

- For converting linear displacements of up to 8 m into a rotary movement
- With gear to change to a singleturn movement at the encoder
- Encoder: absolute singleturn with CANopen Safety interface, SIL2
- Very tight design
- Durable plastic housing for lower costs



KEY INFORMATION OVERVIEW

DESIGN & FUNCTION

The linear movement of a flexible steel cable with a length of up to 8 m is converted into a rotary movement with the aid of a measuring drum. The measuring drum is connected to a gear which changes the several turns of the cable transducer to one turn at the integrated absolute singleturn encoder. In this way a change in displacement of the measuring cable causes the shaft of the encoder to rotate by a directly proportional amount which can be recorded.

The restoring force of the spring drive holds the measuring cable tight at all times and prevents any sagging which would otherwise induce an error. Inclined winding ensures that the cable is wound up precisely wrap by wrap in the first layer. For measuring strokes up to 5 metres single-layer winding leads to a better linearity. For longer measuring strokes multiple-layer winding is realized.

The SWEKN is designed for the measurement with a circuit board (absolute singleturn encoder) with CANopen Safety interface. The shaft of the cable transducer is connected to a gear to change the movement of the cable transducer to one turn. For the different measuring strokes different gears are used. The housing over the circuit board and the gear protects the device against dust and water. A consideration of the use of cable-type displacement converters in Safety-applications is discussed in [SWX16448](#).

FEATURES AND INTERFACES OF ENCODERS

- With integrated SIL2 encoder with CANopen Safety interface (other interfaces on request)
- Measuring stroke 1.5 m, 2.5 m, 3.5 m, 5 m and 8 m
- Electrical connection via cable

TECHNICAL DATA

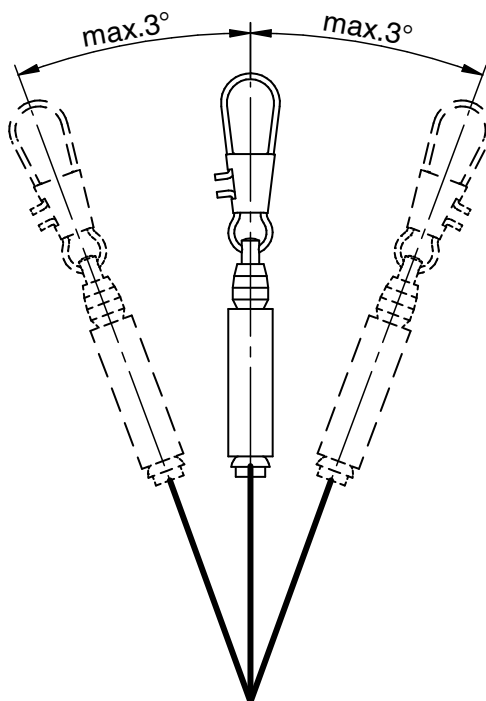
MECHANICAL DATA

| | |
|--------------------------------------|---|
| Measuring ranges | 1.5 m, 2.5 m, 3.5 m, 5 m, 8 m |
| Drum circumference | 263 mm |
| Permissible cable velocity | 1 m/s |
| Permissible cable acceleration | ca. 50 m/s ² |
| Force required to draw out the cable | ca. 10 N |
| Cable material | stainless steel (covered with polyamide) |
| Cable diameter | 0.61 mm for strokes 1.5 m, 2.5 m and 3.5 m 0.45 mm for strokes 5 m and 8 m |
| Housing material | plastic (PA6) |
| Linearity | t.b.d. (system) |
| Deviation from straight pull-off | max. $\pm 3^\circ$ in any direction (refer to drawing below) |

ENVIRONMENTAL DATA

| | |
|------------------------------|------------------|
| Operating temperature range | -40 °C to +80 °C |
| Storage temperature range | -40 °C to +80 °C |
| Resistance against shock | t.b.d. (system) |
| Resistance against vibration | t.b.d. (system) |
| Mass | ca. 0.6 kg |
| Protection grade | IP67 / IP69K |

Note: The cable exit should be downwards or sideways. The cable must be extracted rectilinearly with reference to the housing (deflection max. 3° in any direction admitted).



TECHNICAL DATA

ELECTRICAL DATA OF INTEGRATED ENCODER

Operating voltage 9 to 36 VDC with reverse-polarity protection and short-circuit protection
 Power consumption < 1 W
 Resolution of the encoder 16,384 steps / 360° / 14 bit, (16 bit on request)
 Resolution of the system 0.1 mm / step (1.5 m), 0.15 mm / step (2.5 m), 0.21 mm / step (3.5 m),
 0.31 mm / step (5 m), 0.49 mm / step (8 m)
 Speed value in addition to the position signal, a digits/gate time speed signal is also generated,
 which can be adapted by the customer for the application via an adjustable gate time
 Speed value data format 16 Bit (signed integer)
 Gate time 1 to 1,000 ms
 Internal updating time 1 ms

DATA PROFILE CANOPEN SAFETY SIL2

SRDO1 (position) - normal and bit-inverted

| Byte 0 | | | | | | | | Byte 1 | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---------------|---|----|----|----|----|----|----|-----|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | |
| LSB | | | | | | | | data position | | | | | | | | MSB | |

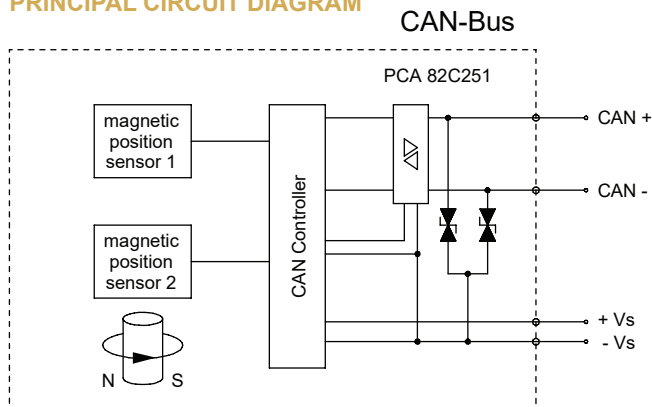
| Byte 0 | | | | | | | | Byte 1 | | | | | | | | | |
|--------|---|---|---|---|---|---|---|------------------------|---|----|----|----|----|----|----|-----|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | |
| LSB | | | | | | | | data position inverted | | | | | | | | MSB | |

SRDO2 (speed) - normal and bit-inverted

| Byte 0 | | | | | | | | Byte 1 | | | | | | | | | |
|--------|---|---|---|---|---|---|---|--------|---|----|----|----|----|----|----|-----|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | |
| LSB | | | | | | | | speed | | | | | | | | MSB | |

| Byte 0 | | | | | | | | Byte 1 | | | | | | | | | |
|--------|---|---|---|---|---|---|---|----------------|---|----|----|----|----|----|----|-----|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | |
| LSB | | | | | | | | speed inverted | | | | | | | | MSB | |

PRINCIPAL CIRCUIT DIAGRAM



Further information about the CANopen Safety specification and SIL2 certification of the encoder circuit board are described in data sheet [TXN14271](#) (see model TBN).

ORDER CODE FORMAT

| | | | | |
|--------------|--|-----------------------------|--|-------------------------|
| SWEKN | - 5 - | K - | N01 | STANDARD VERSION |
| SWEKN | Cable-type displacement converter with integrated CANopen Safety encoder SWEKN | | | |
| 5 | Measuring range | 1,5 2,5 3,5 5 8 | 1.5 m 2.5 m 3.5 m 5 m 8 m | |
| K | Electrical connection | K | Connection via cable | |
| N01 | Electrical and mechanical variants* | N01 | Standard (with CANopen Safety interface) | |

DOCUMENTATION

DOCUMENTATION

The following documents are available on request:

| | |
|--|----------------------------|
| Data sheet cable-type displacement converter | SWEKN17283 |
| Declaration of Conformity CE | ZE12467 |
| Declaration of Conformity UKCA | ZE16569 |
| Reach compliant | QS15286 |
| RoHS compliant | QS13284 |

Integrated encoders with different interfaces can be used. They are described in the corresponding data sheets, e.g.:

| | |
|--|--------------------------|
| Data sheet of an encoder with CANopen / CANopen Safety interface | TXN14271 |
|--|--------------------------|

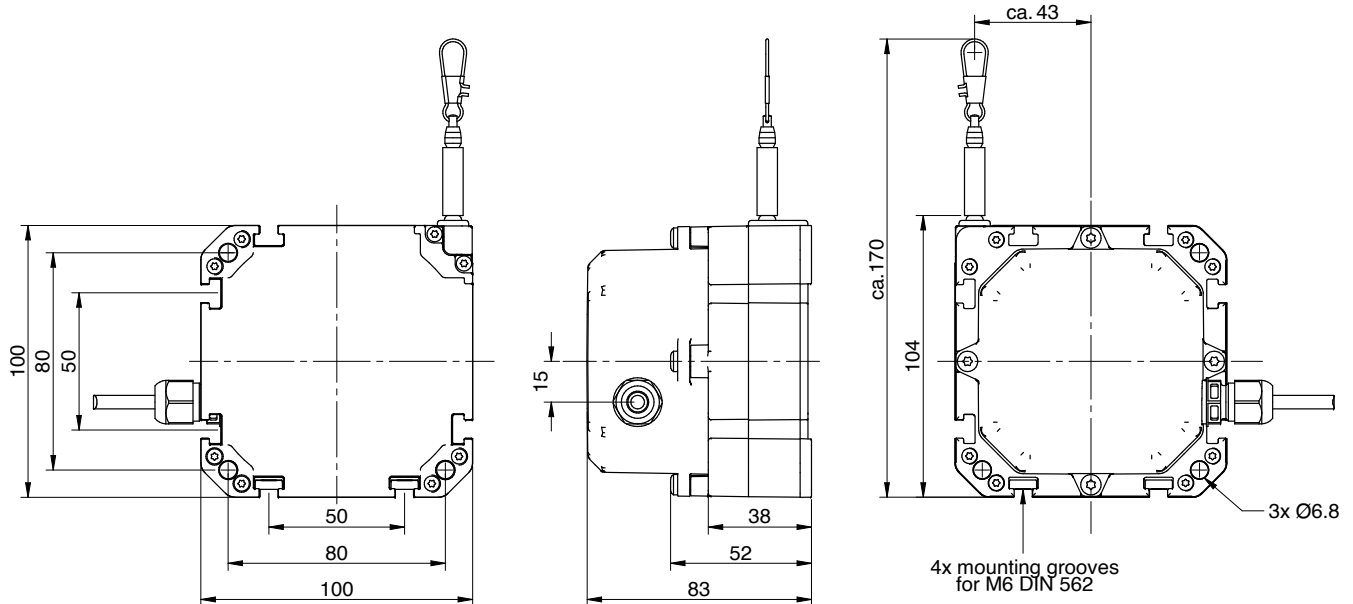
(Also other interfaces can be used. Please contact our specialists)

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

INSTALLATION DRAWINGS

SWEKN-1,5-K-N01 AND SWEKN-2,5-K-N01

Dimensions in mm



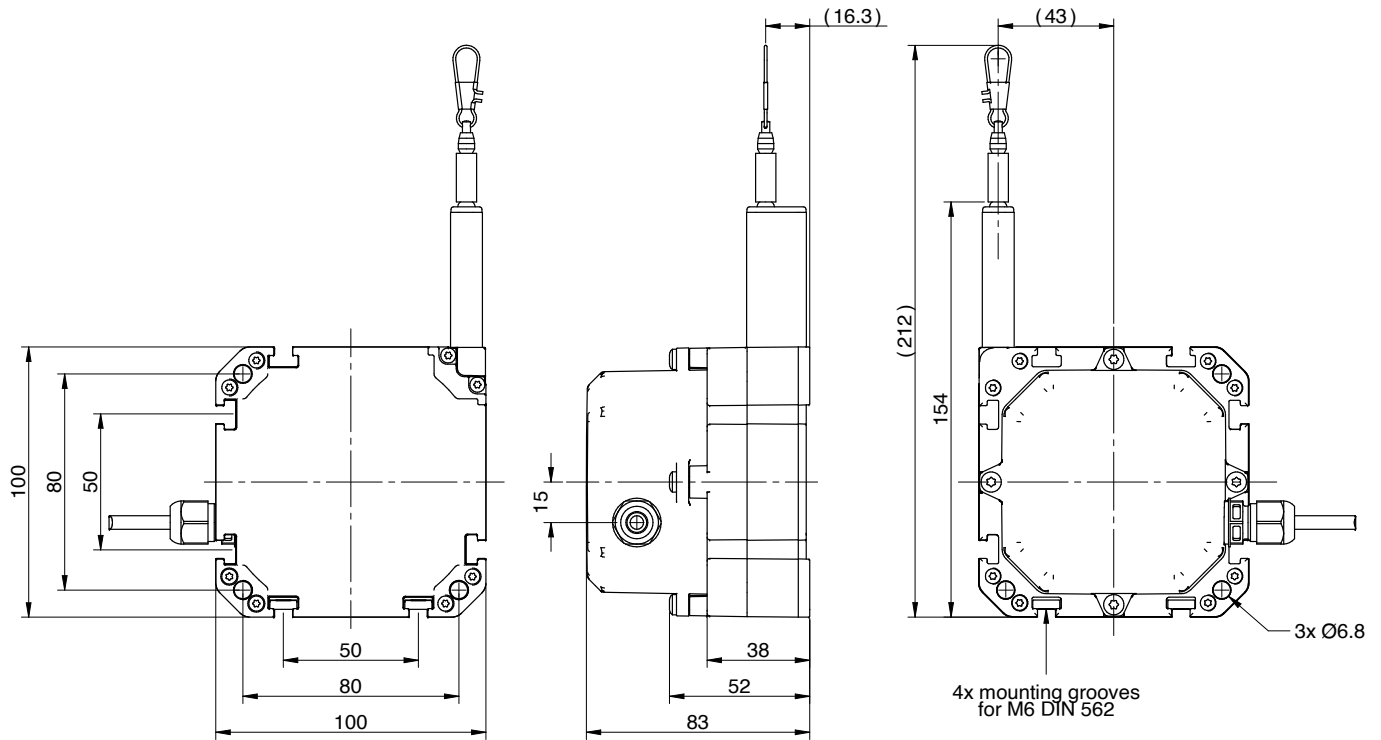
MATERIALS USED AT CONVERTER

Housing PA 6

INSTALLATION DRAWINGS

SWEKN-3,5-K-N01, SWEKN-5-K-N01 AND SWEKN-8-K-N01

Dimensions in mm



MATERIALS USED AT CONVERTER

Housing PA 6