DRAW WIRE SENSOR

Series SX50

Key-Features:

- Measurement ranges 50 mm up to 1250 mm
- Analog Output: Potentiometer, 0...10 V, 4...20 mA
- Teachable Outputs: 0...5 V, 0...10 V, with an additional Open-Collector switching output
- Digital Output Incremental: RS422 (TTL), Push-Pull
- Digital Output Absolute: CANopen, SSI
- Linearity up to ±0.02% of full scale
- Protection class up to IP67
- Temperature range: -20...+85 °C (optional -40 °C or +120 °C)
- High dynamics
- High interference immunity factor
- Customised versions available

Content:

29.03.18

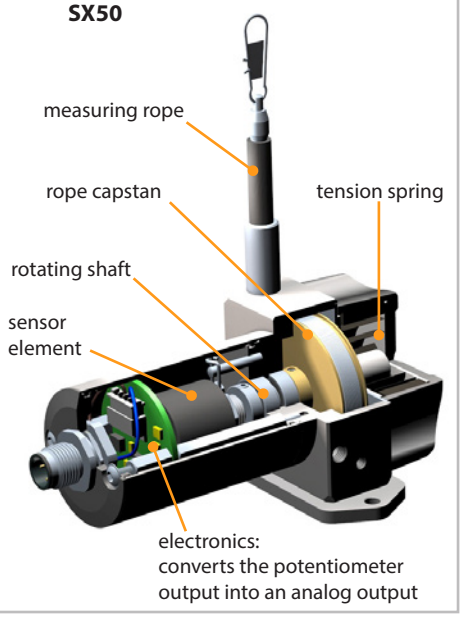
WayCon Positionsmesstechnik

INTRODUCTION

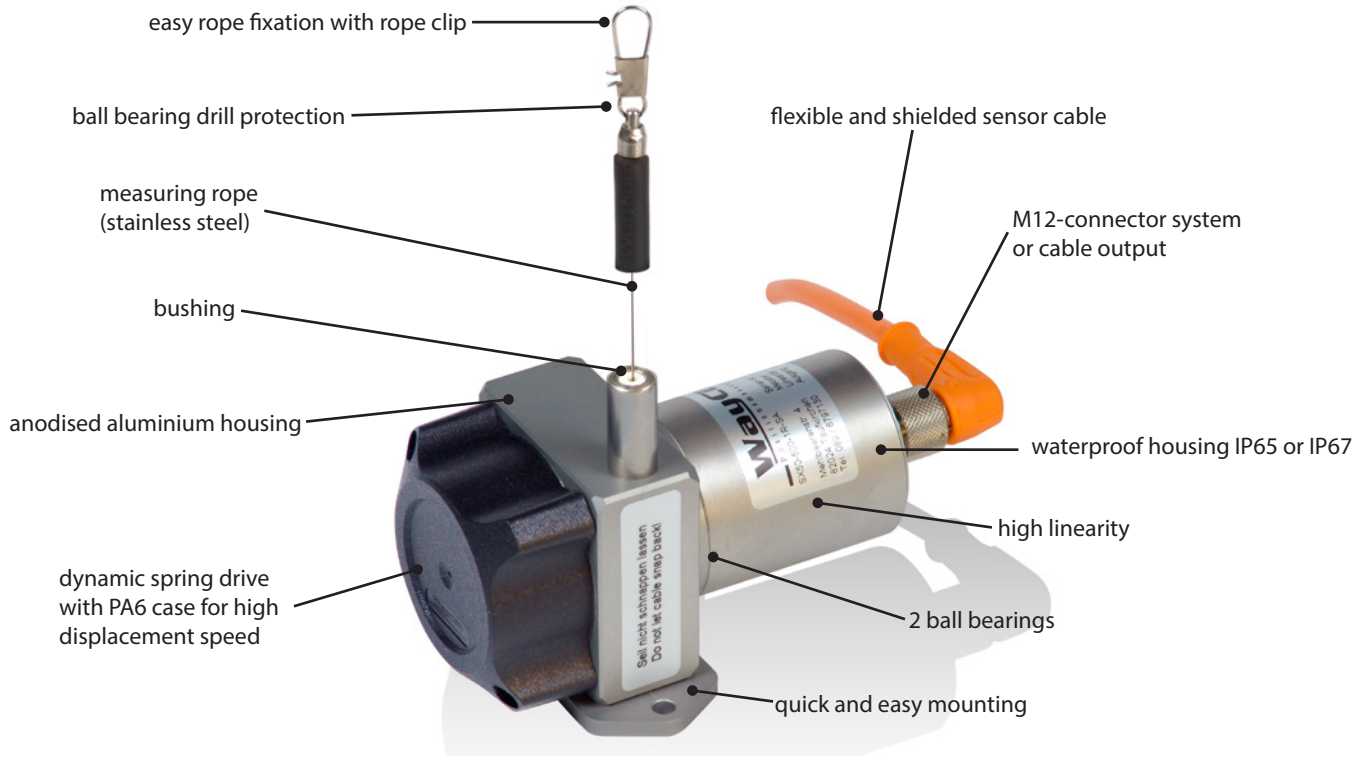
WayCon Positionsmesstechnik GmbH is a manufacturer of high quality draw wire position sensors for industrial use. Due to its small overall size, its short assembly time and its possible customisation, the SX sensor technology is a cost-effective and flexible solution for a wide range of industrial applications. The dynamics of the draw wire transducer allows a high motion speed and acceleration of the measuring target. Its rugged design and high quality makes applications in harsh industrial environments possible. Special instruments are available with mounting service of encoder on site, as well as customised versions of housing.

Sensor principle:
The key component of a draw wire sensor is a highly flexible steel wire rope, that is winded single-layered on an ultra-light capstan. This capstan is connected to the sensor housing by a pre-stressed spring. The end of the steel wire rope, that is equipped with a rope clip gets connected to the target object. As soon as the distance between sensor and target object changes, the steel wire rope gets pulled out of the sensor and is rolled off the capstan (or vice versa). The shaft of the capstan is connected to a potentiometer (for analog output signals), or to an encoder (for digital output signals). If there is a rotation of the capstan due to a change in the distance to the target object, the sensor element will turn proportionally. This way the potentiometer, or the encoder converts a linear movement into a proportional electrical signal. If a standard analog output signal, like 0...10 V or 4...20 mA is needed, the sensor is equipped with additional electronics.

SX50



OVERVIEW OF FEATURES



WARNING NOTICES

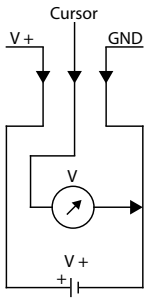
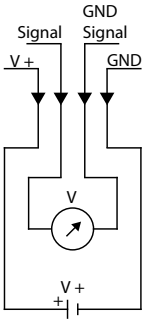
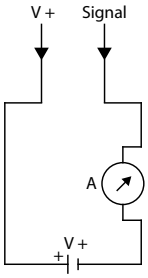
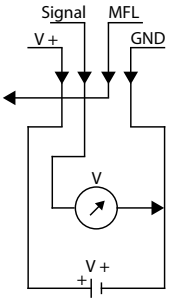
- Don't let the rope snap back. If the rope is retracted freely, this may lead to injuries (whiplash effect) and the device may be damaged. Caution when unhooking and retracting the rope into the sensor.
- Never exceed the specified measurement range when extracting the rope!
- Do not try to open the device. The stored energy of the spring drive may lead to injuries when being mishandled.
- Do not touch the rope when operating the sensor.
- Avoid guiding the rope over edges or corners. Use a deflection pulley instead.
- Do not operate the sensor if the rope is buckled or damaged. A ripping of the rope may lead to injuries or a damaging of the sensor.

TECHNICAL DATA ANALOG OUTPUT

Measurement range [1]	[mm]	50	75	100	125	150	225	250	300	375	500	625	750	1000	1250
Linearity	[%]	±0.5				±0.15							±0.1		
improved linearity (optional)	[%]	-				±0.1							±0.05		
improved linearity (optional) [2]	[%]	±0.1				-									
Resolution		see output types below													
Sensor element		Hybrid Potentiometer													
Connection		connector output M12 axial or cable output axial (TPE cable, standard length 2 m)													
Protection class		IP65, optional IP67													
Humidity		maximum 90 % relative, no condensation													
Temperature	[°C]	standard: -20...+85 / optional: -40...+85 / optional: -20...+120 °C (only with Potentiometer (1R) and cable output)													
Mechanical data		extraction force, maximum velocity and maximum acceleration see „mechanical data“													
Weight	[g]	300 to 500, depending on the measurement range													
Housing		aluminium, anodised, spring case PA6													

[1] other ranges on request
[2] special version with unprotected potentiometer, protection class IP40 (please contact the WayCon sales team)

ELECTRICAL DATA ANALOG OUTPUTS

	Potentiometer 1 kΩ	**Voltage 0...5 V, 0...10 V**	**Current 4...20 mA**	**Voltage 0...5 V, 0...10 V (teachable up to 50 % MR)**
Output	1 kΩ	0...5 V, 0...10 V, galvanically isolated, 4 conductors	4...20 mA, 2 conductors	0...5 V, 0...10 V, 3 conductors
Supply	max. 30 V	12...30 VDC		8...35 VDC
Recommended cursor current	< 1 µA	-		
Current consumption max.	-	22,5 mA (unloaded)	-	
Current consumption max.	-	-	-	150 mW
Output current	-	max. 10 mA, min. load 10 kΩ	max. 50 mA in case of error	max. 10 mA, min. load 1 kΩ
Dynamics	-	< 3 ms from 0...100 % and 100...0 %	< 1 ms from 0...100 % and 100...0 %	1 ms
Resolution	theoretically unlimited, limited by the noise			1 mV
Noise	dependent on the quality of the power supply	3 mV_{pp} typical, max. 37 mV_{pp}	0.03 mA_{pp} = 6 mV_{pp} at 200 Ω	3 mV_{pp} typical, max. 37 mV_{pp}
Inverse-polarity protection	-	yes, infinite		
Short-circuit proof	-	yes, permanent	-	yes, permanent
Working temperature	-20...+85 °C / optional: -40...+85			
Temperature coefficient	± 0.0025 %/K	0.0037 %/K	0.0079 %/K	0.0016 %/K
Elektromagnetic compatibility (EMC)	-	according to EN 61326-1:2006		
Circuit				

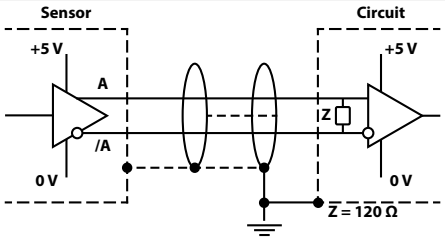
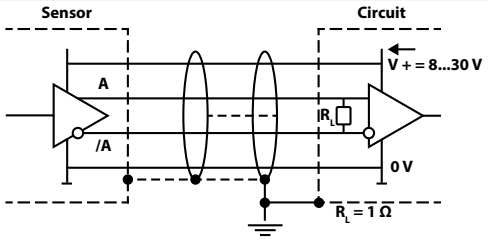
MFL = multi-functional line

TECHNICAL DATA DIGITAL OUTPUT INCREMENTAL

Measurement range *	[mm]	500	750	1250
Linearity	[%]	±0.05 (independent of the measurement range)		
Improved linearity (optional)	[%]	±0.02 (independent of the measurement range, only in combination with resolution 20 pulses/mm, or higher)		
Selectable resolution *	[Pulses/mm]	1; 4; 10; 28,8; 60 ** (the resolution can be raised by the factor 4 using quadruple edge detection)		
Z-Pulse distance	[mm]	125		
Sensor element		Incremental-Encoder with optical code disk		
Output signal		A, B and Z pulse (plus inverted pulses /A, /B and /Z)		
Connection		connector output M12 or cable output (PVC, standard length 2 m)		
Protection class		IP65, optional IP67		
Humidity		maximum 90 % relative, no condensation		
Temperature range	[°C]	-20...+85		
Mechanical data		extraction force, maximum velocity and maximum acceleration see „mechanical data“		
Weight	[g]	300 to 500, depending on the measurement range		
Housing		aluminium, anodised, spring case PA6		

* others on request
** Special version (please contact the WayCon sales team)

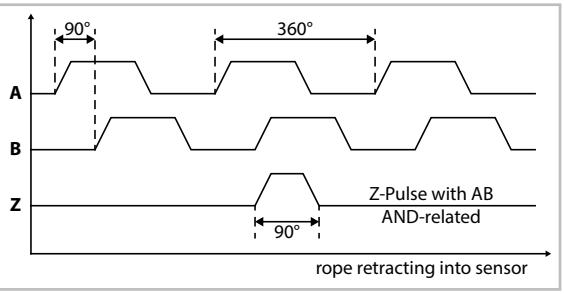
ELECTRICAL DATA DIGITAL OUTPUT INCREMENTAL

		Line driver L RS422 (TTL-compatible)	**Push Pull G**
Power supply V+	[VDC]	5, ±5 %	8...30
Current consumption (no load)	[mA]	typical 40, max. 90	max. 40
Load / Channel	[mA]	max. ±20	
Pulse frequency	[kHz]	max. 300	max. 200
Signal level high	[V]	min. 2.5	min. V+ - 3
Signal level low	[V]	max. 0.5	
Recommended circuit			

OUTPUT SIGNAL DIGITAL OUTPUT INCREMENTAL

Output signal
Pulses A and B are 90° phase-delayed (detection of direction). The Z-Pulse is emitted once per turn. The Z-Pulse distance is 125 mm (= circumference of the rope drum) and can be used as a reference mark.

(The diagram shows the signal without inverted signals; time line for return of rope.)



TECHNICAL DATA DIGITAL OUTPUT ABSOLUTE CANopen (WCAN)

Measurement range	[mm]	50	75	100	125	150	225	250	300	375	500	625	750	1000	1250
Linearity	[%]	±0.5				±0.15							±0.1		
Resolution		0.002 % of the measurement range													
Sensor element		Potentiometer													
Connection		connector output M12, 5 pins, axial (WCAN) or connector output M12, 8 pins, axial (WCANP)													
Protection class		IP65, optional IP67													
Humidity		maximum 90 % relative, no condensation													
Temperature	[°C]	Standard: -20...+85 / optional: -40...+85													
Mechanical data		extraction force, maximum velocity and maximum acceleration see „mechanical data“													
Weight	[g]	300 to 500, depending on the measurement range													
Housing		aluminium, anodised, spring case PA6													

ELECTRICAL DATA DIGITAL OUTPUT ABSOLUTE CANopen (WCAN)

CAN specification		Full CAN 2.0B (ISO11898)
Communication profile		CANopen CiA 301 V 4.2.0, Slave
Device profile		Encoder, absolute linear; CIA 406 V 3.2.0
Error control		Producer Heartbeat, Emergency Message, Node Guarding
Node ID		Default: 7, configurable via SDO and Squeezer (offline configuration) *
PDO		1 x TPDO, static mapping
PDO Modes		Event-triggered, Time-triggered, Sync-cyclic, Sync-acyclic
Transmission rate		1 Mbps, 800, 500, 250, 125, 50, 20 kbps configurable via SDO and Squeezer (offline configuration) *
Bus connection		M12 connector, 5 pins
Integrated Bus termination resistor		120 Ω, connectible via SDO and Squeezer (offline configuration) *
Bus, galvanic separation		No
Supply	[VDC]	8…30 VDC
Current consumption		10 mA typical at 24 V, 20 mA typical at 12 V
Measurement rate		1 kHz with 16-bit resolution
Repeatability	[%]	±0.5 %, ±0.25 % oder ±0.1 % (according to the selected linearity)
Electrical protection		inverse polarity protection
EMV		DIN EN61326-1:2013, conformity with directive 2014/30/EU

* Offline configuration via Squeezer only in combination with M12 connector 8 pins.
For more information on the offline configuration please refer to the CANopen manual.
For dimensions see technical drawing of analog output on page 7.

TECHNICAL DATA DIGITAL OUTPUT ABSOLUTE, CANopen (CAN), SSI

		CANopen (CAN)	SSI
Measurement range	[mm]	500, 750, 1250	
Linearity	[%]	±0.05 (independent of the measurement range)	
Resolution scalable (with Software)		yes	no
Standard resolution	[Pulse/mm]	65.54 (corresponds to 0.015 mm [13 bit])	32.77 (corresponds to 0.03 mm [12 bit])
Maximum resolution	[Pulse/mm]	524.9 (corresponds to 0.019 mm [16 bit])	-
Sensor element		Multiturn-Absolute-Encoder with optical code disk	
Connection		cable output tangential, with 1 or 5 m PUR cable *	
Power supply	[VDC]	10...30 (reverse polarity protection of the power supply)	
Current consumption (no load, at 24 VDC)	[mA]	max. 80	max. 30
Protection class		IP65, optional IP67	
Humidity		max. 90 % relative, no condensation	
Temperature	[°C]	-20...+85	
Mechanical data		extraction force, maximum velocity and maximum acceleration see „mechanical data“	
Weight	[g]	300 to 500, depending on the measurement range	
Housing		aluminium, anodised, spring case PA6	

* CANopen only: The sum of all the drop lines should not, for a particular baud rate, exceed the maximum length Lu.
Lu < 5 m cable length for 125 Kbit Lu < 2 m cable length for 250 Kbit Lu < 1 m cable length for 1 Mbit

ELECTRICAL DATA DIGITAL OUTPUT ABSOLUTE, CANopen (CAN), SSI

Parameters of the CANopen Interface (CAN)	
Code	Binary
Interface	CAN High-Speed acc. to ISO 11898, Basic- and Full-CAN, CAN Specification 2.0 B
Protocol	CANopen profile DS406 V3.2 with manufacturer-specific add-ons LSS-Service DS305 V2.0
Baud rate	10 ... 1000 kbit/s (Software configurable)
Node address	1...127 (Software configurable)
Termination	Software configurable
LSS Protocol	CIA LSS protocol DS305, Global command support for node address and baud rate, Selective commands via attributes of the identity object

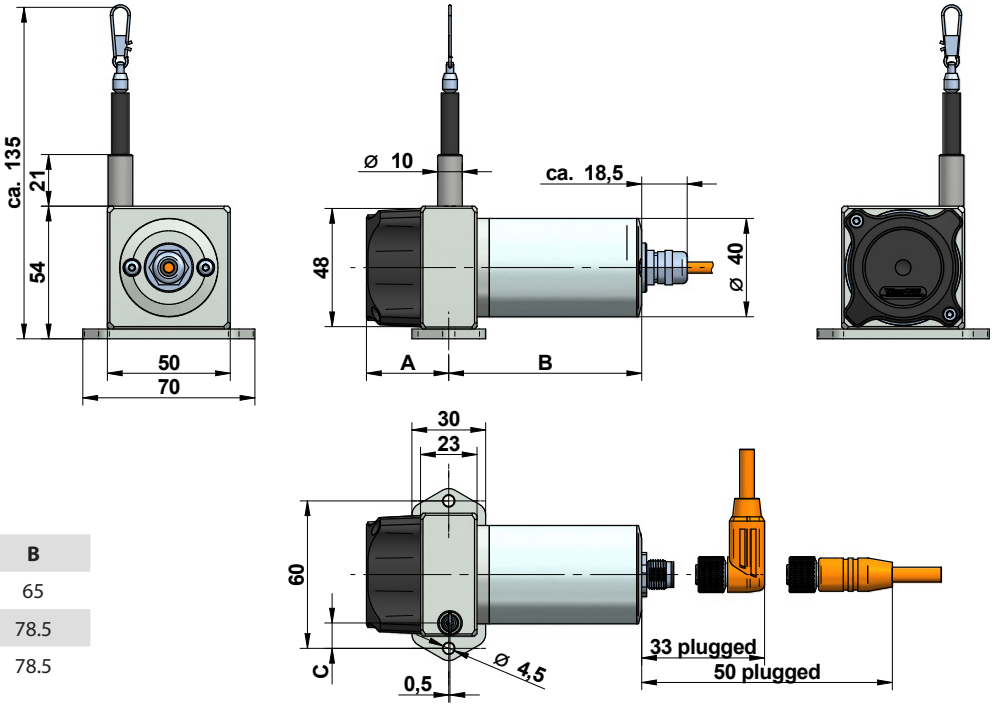
Parameters of the SSI interface	
Code	Gray
Output driver	RS485 Transceiver-Typ
Permissible load / channel	max. ±30 mA
Signal level	HIGH: typ 3.8 V, LOW: with I_{Load} = 20 mA typ 1.3 V
Resolution	12 bit
SSI clock rate	ST-resolution: 50 kHz...2 MHz
Monoflop time	≤ 15 µs
Data refresh rate	≤ 1 µs
Status and Parity bit	on request

MECHANICAL DATA

Measurement range	Extraction force		Speed*	Acceleration*	Increased extraction force: Option HG		Acceleration: Option HG
[mm]	F_{min} [N]	F_{max} [N]	V_{max} [m/s]	a_{max} [m/s²]	F_{min} [N]	F_{max} [N]	a_{max} [m/s²]
50	5.8	6.2	8,0	200	13.2	13.7	400
75	3.6	3.8	8,0	200	7.3	7.9	400
100	3.4	3.6	8,0	200	5.9	6.4	400
125	4.2	4.4	10,0	300	-	-	-
150	6.0	6.8	8,0	200	13.2	13.7	400
225	4.2	4.4	8,0	200	7.3	8.3	400
250	5.0	6.4	8,0	200	13.2	13.7	400
300	2.8	3.2	8,0	200	5.9	6.7	400
375	4.0	4.4	10,0	300	-	-	-
500	3.0	3.6	8,0	200	5.9	6.9	400
625	4.4	5.2	10,0	300	-	-	-
750	3.2	4.4	8,0	200	7.3	9.8	400
1000	2.8	3.4	8,0	200	5.9	7.9	400
1250	4.6	5.6	10,0	300	-	-	-

* reduced to 60 % when option IP67 is used

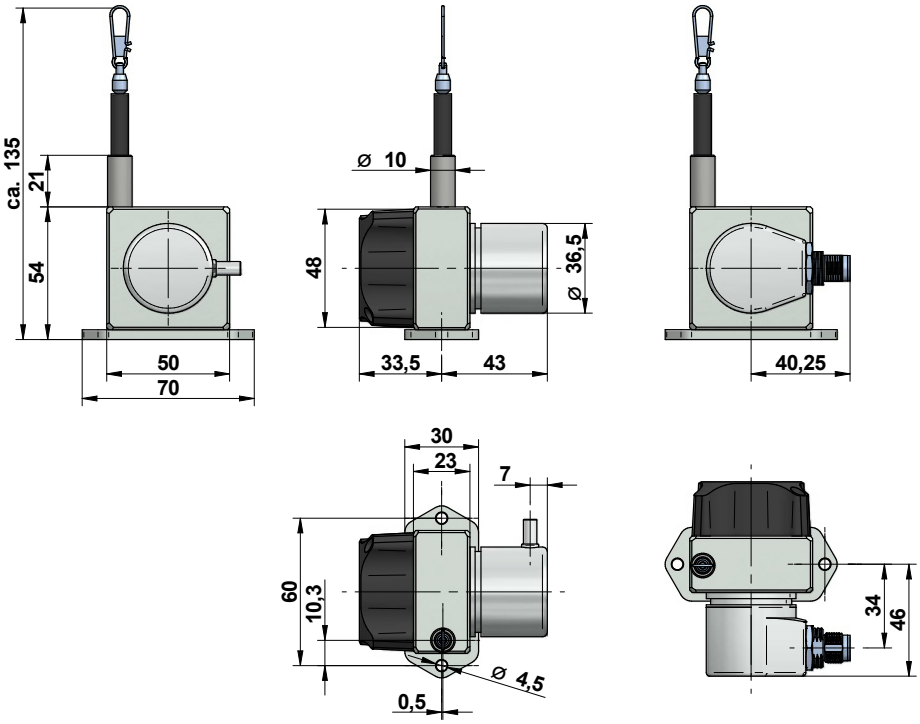
TECHNICAL DRAWING ANALOG OUTPUT AND DIGITAL OUTPUT WCAN



Output	B
Potentiometer	65
0...10 V / 4...20 mA	78.5
WCAN	78.5

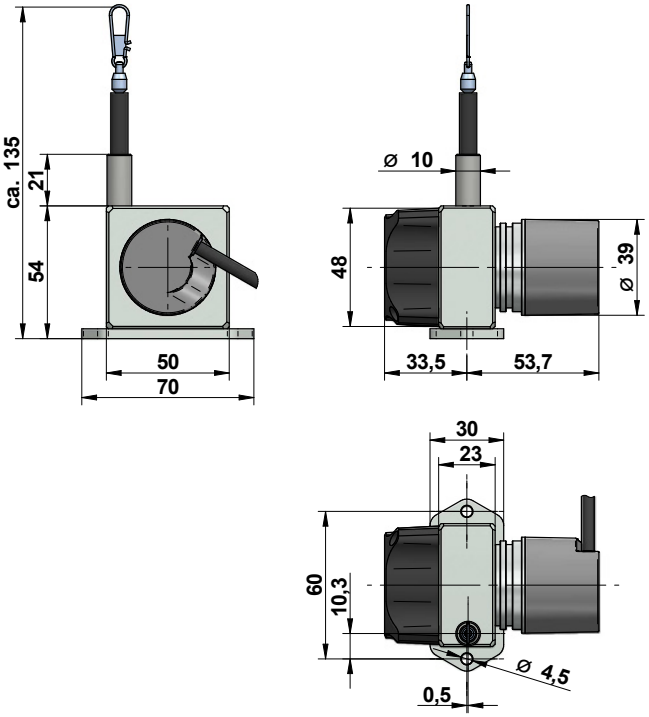
Measurement range	Option	A	C
50 / 150 / 250 mm	Standard	26.5	21.3
75 / 225 / 750 mm	Standard	26.5	17
100 / 300 / 500 / 1000 mm	Standard	26.5	12.75
125 / 375 / 625 / 1250 mm	Standard	33.5	10.3
50 / 150 / 250 mm	HG(50)	33.5	21.3
75 / 225 / 750 mm	HG(50)	33.5	17
100 / 300 / 500 / 1000 mm	HG(50)	33.5	12.75

TECHNICAL DRAWING DIGITAL OUTPUT INCREMENTAL

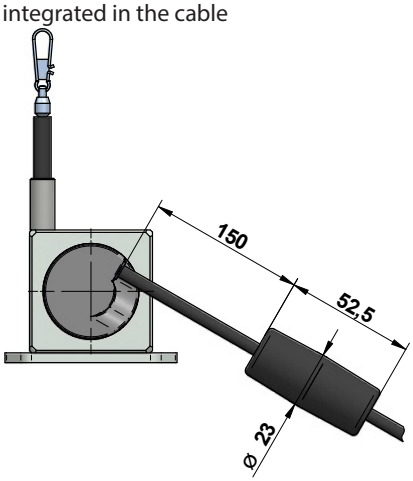


Option	A
Standard	33.5

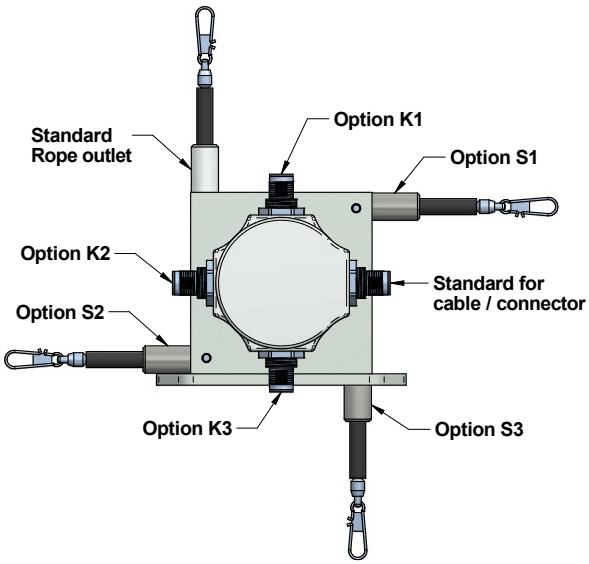
TECHNICAL DRAWING DIGITAL OUTPUT ABSOLUTE CANopen (CAN), SSI



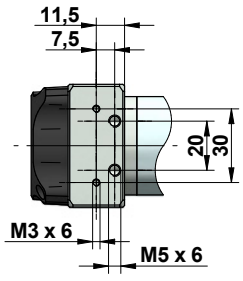
Detailed view: battery (data storage) integrated in the cable



TECHNICAL DRAWING OPTIONS CHANGED ROPE OUTLET AND CABLE OUTPUT

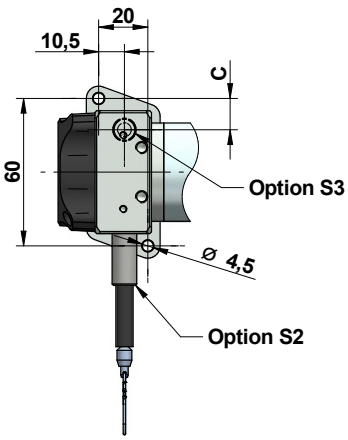


Mounting: standard rope outlet, rope outlet sideways top (S1)
The sensor is usually installed by using the regular mounting plate (see technical drawing above). By disassembling the mounting plate, there are 4 threads (2 x M3, 2 x M5) in the sensor housing for alternative installation.



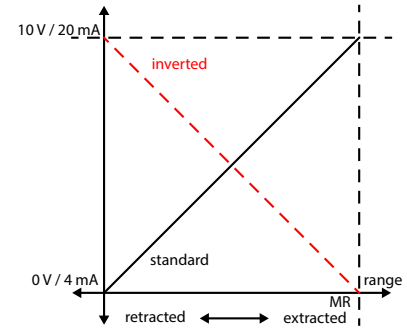
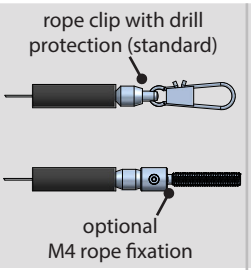
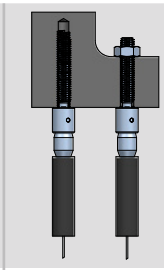
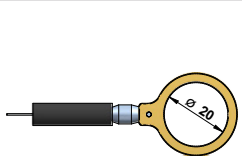
Mounting: rope outlet sideways bottom (S2), rope outlet bottom (S3)
Sensors with option rope outlet S2 and S3 have a modified base plate:

Measurement range	Option	C
50 / 150 / 250 mm	Standard	21.3
75 / 225 / 750 mm	Standard	17
100 / 300 / 500 / 1000 mm	Standard	12.75
125 / 375 / 625 / 1250 mm	Standard	10.3
50 / 150 / 250 mm	HG(50)	21.3
75 / 225 / 750 mm	HG(50)	17
100 / 300 / 500 / 1000 mm	HG(50)	12.75



OPTIONS

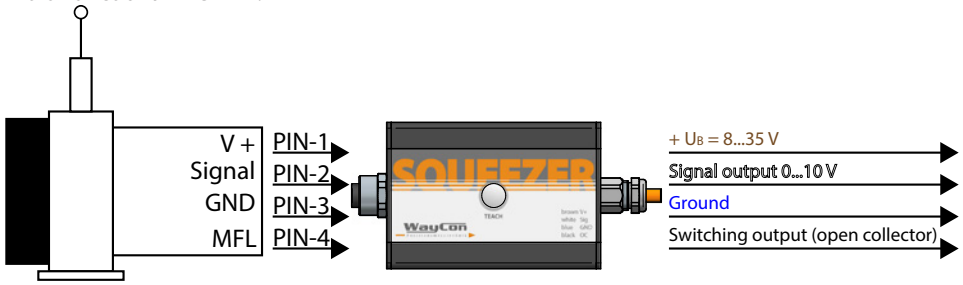
The following table gives an overview of frequently used options, with which the standard sensors can be equipped. Please pay attention that not all options can be combined. Information on possible combinations can be found in the order codes.

Option	Order code	Description
Changed cable or connector orientation (NOT with analog output)	K1, K2, K3	Rope outlet points upwards (see drawing on page 8): Standard: sideways, opposite to the rope outlet K1: at the top K2: sideways, same side as the rope outlet K3: at the bottom
Improved linearity	L02, L05, L10	Improved linearity 0.02 % (L02), 0.05 % (L05) or 0.1 % (L10)
Inverted output signal (analog output only)	IN	The analog signal of the sensor is increasing by extracting the rope (standard). Option IN inverts the signal, i.e. the signal of the sensor declines by extracting the rope. 
Changed rope outlet (see drawing on page 8)	S1, S2, S3	S1: rope outlet sideways at the top S2: rope outlet sideways at the bottom (modified mounting plate, see page 8) S3: rope outlet on the bottom (modified mounting plate, see page 8)
Synthetic wire rope (instead of stainless steel wire rope)	COR	Synthetic wire rope, made out of abrasion resistant and enhanced Coramid. (not available for ranges 50/150/250/750/1000/1250 mm)
Rope fixation by M4 thread	M4	Optional, pivoted rope fixation with screw thread M4, length 22 mm. Ideal for attachment to through holes or thread holes M4.  
Rope fixation by eyelet	RI	The end of the wire rope is equipped with a eyelet instead of a rope clip. Inside diameter 20 mm  
Protection class IP67	IP67	Use option IP67, if the sensor will operate in a humid environment. Note that with this option there may occur a light hysteresis in the output signal due to the special sealing. The max. acceleration and displacement speed are reduced to 60 % of the specified value.
Corrosion protection	CP	Includes a V4A wire rope, stainless steel bearings and option M4. The sensors rope drum gets HARTCOAT® coated. This coating is a hard-anodic oxidation that protects the sensor from corrosion by aggressive media (e. g. sea water) with a hard ceramics-like layer.
Increased corrosion protection (analog output only)	ICP	Components of the housing and the rope drum get HARTCOAT® coated. Includes the options CP, IP67 and M4.
Increased extraction force (analog output only)	HG	A reinforced spring drive provides a greater rope tension and allows a higher rope acceleration. Please note the different dimensions of the housing. (not available for ranges 125/375/625/1250 mm)
Increased temperature range High (potentiometer 1R only)	T120	Sensors with potentiometer output (1R) and cable output can be operated from -20 to +120 °C when this option is used. (NOT in combination with voltage-, current- or digital output signals)
Increased temperature range Low (analog output only)	T40	Special components and a low temperature grease make a working temperature down to -40 °C (up to +85°C) possible.

ACCESSORY SQUEEZER FOR TEACHABLE OUTPUTS 5VT AND 10VT

Draw wire sensors with the analogue output versions 5VT and 10VT are equipped with teachable, internal electronics, called VT-Electronics. The signals provided by the sensor's potentiometer are digitized by the VT-Electronics. This digital information is first processed by the electronics, then transformed back and given out as an analogue output signal 0 to 5 V or 0 to 10 V.
The digitization offers two possibilities of adjustment, by which the sensor can be configured individually using the Squeezer:

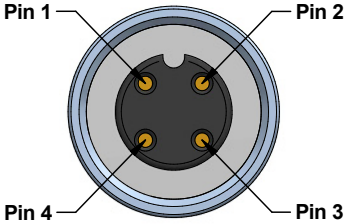
1. Teaching of the measurement range. After a successful teaching process, the squeezer can be pulled off the sensor and be replaced by a standard cable or connector.
2. Setting an individual switching point. The squeezer allows the setting of an individual switching point open collector. The switching signal is emitted through the multi-functional line MFL.



A detailed description of the functions can be found in a separate manual.

Electrical connection Squeezer

Accessory:
Connection cable sensor to Squeezer:
K4P1,5M-SB-M12



Connector (to sensor)	
PIN 1	V +
PIN 2	Signal
PIN 3	GND
PIN 4	MFL*

MFL = multi-functional line

Cable ends (to PLC)	
BN	V +
WH	Signal
BU	GND
BK	NPN*

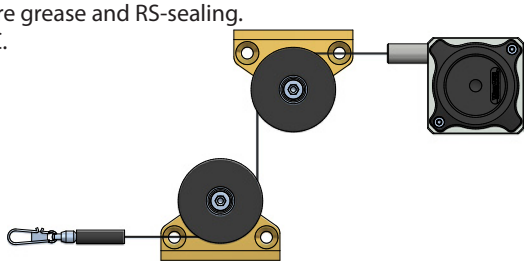
* The open collector is a NPN switching output

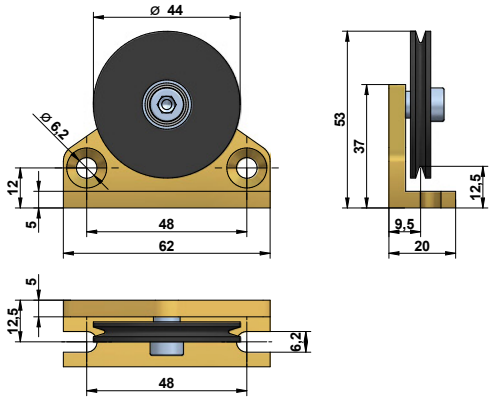
GENERAL ACCESSORIES

Deflection pulley - UR2

The rope must be extracted from the sensor vertically. The maximum variation from the vertical is 3°. A deflection pulley allows a change in the direction of the wire rope. Several pulleys may be used. The rope clip must not be guided over the deflection pulley.

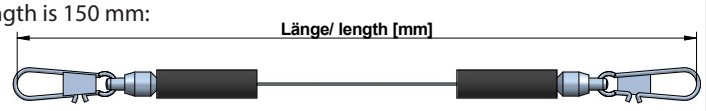
Material foot: anodised aluminium
Material rope wheel: POM-C
Mounting: by 2 hexagon socket or countersunk screws M6, vertical or horizontal mounting possible. Ball bearings: with special low temperature grease and RS-sealing.
Temperature: -40...+80 °C.





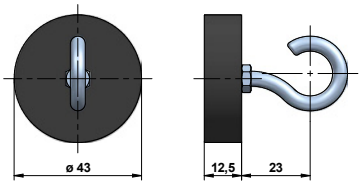
Rope extension - SV

For bridging a greater distance between the measuring target and the sensor a rope extension can be applied. The rope clip must not be guided over the deflection pulley.
Please specify the length needed in your order (XXXX). The minimum length is 150 mm:
SV1-XXXX: rope extension (150...4995 mm)
SV2-XXXX: rope extension (5000...19995 mm)
SV3-XXXX: rope extension (20000...40000 mm)



Magnetic clamp - MGG1

Use the magnetic clamp to quickly attach the rope to metallic objects without any assembly time. A rubber coating provides gentle contact (e. g. on varnished surfaces) and prevents from slipping due to vibration. The magnet consists of a neodym core for an increased adhesive force of 260 N. The hook makes it easy to attach the rope clip.



ORDER CODE ANALOG OUTPUT

SX50 — □ — □ — □ — □

Measurement range [mm] 50 / 75 / 100 / 125 / 150 / 225 / 250 / 300 / 375 / 500 / 625 / 750 / 1000 / 1250	e. g. 500

Output signal		
Potentiometer	1 kΩ	1R
Voltage	0...10 V	10V
Voltage	0...5 V (teachable)	5VT
Voltage	0...10 V (teachable)	10VT
Current	4...20 mA	420A

Connection	
Connector output M12, axial, 4 pins	**SA12**
Cable output, axial [1]	KA_ _

Version	
Standard	-
Sensor with options	O

[1] Length in m (Minimum 2 m)
Examples: KR02 = 2 m, KR05 = 5 m
Bold text: standard with shorter lead time

Option	Description
L05	improved linearity ±0.05 %
L10	improved linearity ±0.1 %
IN	inverted output signal
S1	rope outlet sideways top
S2	rope outlet sideways bottom
S3	rope outlet bottom
COR	synthetic wire rope (Coramid)
M4	rope fixation M4 thread
RI	rope fixation eyelet
IP67	protection class IP67
CP	corrosion protection
ICP	increased corrosion protection
HG	increased extraction force
T120	increased temperature range -40...+85°C
T40	increased temperature range -20...+120 °C

Option	not combinable with
L05, L10	T40
COR	MR 50/150/250/750/1000/1250
M4	CP, ICP
RI	CP, ICP
IP67	HG, T120, ICP
CP	M4, RI
ICP	IP67, M4, RI
HG	IP67, MR 125/375/625/1250
T120	IP67, CP, ICP, COR, SA12, 10V, 5VT, 10VT, 420A
T40	L05, L10

ORDER CODE DIGITAL OUTPUT INCREMENTAL

SX50 — □ — □ — □ — □ — □

Measurement range [mm] 500 / 750 / 1250	e. g. 500

Resolution [Pulses/mm] 1 / 4 / **10** / **20** / 28.8	e. g. 20

Output signal	
Line driver RS422 (TTL)	**L**
Push-Pull (HTL)	**G**

Connection	
Connector output M12, radial, 8 pins	**SR12**
Cable output, radial [1]	KR_ _

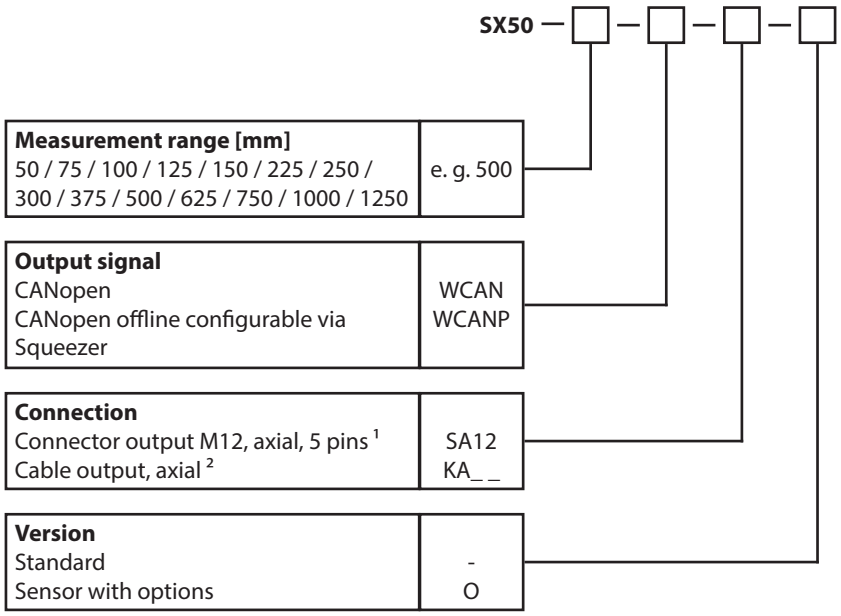
Version	
Standard	-
Sensor with options	O

[1] Length in m (Minimum 2 m)
Examples: KR02 = 2 m, KR05 = 5 m
Bold text: standard with shorter lead time

Option	Description
K1	cable/connector orientation top
K2	cable/connector orientation left
K2	cable/connector orientation bottom
L02	improved linearity ±0.02 %
S1	rope outlet sideways top
S2	rope outlet sideways bottom
S3	rope outlet bottom
COR	synthetic wire rope (Coramid)
M4	rope fixation M4 thread
RI	rope fixation eyelet
IP67	protection class IP67
CP	corrosion protection

Option	not combinable with
L02	resolution 1 / 4 / 10
COR	MR 750 / 1250
M4	CP
RI	CP
CP	M4, RI

ORDER CODE DIGITAL OUTPUT ABSOLUTE CANopen (WCAN)

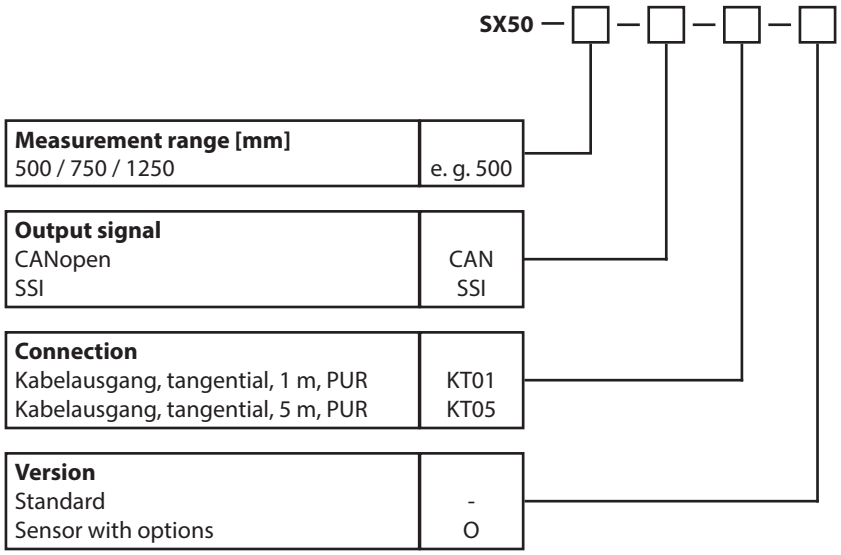


[1] 8 pins in combination with WCANP
[2] Length in m (Minimum 2 m)
Examples: KR02 = 2 m, KR05 = 5 m

Option	Description
S1	rope outlet sideways top
S2	rope outlet sideways bottom
S3	rope outlet bottom
COR	synthetic wire rope (Coramid)
M4	rope fixation M4 thread
RI	rope fixation eyelet
IP67	protection class IP67
CP	corrosion protection
ICP	increased corrosion protection
HG	increased extraction force
T40	increased temperature range -40...+85°C

Option	not combinable with
L05, L10	T40
COR	MR 50/150/250/750/1000/1250
M4	CP, ICP
RI	CP, ICP
IP67	HG, T120, ICP
CP	M4, RI
ICP	IP67, M4, RI
HG	IP67, MR 125/375/625/1250
T40	L05, L10

ORDER CODE DIGITAL OUTPUT ABSOLUTE CANopen, SSI



Option	Description
K1	cable/connector orientation top
K2	cable/connector orientation left
K3	cable/connector orientation bottom
S1	rope outlet sideways top
S2	rope outlet sideways bottom
S3	rope outlet bottom
COR	synthetic wire rope (Coramid)
M4	rope fixation M4 thread
RI	rope fixation eyelet
IP67	protection class IP67
CP	corrosion protection

Option	not combinable with
COR	MR 750/1250
M4	CP
RI	CP
CP	M4, RI

GENERAL ACCESSORIES

SQUEEZER2M	accessory for VT or WCANP output, 2 m cable
SQUEEZER5M	accessory for VT or WCANP output, 5 m cable
SQUEEZER10M	accsy for VT or WCANP output, 10 m cable
UR2	deflection pulley

MGG1	magnetic clamp
SV1-XXXX	rope extension (150 mm up to 4995 mm)
SV2-XXXX	rope extension (5000 mm up to 19995 mm)
SV3-XXXX	rope extension (20000 mm up to 40000 mm)

ACCESSORIES ANALOG OUTPUT

Cable with mating connector M12, 4 poles, shielded	
K4P2M-S-M12	2 m, straight connector
K4P5M-S-M12	5 m, straight connector
K4P10M-S-M12	10 m, straight connector
K4P2M-SW-M12	2 m, angular connector
K4P5M-SW-M12	5 m, angular connector
K4P10M-SW-M12	10 m, angular connector

Mating connector M12, 4 poles, shielded	
D4-G-M12-S	straight, M12 for self assembly
D4-W-M12-S	angular, M12 for self assembly

Connection cable sensor to Squeezer	
K4P1,5M-SB-M12	1.5 m, 4-pole, shielded

ACCESSORIES DIGITAL OUTPUT INCREMENTAL

Cable with mating connector M12, 8 poles, shielded	
K8P2M-S-M12	2 m, straight connector
K8P5M-S-M12	5 m, straight connector
K8P10M-S-M12	10 m, straight connector
K8P2M-SW-M12	2 m, angular connector
K8P5M-SW-M12	5 m, angular connector
K8P10M-SW-M12	10 m, angular connector

Mating connector M12, 8 poles, shielded	
D8-G-M12-S	straight, M12 for self assembly
D8-W-M12-S	angular, M12 for self assembly

ACCESSORIES DIGITAL OUTPUT ABSOLUTE CANopen (WCAN)

Cable for WCAN with mating connector M12, 5 poles, shielded	
K5P2M-S-M12	2 m, straight connector
K5P2M-SW-M12	2 m, angular connector

Connection cable sensor to Squeezer for WCANP	
K48P03M-SB-M12	0.3 m, shielded, 8 poles to 4 poles

Cable for WCANP with mating connector M12, 8 poles, shielded	
K8P2M-S-M12	2 m, straight connector
K8P2M-SW-M12	2 m, angular connector

Adapter cable WCANP to CAN-Bus	
K58P03M-SB-M12	0.3 m, shielded, 8 poles to 5 poles

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