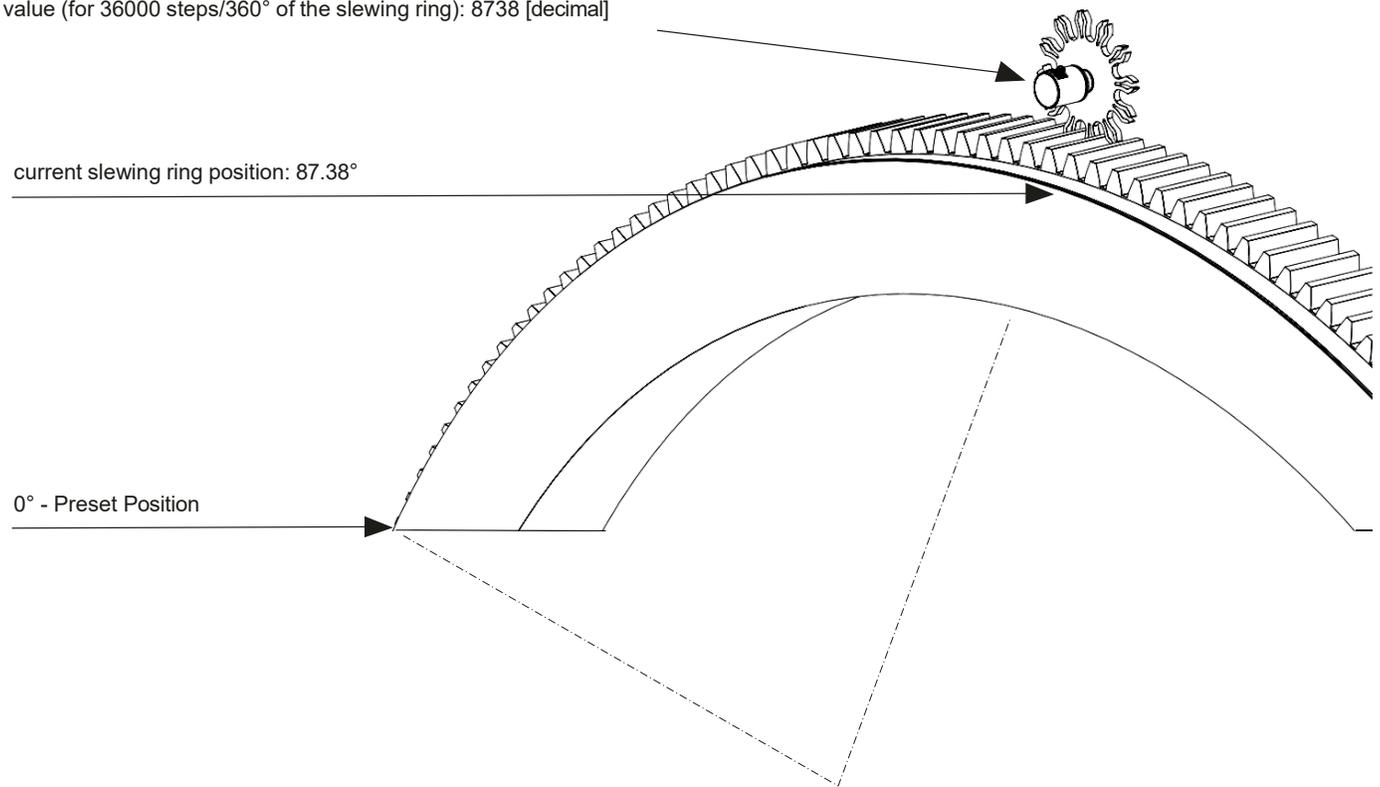
ELECTRICAL CONNECTION - PIN CONFIGURATION

ELECTRICAL CONNECTION

- TBN Ø 58 / TRN Ø 58

  ▹ With connector M12x1, pin, 5-pin, A-coded
  ▹ With 2 connectors M12x1, pin and socket, 5-pin, A-coded, Bus In and Bus Out
  ▹ With 2 connectors M12x1, pin and socket, 5-pin, A-coded, Bus In and Bus Out

- For Ø 42, 53, 78 cable outlet, see drawings at the end of this document

- The connection assignment TYxxxxx is part of the scope of supply and is included with each device.
  In order to reduce unnecessary paper consumption, this can be omitted for standard devices after consultation.

PIN DIAGRAM M12X1, 5-PIN, VIEW OF PLUG-IN SIDE AND ORIENTATION (STANDARD)

Socket, 5-pin, A-coded
Plug-in side

Pins, 5-pin, A-coded
Plug-in side

Sensor connector M12 5-pole,
pins, A-coded aligned

Sensor connector M12
5-pole, socket, A-coded
aligned

Position coding pin/coding keyway
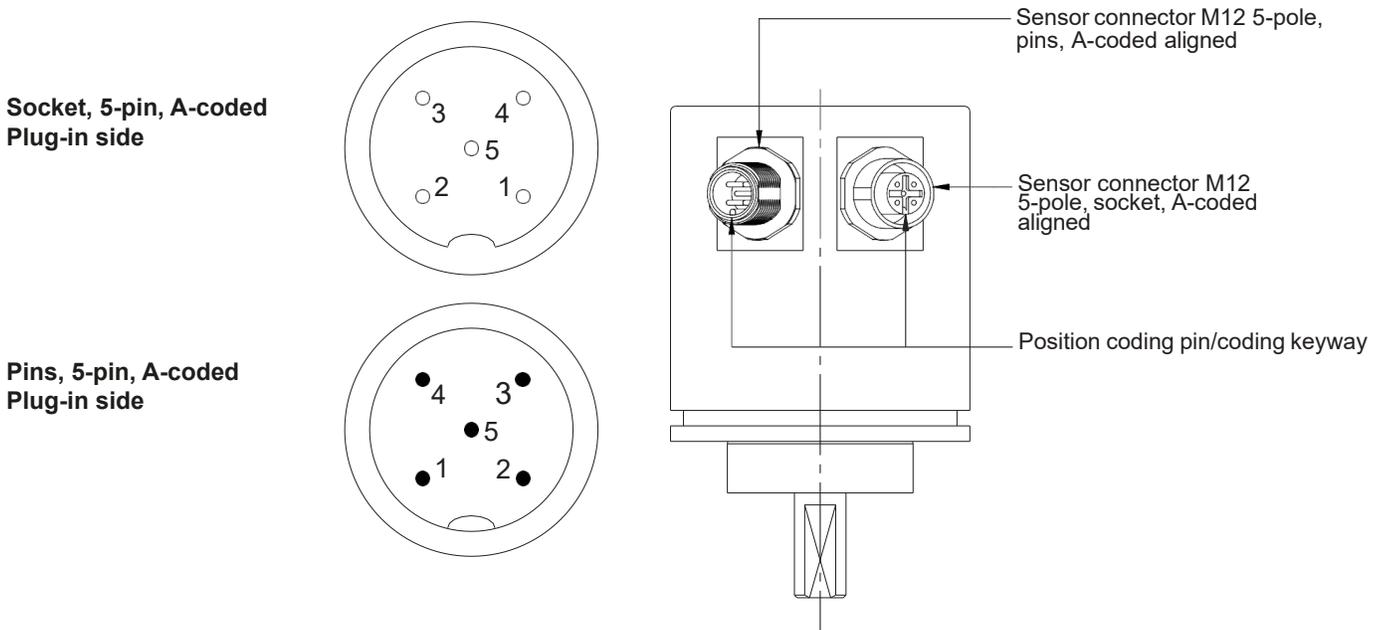
ELECTRICAL CONNECTION - PINOUT

GALVANIC POTENTIAL ISOLATION: -V$_S$, CAN_GND AND HOUSING/CABLE SHIELDING

The description of the different versions of galvanic potential (V1 to V3) relates exclusively to the interrelationships between the individual potentials (-V$_S$, CAN_GND and housing/cable shielding), i.e. whether or not they are galvanically connected. The connection assignment (TYxxxxx) should be observed. This connection assignment is included with each device and a copy can be requested as needed.

V1: CAN_GND, -V$_S$ AND HOUSING/CABLE SHIELDING GALVANICALLY ISOLATED

This version has complete galvanic isolation. The housing/cable shielding are galvanically isolated from -V$_S$ and CAN_GND, and -V$_S$ and CAN_GND are also galvanically isolated from one another. The cable shielding is galvanically connected to the housing via the connector housing.

PIN	Function
1	CAN GND
2	Operating voltage + V$_S$
3	Operating voltage - V$_S$
4	CAN_H
5	CAN_L

V2: CAN_GND AND -V$_S$ NOT GALVANICALLY ISOLATED, CABLE SHIELDING GALVANICALLY ISOLATED

This version has partial galvanic isolation: The housing/cable shielding are galvanically isolated from -V$_S$ and CAN_GND.
But: -V$_S$ and CAN_GND are not galvanically isolated from one another. The cable shielding is assigned to pin 1.

PIN	Function
1	Shielding
2	Operating voltage + V$_S$
3	Operating voltage - V$_S$ and CAN-GND
4	CAN_H
5	CAN_L

V3: CAN_GND, -V$_S$ AND CABLE SHIELDING/HOUSING NOT GALVANICALLY ISOLATED

This version has no galvanic isolation: The housing/cable shielding is not galvanically isolated from -V$_S$ and CAN_GND and -V$_S$ and CAN_GND are not galvanically isolated from one another.

PIN	Function
1	Shielding – short-circuited with PIN 3
2	Operating voltage + V$_S$
3	Operating voltage - V$_S$ and CAN-GND – short-circuited with PIN 1
4	CAN_H
5	CAN_L

ORDER CODE FORMAT

STANDARD VERSION

TRN	58 -	KP	A	16384	R	4096	S4	S1	V1	N	160

TBN **TMN** **TRN**			Single-turn rotary encoder with CANopen-Interface Multi-turn rotary encoder with electronic counter and CANopen-Interface Multi-turn rotary encoder with mechanical gearbox and CANopen-Interface	
58	Design form	42 - 53 - 58 - 78 -	Design form Ø 42 mm Design form Ø 53 mm, standard KIT Encoder Design form Ø 58 mm (ATEX protection for zone 2/22 on request) Design form Ø 78 mm, Explosion-proof enclosure for Zone 1/21 TRX16360	
KP	Flange and shaft	E K KF KP KZ S SN SP SR VP	Bearingless "KIT Encoder" with external magnet (standard design form 53, otherwise on request) Clamping flange, shaft Ø 10 mm with flattening Clamping flange, shaft Ø 10 mm with woodruff key Clamping flange, shaft Ø 10 mm with feather key Clamping flange, shaft for target wheel ZRS (see ZRS11877) Synchro flange, shaft Ø 6 mm with flattening Synchro flange, clamping shaft Ø 12 mm with woodruff keyway for feather key Synchro flange, shaft Ø 10 mm with feather key Synchro flange, clamping shaft for Ø 12 mm for torque arm ZMS12939 Square flange, shaft Ø 10 mm with feather key (only for design 78)	
A	Housing material	A B P S U V Leave blank	Aluminium 3.2315 - (AlMgSi1) Burnished steel for shielding strong magnetic fields Plastic Stainless steel - 1.4305 (AISI 303) Stainless steel (1.4104) for shielding against strong magnetic fields (only available with an integral bearing). Stainless steel - 1.4404 (AISI 316L) or 1.4401 (AISI 316) for type 78 Without housing (plain PCB)	
16384	Resolution in Steps/360°	4096 … 65536	12 bit … 16 bit	
R	Code	R S	Binary Slewing ring functionality (only model TRN)	
4096	Measuring range	4096 18	Rotations [decimal] only TRN (mechanical gearbox) other measuring ranges on request 18 bit, corresponds to 262,144 revolutions, only TMN (electronic counter) other measuring ranges on request	
S4	Profile	C3 M1 S4	Standard CANopen, Profile version 4.1.0 standard sensor interface Standard CANopen, Profile version 4.1.0 multi sensor interface CANopen Safety SIL2, Profile version 4.1.0	
S1	Electrical connection Combine S, T, K or L and quantity	S T K L 1 2	Device connector M12, 5 Pole, radial Device connector M12, 5 Pole, axial Cable, 1m, radial (other lengths on request) Cable, 1m, axial (other lengths on request) 1 x Device connector or cable 2 x Device connector or cable (Bus In/Bus Out)	
V1	Galvanic Isolation	V1 V2 V3	-V_S ⟂ CAN_GND ⟂ Shield/housing -V_S = CAN_GND ⟂ Shield/housing -V_S = CAN_GND = Shield/housing	
N	Output	N	CANopen-Interface	
160	Electrical and mechanical variants*	160	Standard	

* According to the datasheet, the basic (standard) versions are indicated by the number 160. Deviations are indicated by a version number and are documented at the factory.

ACCESSORIES (PLEASE NOTE THE SHAFT ENCODER VERSION)

MATING CONNECTORS (ORDER SEPARATELY)

Order number	Type	Design & wire fixing	Housing-material	Cable Ø & wire size	Shielding & IP grade
STK5GS56	M12-A 5-pole, female	Straight, screws	Zinc die cast, nickel-plated	6 – 8 mm ≤ 0.75 mm^2	On housing IP67
STK5GP90	M12-A 5-pole, male	Straight, screws	Zinc die cast, nickel-plated	6 – 8 mm ≤ 0.75 mm^2	On housing IP67
STK5WS58	M12-A 5-pole, female	Angled, screws	Zinc die cast, nickel-plated	6 – 8 mm ≤ 0.75 mm^2	On housing IP67
STK5WP102	M12-A 5-pole, male	Angled, screws	Zinc die cast, nickel-plated	6 – 8 mm ≤ 0.75 mm^2	On housing IP67
STK5GS107	M12-A 5-pole, female	Straight, screws	Stainless steel 1.4404	5.5 – 8.6 mm ≤ 0.75 mm^2	On housing IP67
STK5GS106	M12-A 5-pole, male	Straight, screws	Stainless steel 1.4404	5.5 – 8.6 mm ≤ 0.75 mm^2	On housing IP67

Please note: If angled mating connectors are used, please specify the position of the coding groove so that the device connectors can be aligned accordingly.

COUPLINGS

X and Y: Bore diameter for shaft support

BKM 26 / x - y . . . . Play-free bellow coupling
Datasheet **11995**
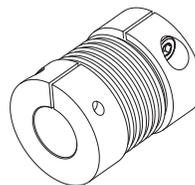
BKK 32 / x - y . . . . Play-free bellow coupling
Datasheet **11840**
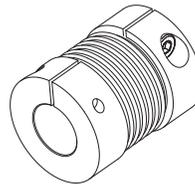
KK14S / x - y . . . . Play-free clamp coupling without groove
Datasheet **12301**
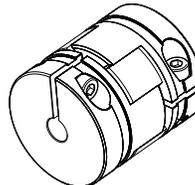
KK14N / x - y . . . . Play-free clamp coupling with groove
Datasheet **12301**
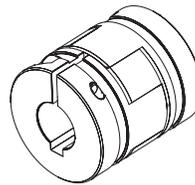
ACCESSORIES (SELECTION)

MOUNTING BRACKET

Mounting brackets for shaft encoder assembly

KL 662-S . . . . Datasheet *10111*
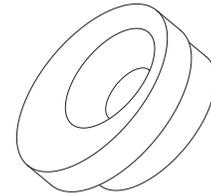
TORQUE SUPPORT

Torque support/stator coupling. Suitable for use as a shaft encoder bracket for the clamping shaft shaft version, for the offsetting of radial and axial drive shaft play for Ø 58 mm shaft encoders

ZMS58 . . . . Datasheet *12939*
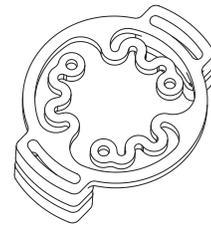
MEASURING WHEEL

Play-free measuring wheel ZRS for Ø 58 mm shaft encoders for live ring applications
ZRS . . . . Datasheet *11877*
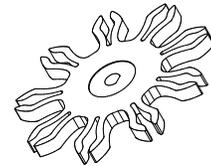
DOCUMENTATION

DOCUMENTATION, EDS FILE, ETC.

The following documents plus the EDS file, CRC calculation program and EPC CANopen tester can be found in the Internet under www.encoder.com in the documentation area, model TRN/TBN.

Datasheet TXN14271
Manual TXN/TXSN15469
Certificate, TBN/TRN S4 . . . . TXN15603
Installation instructions AN16169
Safety Library (VDMA/Sistema) . . . . Safety Library
Declaration of Conformity . . . . CE: ZE12467, UKCA: ZE16569
Reach compliant QS15286
RoHS compliant QS13284
Pin assignment . . . . TYxxxxx
          (enclosed with each device or on request, for series deliveries the pin assignment is no longer enclosed after customer consultation for environmental reasons)
CRC checksum program for parameterization . . . . www.encoder.com/hubfs/products/safety/files/CRC-Calculator.zip
Specification CRC software CRC14076
EPC CANopen-Tester. . . . . www.encoder.com/hubfs/products/safety/files/CANopenTest.zip

INSTALLATION DRAWINGS

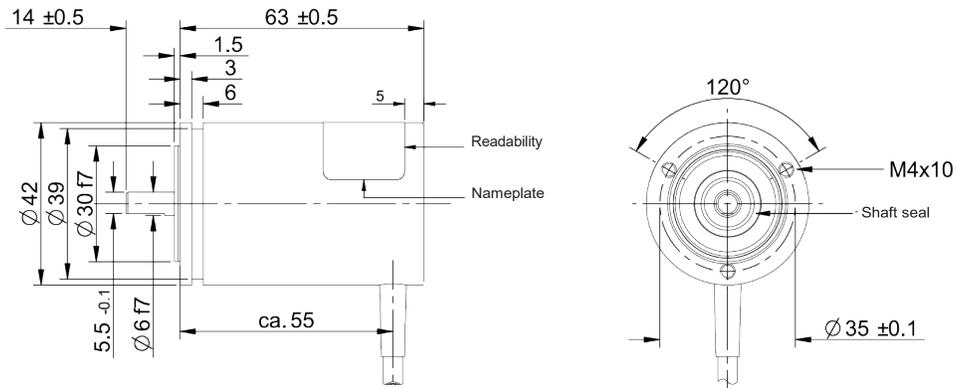### DRAWINGS

INSTALLATION DRAWINGS

MODEL E.G.: TBN42 - SX XXXXX R XX K1 VX N01

Dimensions in mm
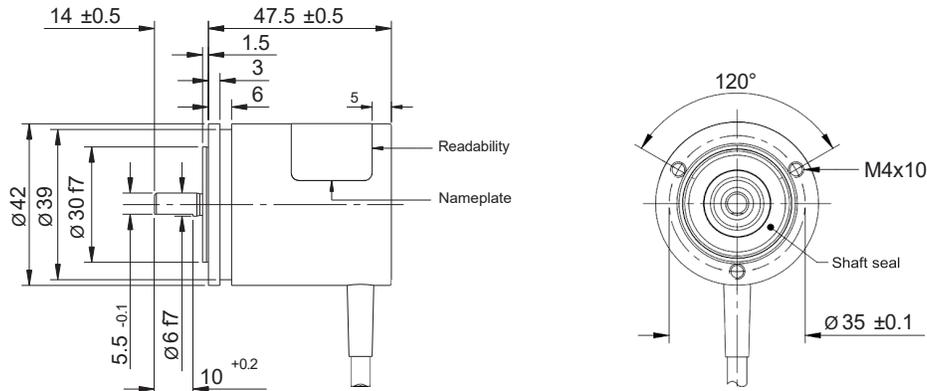
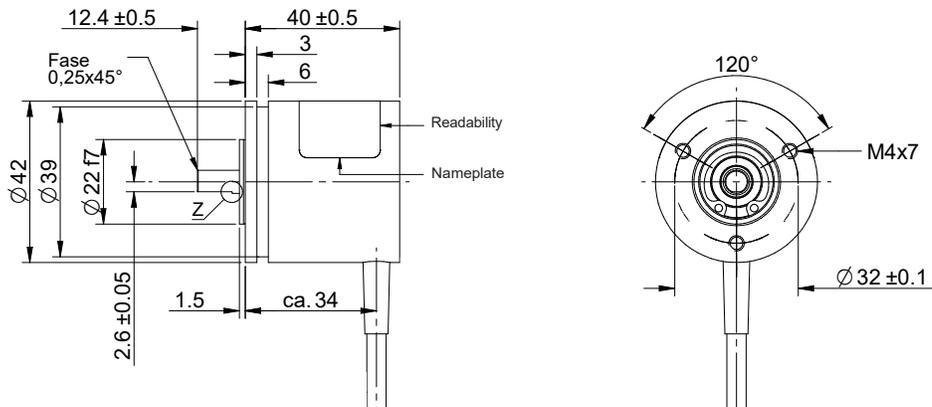### MODEL E.G.: TRN42 - SX XXXXX R 4096 XX K1 VX N01

Dimensions in mm

MODEL E.G.: TBN42 - SX XXXXX R XX K1 VX NXX
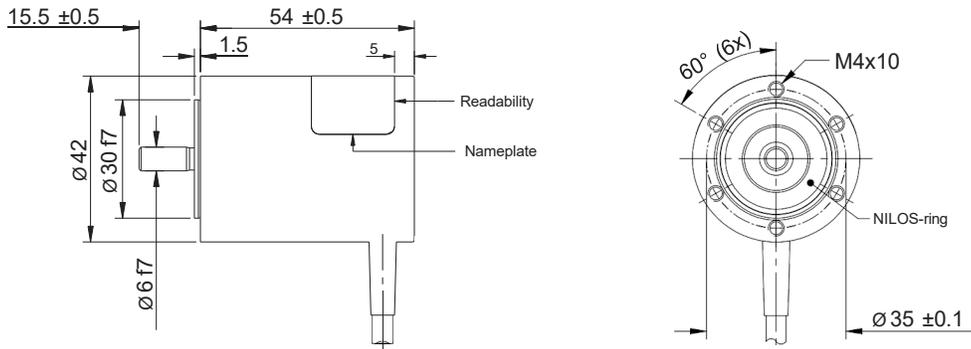
Dimensions in mm
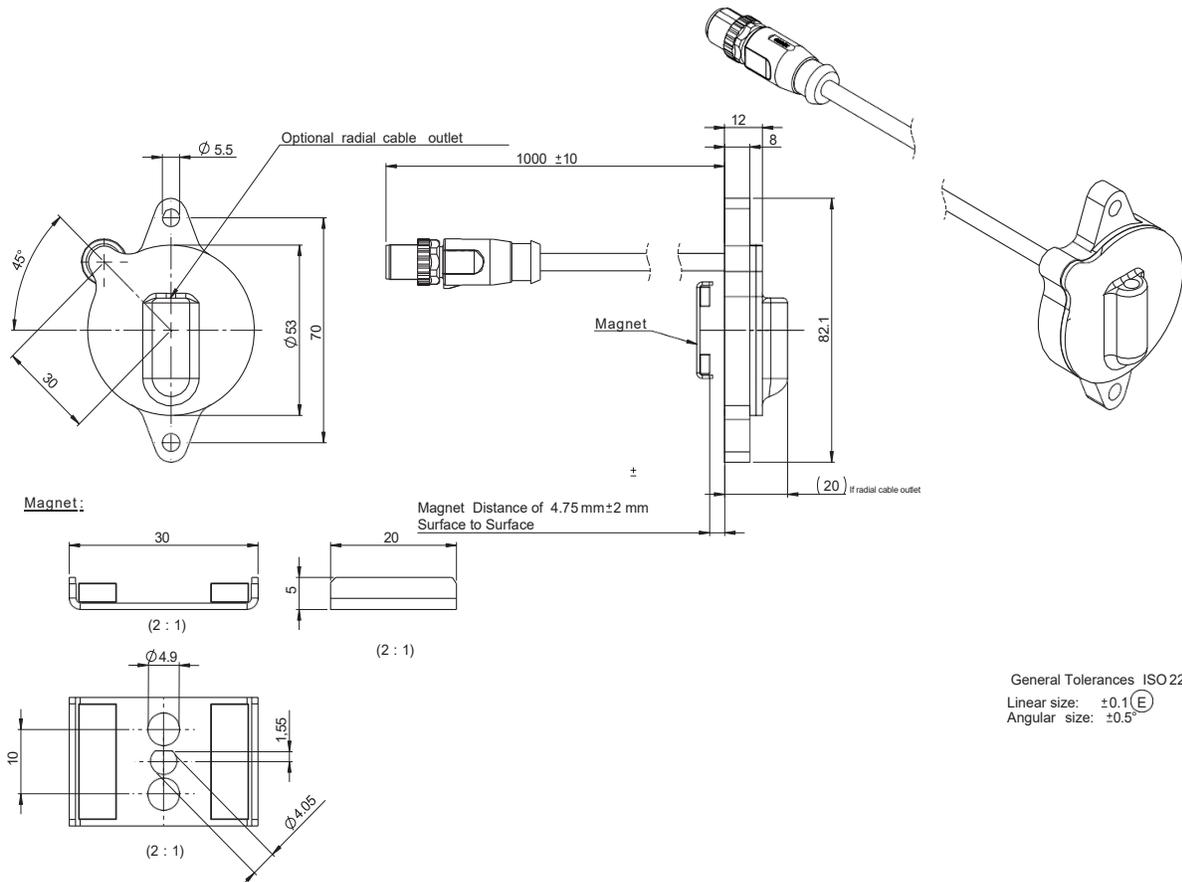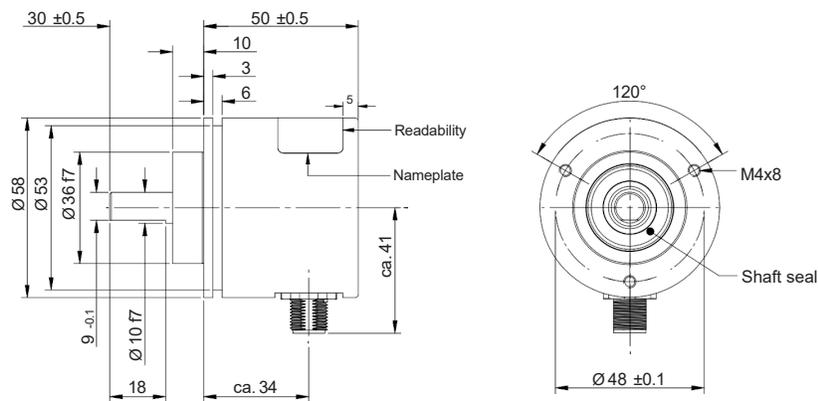special variant short, not standard according to datasheet

INSTALLATION DRAWINGS

MODEL E.G.: TRN42 - SV XXXXX R 4096 XX K1 VX NXX

Dimensions in mm

MODEL E.G.: TXN53-EX-T1(K1)V2NXXX

Dimensions in mm

General Tolerances ISO 22081
Linear size: ±0.1 (E)
Angular size: ±0.5°

INSTALLATION DRAWINGS

MODEL E.G.: TBN/TMN55 - SX XXXXX R XX K1 VX NXX

Dimensions in mm
special variant short, not standard according to datasheet

screened cable
Li2YC12Y 4x2x0.14
nominal cable length: 1000mm + 75mm
open strand ends: 75mm
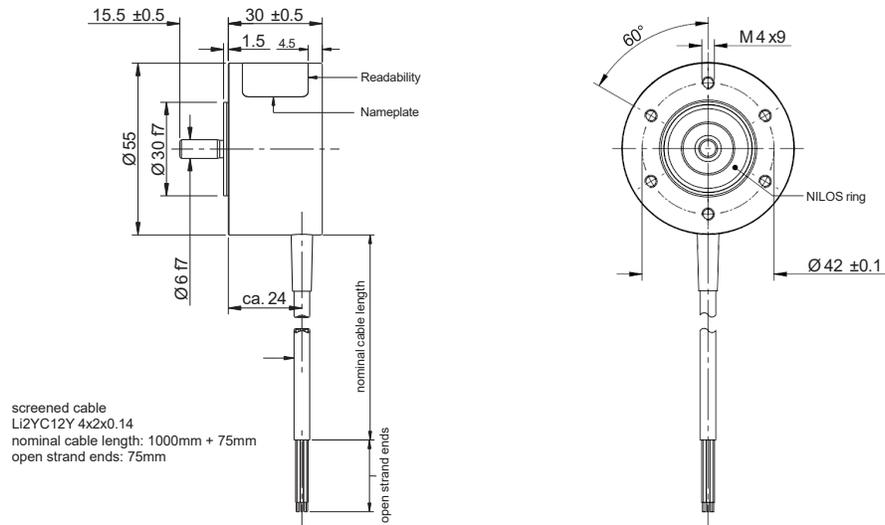
MODEL E.G.: TBN/TMN58 - KX XXXXX R XX S1 VX N01

Dimensions in mm
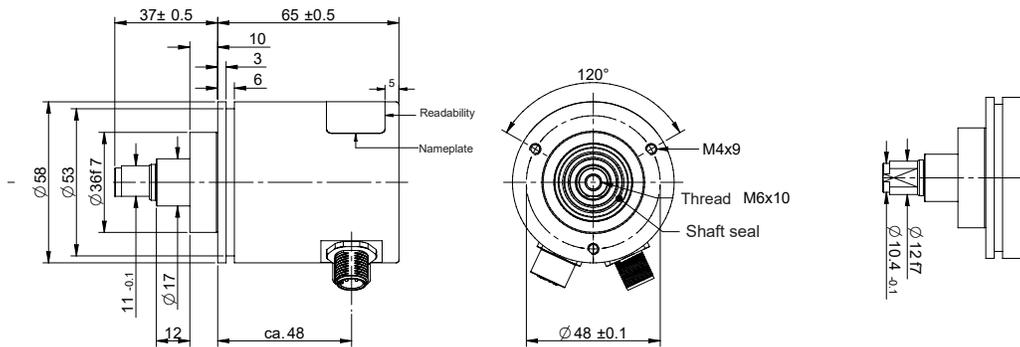
INSTALLATION DRAWINGS

MODEL E.G: TRN58 - KX XXXXX X 4096 XX S1 VX N01
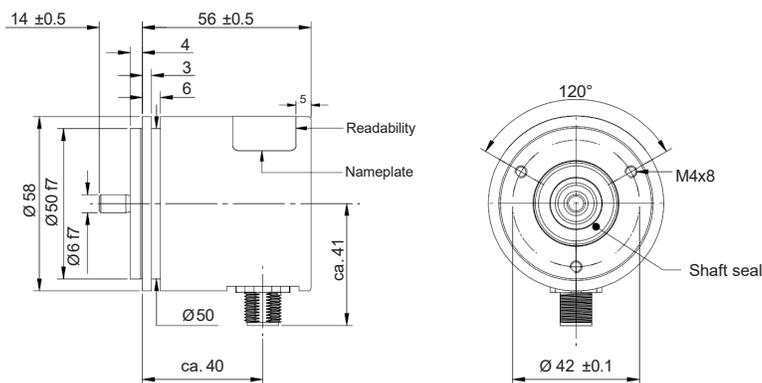
Dimensions in mm
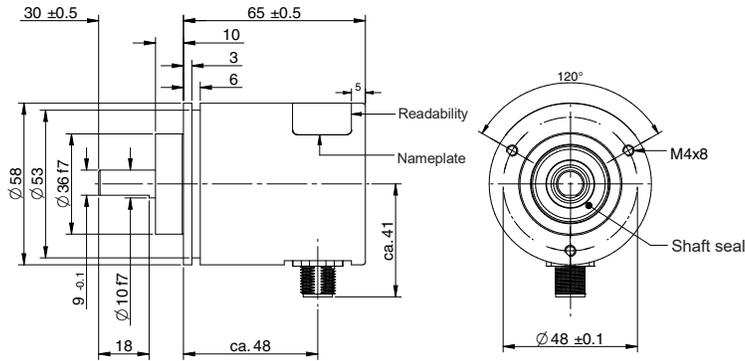
MODEL E.G.: TRN58 - KZX XXXXX X 4096 XX S2 VX N01

Dimensions in mm

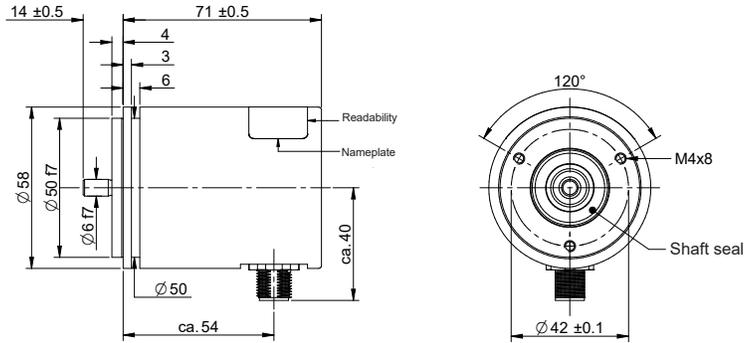### MODEL E.G.: TBN/TMN58 - SX XXXXX R XX S1 VX N01

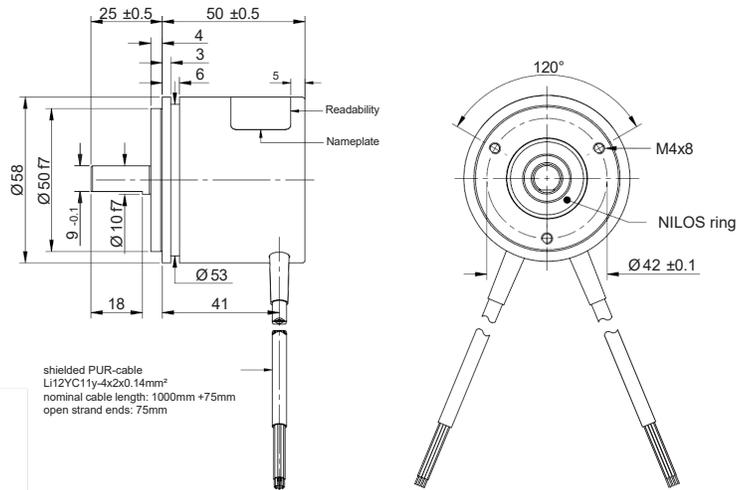Dimensions in mm

INSTALLATION DRAWINGS

MODEL E.G.: TRN58 - SX XXXXX X 4096 S4/C3 S1 VX N01

Dimensions in mm

MODEL E.G.: TRN58 - SX XXXXX X 4096 XX K2 VX NXX

Dimensions in mm - special variant short, not standard according to datasheet

INSTALLATION DRAWINGS

MODEL E.G.: TBN/TMN58 - SRX XXXXX R XX S1 VX N01 AND ZMS58-S-H1-K01

Dimensions in mm
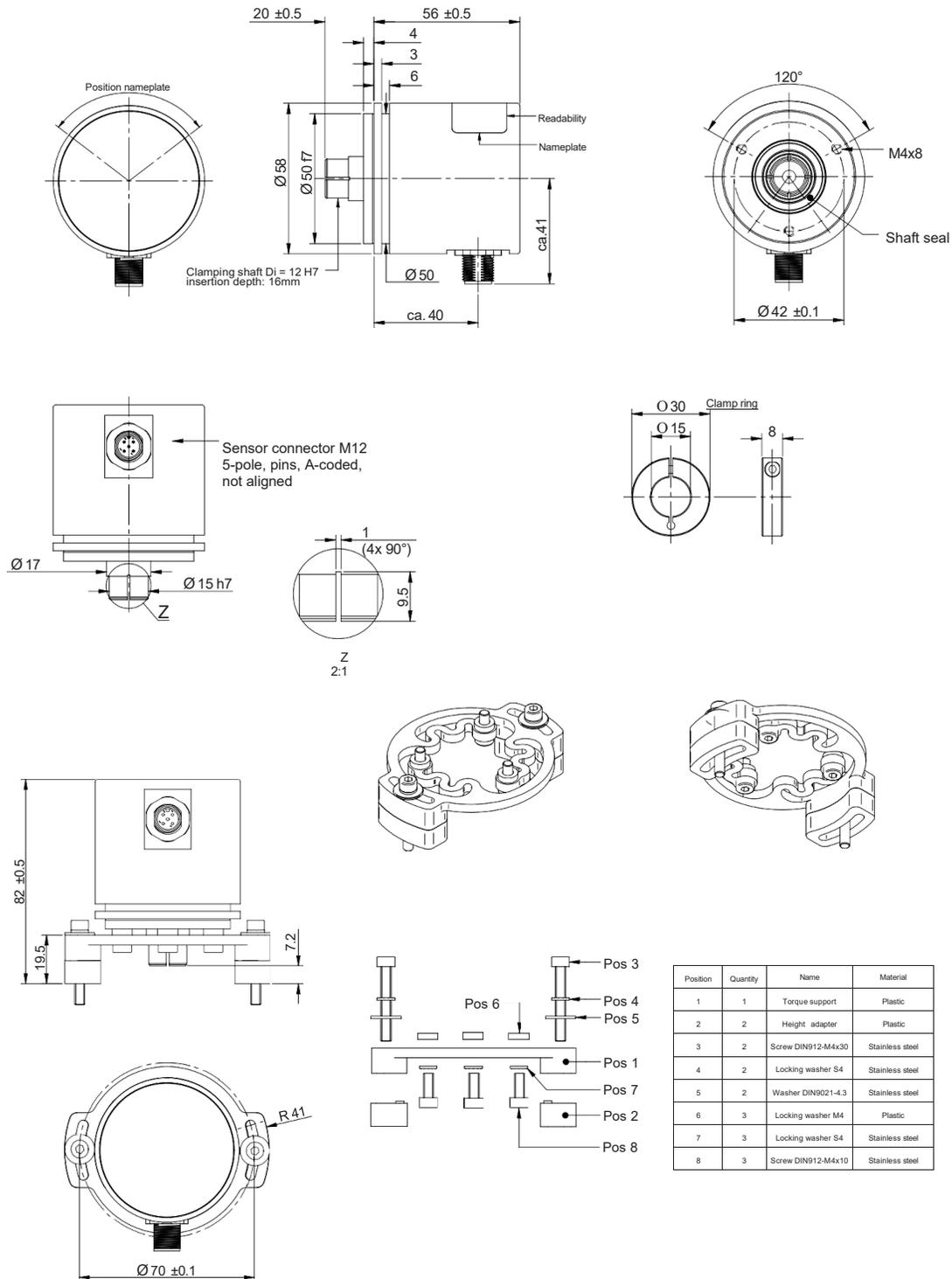
Position	Quantity	Name	Material
1	1	Torque support	Plastic
2	2	Height adapter	Plastic
3	2	Screw DIN912-M4x30	Stainless steel
4	2	Locking washer S4	Stainless steel
5	2	Washer DIN9021-4.3	Stainless steel
6	3	Locking washer M4	Plastic
7	3	Locking washer S4	Stainless steel
8	3	Screw DIN912-M4x10	Stainless steel

INSTALLATION DRAWINGS

MODEL E.G.: TRN58 - SRX XXXXX R 4096 XX S1 VX N01 UND ZMS58-S-H1-K01

Dimensions in mm
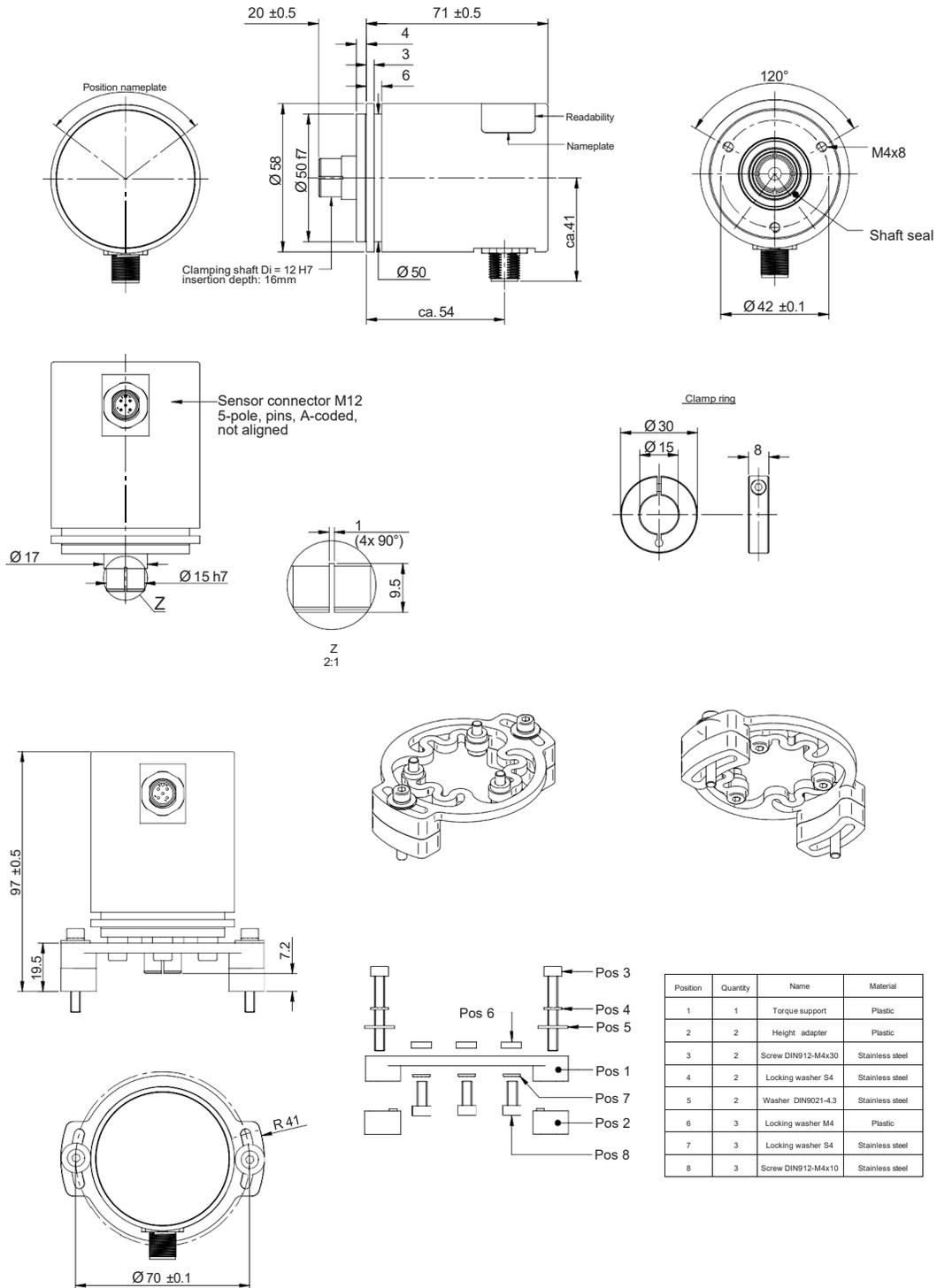
Position nameplate

20 ±0.5   71 ±0.5   4   3   6

Ø 58
Ø 50 f7

Readability
Nameplate

ca. 41

Ø 50
ca. 54

Clamping shaft Di = 12 H7
insertion depth: 16mm

120°
M4x8
Shaft seal
Ø 42 ±0.1

Sensor connector M12
5-pole, pins, A-coded,
not aligned

Clamp ring
Ø 30
Ø 15
8

Ø 17
Ø 15 h7
Z

1
(4x 90°)
9.5

Z
2:1

97 ±0.5
19.5
7.2

R 41
Ø 70 ±0.1

Pos 3
Pos 4
Pos 5
Pos 6
Pos 1
Pos 7
Pos 2
Pos 8

Position	Quantity	Name	Material
1	1	Torque support	Plastic
2	2	Height adapter	Plastic
3	2	Screw DIN912-M4x30	Stainless steel
4	2	Locking washer S4	Stainless steel
5	2	Washer DIN9021-4.3	Stainless steel
6	3	Locking washer M4	Plastic
7	3	Locking washer S4	Stainless steel
8	3	Screw DIN912-M4x10	Stainless steel

INSTALLATION DRAWINGS

MODEL E.G.: TRN/TBN78 - KPX XXXXX X 4096 S4 K2 VX NXX

Dimensions in mm
ATEX Variant zone 1/21 and 2/22

Torque 20-30 Nm
cable entry part

Torque 30 Nm
cable glands entry part

label no. 1
Terminal marking

label no. 2
Nameplate

20.0   16.0
5.0
2.0
Ø78.0
Ø36.0 f7
Ø10.0 h7
3 H11
56.0
118.0

Ø48.0
3xM6; 6 deep
at 120°
3 x M3; 6 deep
at 120°
3 x M4; 6 deep
at 120°
Ø3; 8 deep
120°
120°
15°   15°

Torque 3.5 Nm ± 0.1 Nm

Earth ground