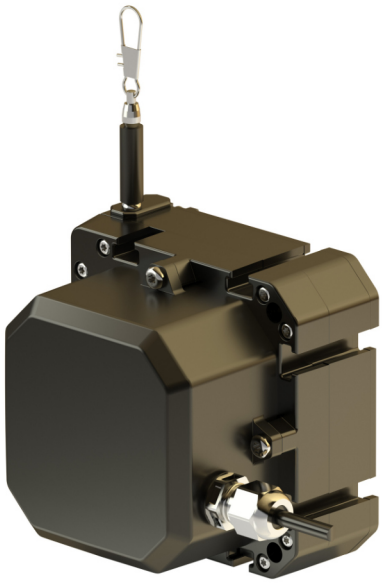
SUPREME SENSORING

Cable-type displacement converter with integrated encoder Model SWEKN Interface: CANopen Safety

Document no.:
SWEKN 17283 CE
23.02.2026



- **For converting linear displacements of up to 6 m (8 m in preparation) into a rotary movement**
- **Encoder 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 6 m is converted into a rotary movement with the aid of a measuring drum. The output of the integrated CANopen Safety encoder is a 14 bit value. The conversion to the displacement is given by the „resolution of the system“ (see page 3).

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 measuring strokes more than 5 metres multiple-layer winding is realized.

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, e.g. PROFIsafe or FSoE on request)
- Measuring stroke 3 m and 6 m with different gears (up to 8 m in preparation)
- With chimney for better linearity
- Electrical connection via plug or cable

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TECHNICAL DATA

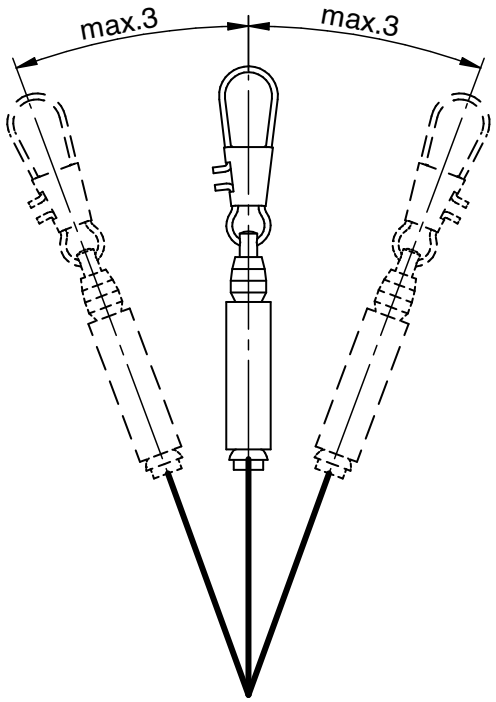
MECHANICAL DATA

Measuring ranges	3 m and 6 m
Drum circumference*	ca. 263 mm
Permissible cable velocity	1 m/s
Permissible cable acceleration	ca. 50 m/s²
Force required to draw out the cable	ca. 10 N
Cable material	stainless steel (covered with polyamide)
Cable diameter	0.61 mm for a stroke of 3 m 0.45 mm for a stroke of 6 m
Housing material	plastic (PA6)
Deviation from straight pull-off	max. ± 3° in any direction (refer to drawing below)
Live span of cable and spring drive	≥ 10^6 cable strokes

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 (without cable exit)

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).



* Due to the design the „resolution of the system“ (page 3) is important for the conversion of the output signal to a displacement and not the the drum circumference.

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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, i.e. 14 bit, (16 bit on request)
Resolution of the system	0.19 mm / step (3 m)*, 0.39 mm / step (6 m)*
Linearity of the system	± 30 mm
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

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

ELECTRICAL CONNECTION

ELECTRICAL CONNECTION

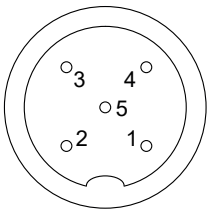
The electrical connection can be realized via the following possibilities

- With one connector M12x1, pin, 5 pin, A coded
- With two connectors M12x1, pin and socket, 5 pin, A coded, Bus In and Bus Out
- With one cable, length 1 m (see drawing page 6)
- With two cables, length each 1 m

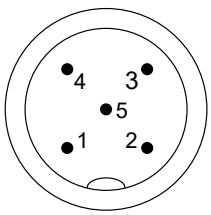
The connection assignment TYxxxxx is part of the scope of delivery and is included with each device. In order to reduce unnecessary paper consumption, this can be omitted for standard devices after consultation.

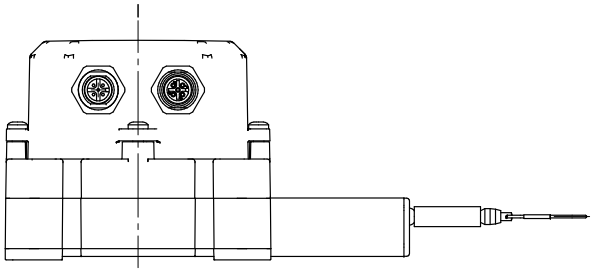
PIN DIAGRAM M12X1, 5-PIN, VIEW OF PLUG-IN SIDE AND ORIENTATION (STANDARD)

Socket, 5-pin, A-coded, not aligned



Pins, 5-pin, A-coded, not aligned





* The actual value is shown on the item when supplied

ORDER CODE FORMAT

SWEKN	- 6 -	S4 -	S2 -	V1-	N01	STANDARD VERSION

SWEKN	Cable-type displacement converter with integrated CANopen Safety encoder SWEKN		
6	Measuring range	3 6	3 m 6 m
S4	Profile	C3 S4	Standard CANopen, Profile version 4.1.0CANopen Safety SIL2, Profile version 4.1.0
S2	Electrical connection	S1 S2 K1 K2	1 x Device connector M12, 5 pins, radial 2 x Device connector M12, 5 pins, radial (Bus In / Bus Out) 1 x Cable, 1 m radial 2 x Cable, 1 m radial (Bus In / Bus Out)
V1	Functional Isolation	V1 V2 V3	$-V_S$ ǂ CAN_GND ǂ shielding/housing $-V_S$ = CAN_GND ǂ shielding/housing $-V_S$ = CAN_GND = shielding/housing For details see TXN14271
N01	Electrical and mechanical variants*	N01	Standard (with CANopen interface)

DOCUMENTATION

DOCUMENTATION

The following documents can be found in the Internet under www.twk.de/en in the documentation area, model SWEKN:

Data sheet cable-type displacement converter SWEKN17283
Declaration of Conformity CE ZE12467
Declaration of Conformity UKCA ZE16569
Reach compliant QS15286
RoHS compliant QS13284
POP Declaration of Conformity QS17238

Data sheet of encoders with CANopen / CANopen Safety interface. TXN14271
(Other interfaces on request)

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

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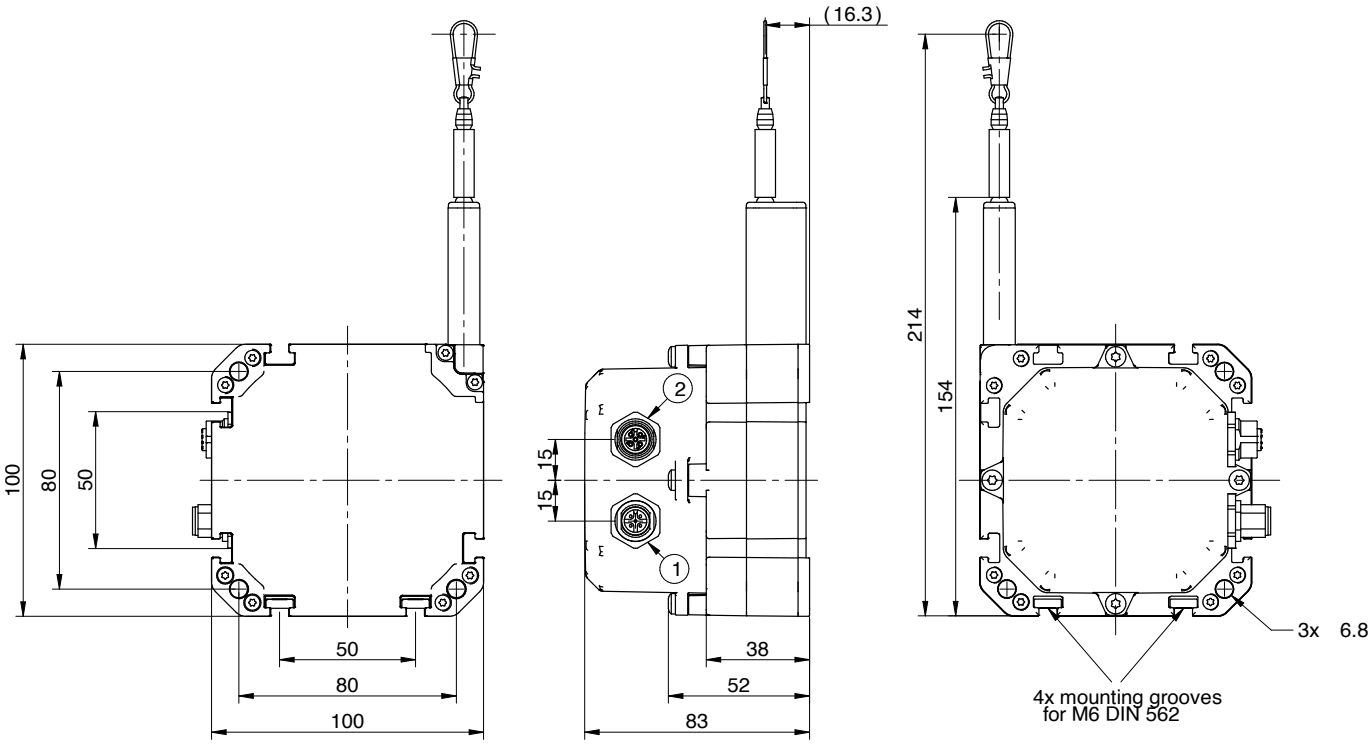
INSTALLATION DRAWINGS

SWEKN-X-XX-S2-VX-N01 (WITH TWO CONNECTORS)

Here shown is the cable-type displacement converter with an electrical connection with two connectors

Dimensions in mm



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

(2) Sensor connector M12, 5-pole, socket, A-coded, not aligned

MATERIALS USED AT CONVERTER

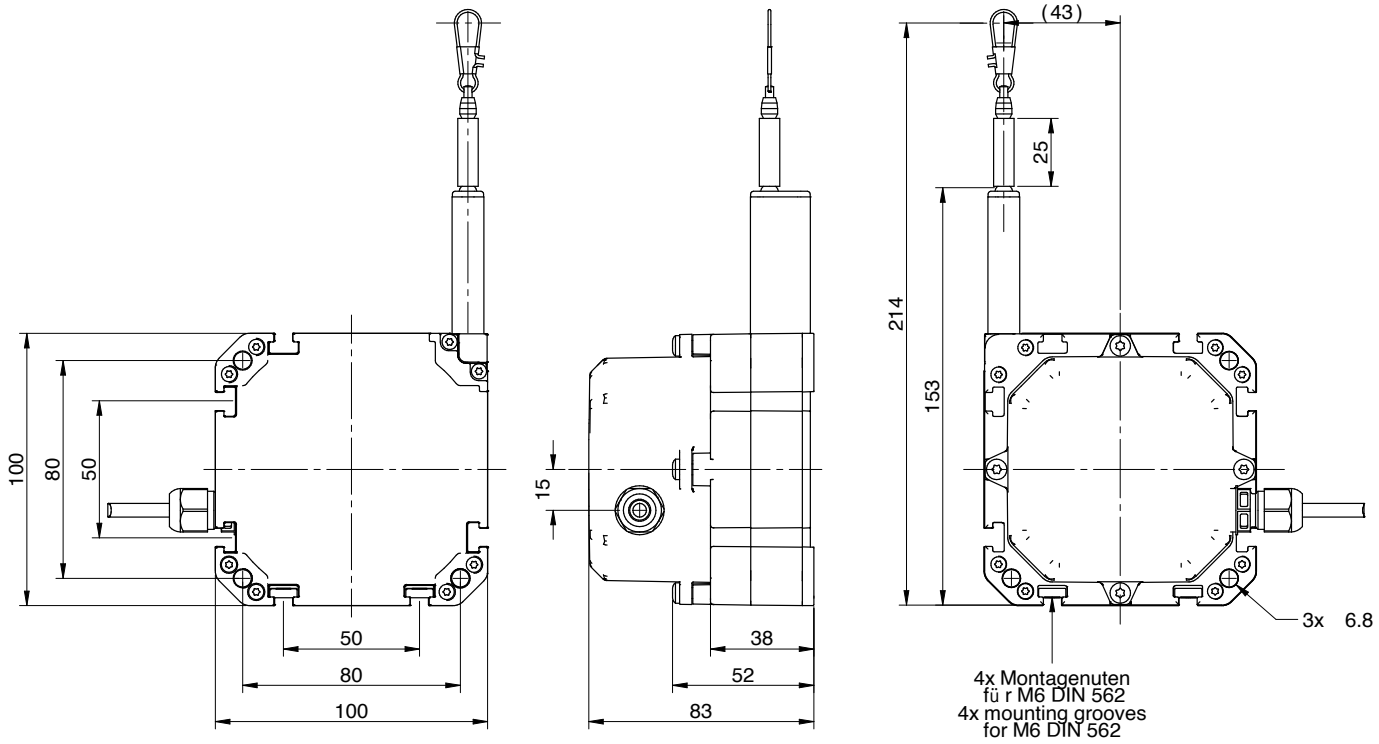
Housing . . . . . PA 6

INSTALLATION DRAWINGS

SWEKN-X-XX- K1-VX-N01 (WITH ONE CABLE)

Here shown is the cable-type displacement converter with an electrical connection with one cable (standard length 1 metre)

Dimensions in mm



MATERIALS USED AT CONVERTER

Housing . . . . . PA 6