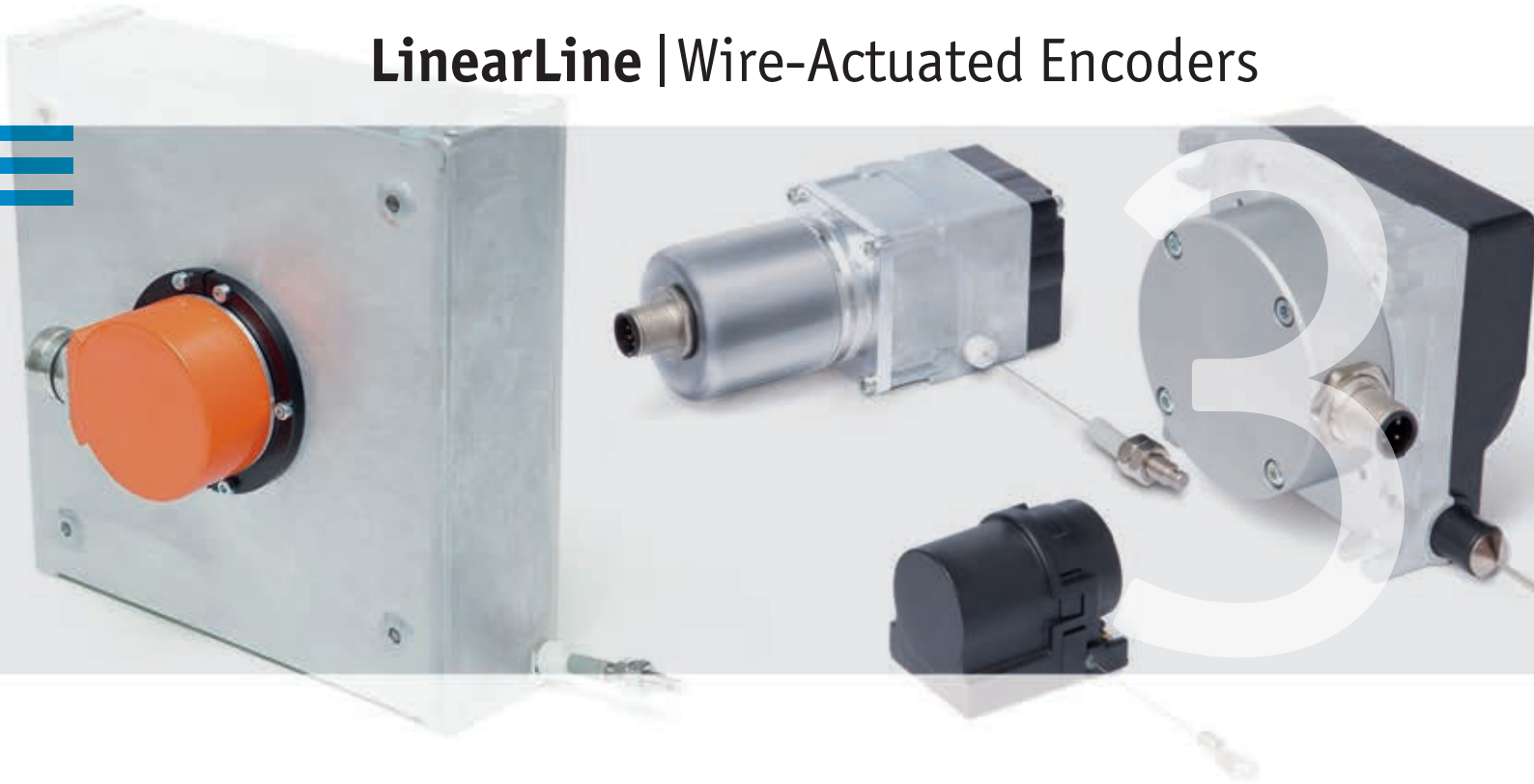


LinearLine | Wire-Actuated Encoders





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3.5



3.1

With a clear vision for the future!

Today SIKO can look back over five decades of experience in the production of measuring instruments for length, angle and speed measurement as well as the measurement of tilt angles and speed. With these core competencies as its foundation, SIKO develops and produces measuring instruments and positioning systems for automation and manufacturing processes that are geared to the future.

The highest demands of our customers from the industry and the mechanical engineering sector are more than met by the quality, precision and functionality of our products and services.

SIKO is certified to DIN EN ISO 9001 : 2008. In our company sustainable use of resources is a matter of course.

Six product ranges - a wide portfolio for very different measuring assignments

The SIKO product portfolio comprises a total of six ranges, including high-quality measuring instruments and positioning systems for the industry and the mechanical engineering sector.

We develop sensor systems for measured value acquisition either for you or in collaboration with your company. Shorter tooling times and the optimization of manufacturing and production processes are often the centre of focus.

OEM customers, projects and special solutions, retrofits or spare parts supplies directly to end users - all our customers are important!

6 distinctive product lines

PositionLine	mechanical and electronic position indicators, handwheels with analog displays, adjustment buttons
RotoLine	magnetic and optical rotary encoders, geared potentiometers
LinearLine	wire-actuated encoders, optical distance sensors
DriveLine	actuators
MagLine	magnetic length and angle measuring systems
OptoLine	high-precision optical sensors





3.1

Global success is never coincidental

Today the robust and innovative SIKO measuring instruments are in use in industrial and mechanical engineering installations around the world.

Five SIKO subsidiaries are at your disposal in the following countries:

- U.S.A.
- Italy
- Switzerland
- China
- Singapore

In addition, around 60 national and international agencies are on the spot for direct customer contact and technical support. Sales engineers and service technicians support OEM customers as well as users at their own facilities, providing competent advice and services in the respective national languages.



Horst Wandres & Sven Wischnewski | Management of SIKO GmbH





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3.2 | Wire-actuated Encoder

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- 3.5



Rotary encoders made by SIKO are optimally suited to wire-actuated technology. Custom-specific encoders can also be mounted thanks to standardized mechanical "interfaces".

The most flexible solution when the direct route goes round the corner

SIKO wire-actuated encoders are a perfect measurement solution thanks to their state-of-the-art, fail-safe technology and effortless integration. They are suitable for a wide range of measurement tasks under very varied conditions. Their sturdy design and wire types guarantee an exceptionally long, maintenance-free service life.

This is how the technology works

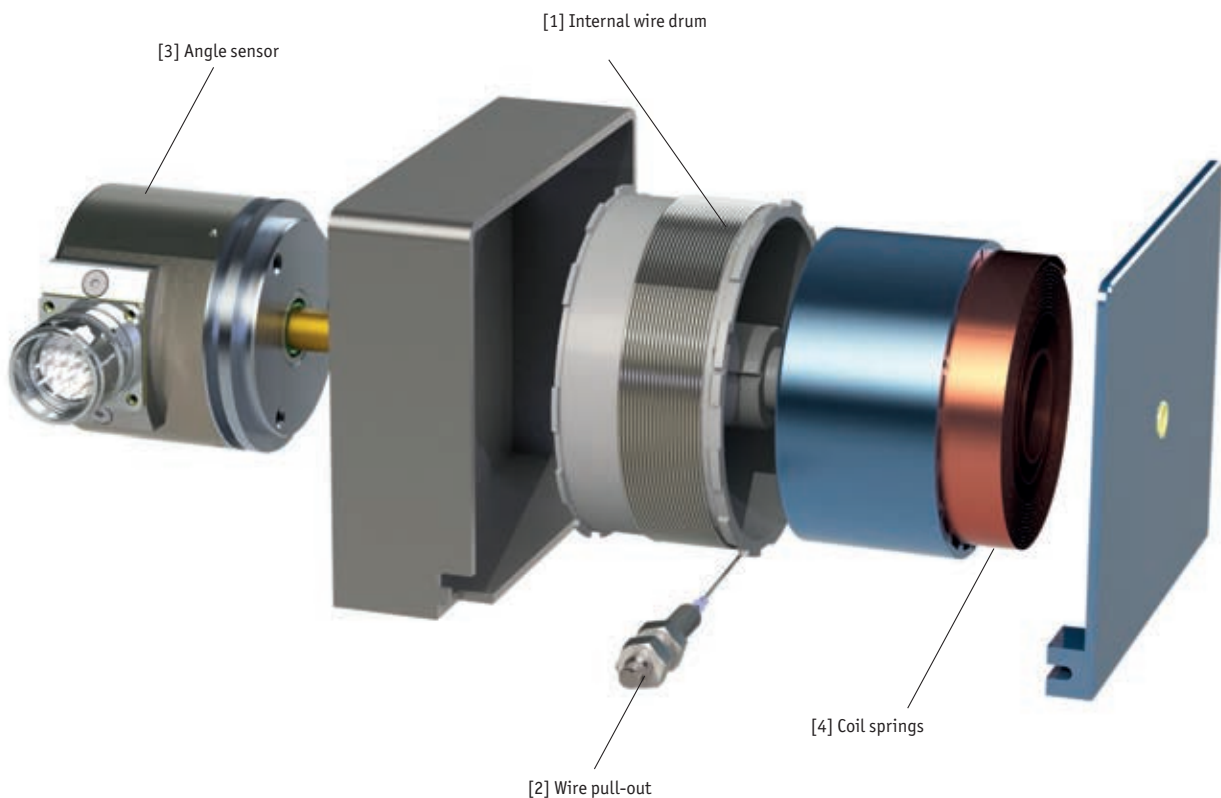
A single layer of measurement wire is wound onto an internal drum [1]. When the wire is pulled out [2], it causes the drum to rotate. The angle sensor [3] connected directly to the drum axle records this rotation and generates an arbitrarily usable measurement signal proportional to the wire movement. An integral coil spring [4] on the drum's rotation axis guarantees a safe wire return movement (see illustration). Mounting effort is low, as the wire is simply attached to the object to be measured. This means there is no need of additional guiding systems or installation of energy supply chains.

Moreover, the flexibility of the wire enables linear adjustments even at sites which are hard to reach. Indirect paths can also be measured by means of guide rollers.

A choice of incremental and absolute measuring principles is generally available. SIKO wire-actuated encoders cover almost the entire range of industrial applications - from compact versions in miniature format with a measurement length of 600 mm to solutions with wire pull-out lengths of 15 m.

Benefits

- Long service life thanks to consistent technological development and application-oriented choice of materials
- Excellent price-performance ratio
- Variable measurement lengths
- Easy adaptation of measuring transducers
- Standardized interfaces
- Problem-free, fast mounting



Areas of application

Measurement systems based on the “draw-wire” principle are easy to handle, since attaching the wire to the adjustment unit is quick and inexpensive.

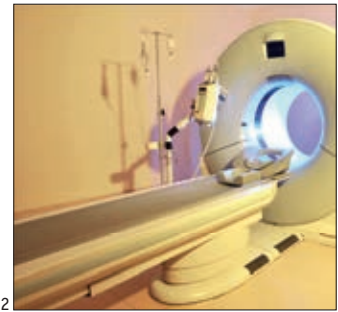
They also run reliably without additional mechanical protection, for example on elevating work platforms or forklift trucks. While during metal processing the dimension of the workpiece is measured with a wire cable when adjusting the end stop of mitre saws, wire cables are used for all measuring tasks in the illustrated material handling example.

SIKO’s miniature encoders are the logical answer to ongoing integration in industrial products and processes. The tiny encoders have a wide range of application: They are reliable monitors of positioning tasks for patient tables (medical technology), adjustment of seats (vehicle technology) or controlled deflection of chassis (aircraft technology).

With the SG120 and the SG150 for measuring distances of up to 15 metres, solutions in the work platform, warehouse and crane sectors have been implemented.



1



2

iStockphoto. Levent Komuk



3



4



6



5

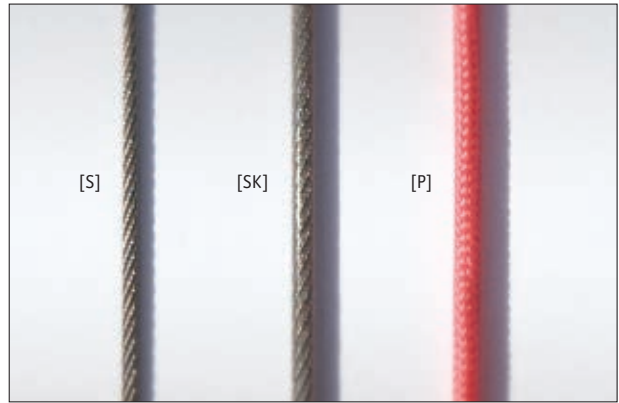
[1] Retrofitting with a wire-actuated encoder permits direct control of a set value for height and stroke. [2] Positioning of patient tables, for example on tomography systems, operating tables and X-ray equipment. [3, 4] Finding the correct placement area is decisive for a smooth workflow: Wire-actuated encoders are reliable measuring elements for the assignment of pre-defined storage areas. [5] For height adjustment and side positioning of the lifting fork of unmanned transport systems. [6] Reliable recording of the support and the telescopic cylinder for monitoring the maximum range with wire-actuated encoders, optionally of redundant design.

3.2

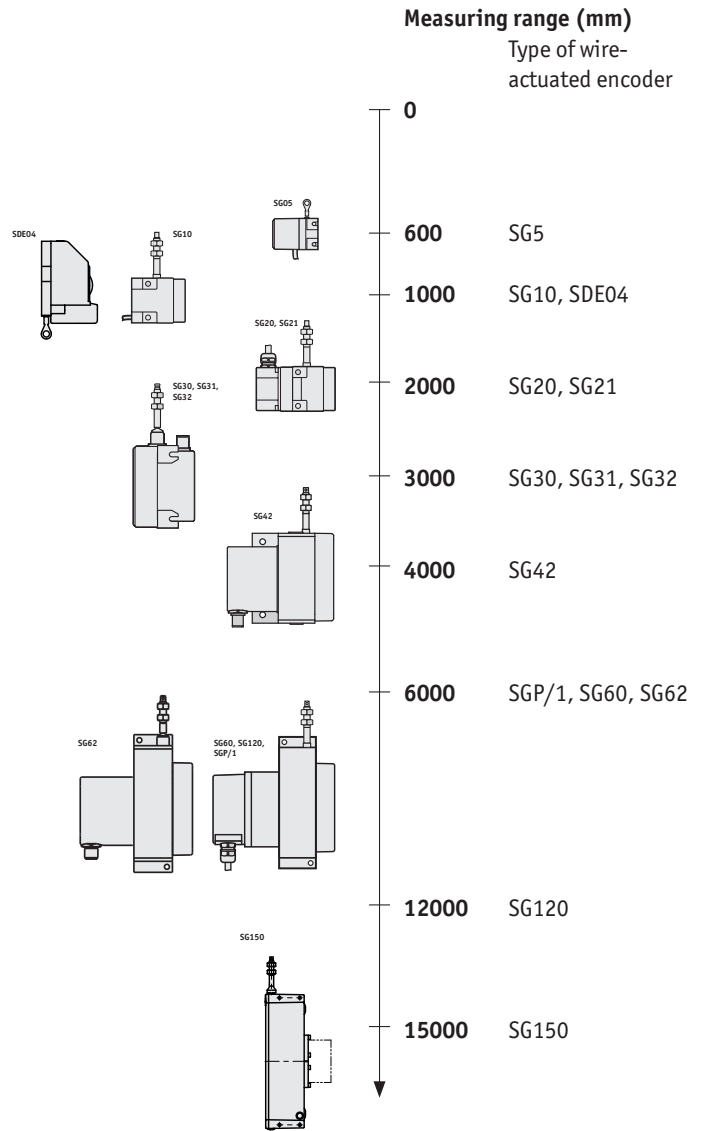
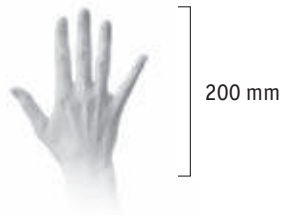
Measurement range and wire versions

Various measurement lengths and wire types are available depending on the measurement range requirements and the ambient conditions. The following table is a guide to selecting the right components (wire) when planning a linear wire measurement system..

Wire versions		Properties compared		
Type	Material	Tensile strength	Sliding properties	Measuring accuracy
S	stainless steel	•	•	•••
SK	plastic-coated steel	••	••	••
P	electric paraline non-conducting, signal color	•••	•••	•



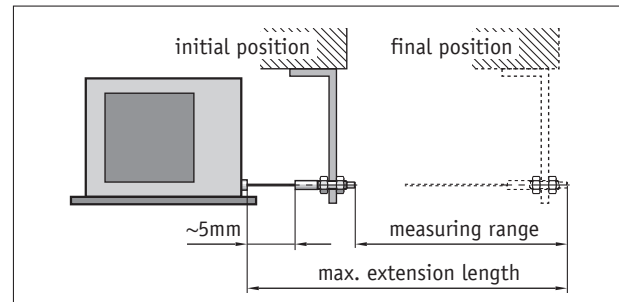
3.2



Mounting note

When attaching the wire it should be pulled out straight in line with the wire outlet.

Recommendation: A 5 mm wire extension is recommended before the measurement starting point. This prevents the wire snapping back to the stop on rewinding.



Symbolic representation

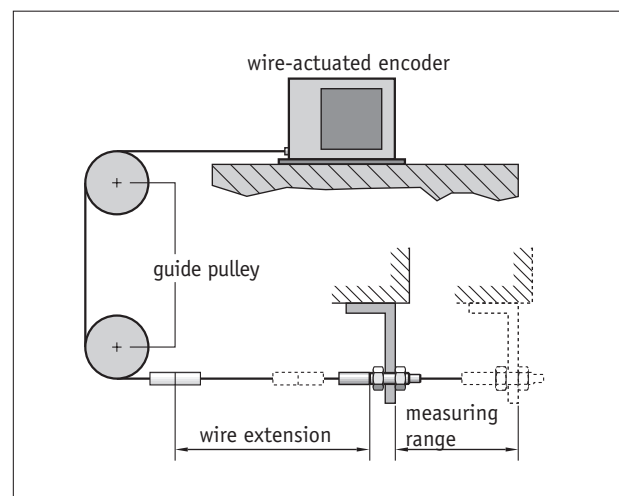
Mounting example

Guide rollers are used wherever the wire-actuated encoder cannot be installed in line with the extension direction of the wire. Several rollers can be used to redirect the wire without influencing the measurement result.

An opening slightly larger than the diameter of the wire is sufficient as a point of access at measurement sites which are hard to reach. A protective cover is recommended for use in soiled environments. Note: Mechanical stress shortens the lifespan of the wire.

A wire extension piece can be used for applications where the distance between the wire-actuated encoder and the measurement range is greater than the wire's maximum extension length. This does not extend the actual measurement range, however (see above: mounting note). This simple method is useful for measurements in areas where a sufficiently large distance is required between the wire-actuated encoder and the measured object due to high temperatures, harsh environments, measurement in liquid media, areas which are difficult to access, etc.

Detailed information on guide rollers or wire extension pieces can be found on the product page in the accessories section.

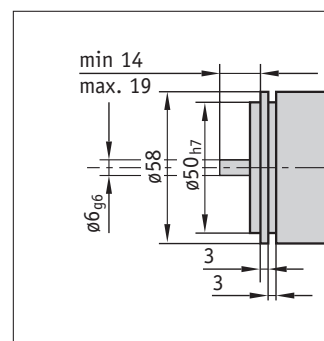


3.2

Customer-specific encoders

All rotary encoders with the following specifications can be installed on the SG31, SG60, SG120 und SG150 wire-actuators (see diagram):

- 58 mm servo/synchro flange
- 6, 8 and 10 mm solid shaft*
- Maximum starting and operating torques 3 Ncm*
*depends on device: see product pages!

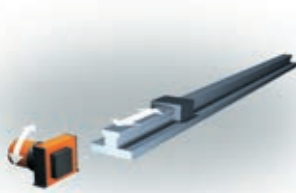


Application

Examples of use

Benefits

Rail-guided systems



Direct measurement of the guided element.



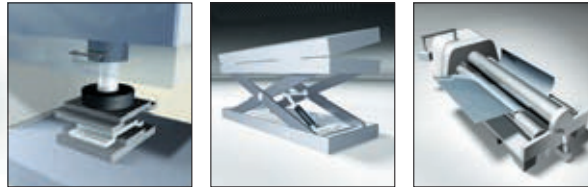
e.g., heavy duty column lifts, gantry cranes, CT patient tables ...

- Little space required
- Little assembly effort

Hydraulic cylinders



In combination with piston-guided systems or hydraulic cylinders, wire-actuated encoders use the deflection of these systems to gather length information.



e.g., presses, lifter tables, bending machines ...

- Little space required
- Mechanical tolerances do not influence measuring accuracy

Telescope-like systems



In combination with telescope-like systems, wire-actuated encoders can be ideally integrated and are also protected from environmental impact.



e.g., mobile cranes, vehicle hoists ...

- Do not require guiding
- Mechanical tolerances do not influence measuring accuracy

Chain, crane and cable winch adjustment



Direct position feedback after winch adjustment. The wire-actuated encoder can be positioned outside danger or humidity areas by means of wire extension.











e.g., forklifts, stage control systems, elevators ...

- Chain/wire tears are detectable
- Mechanical tolerances do not influence measuring accuracy



Or crane technology ...







Wire-Actuated Encoders

								
Page	14	18	22	26	29	33	36	39
Measuring length								
0 to ... [mm]	600	1000/2000*	2000	2000	3000	3000	3000	4000
Encoder type								
Power output (MWI) 4 ... 20 mA	•	•	•		•	•	•	•
Voltage output (MWU) 0 ... 10 V	•	•	•		•	•		
Potentiometer output	•	•	•		•		•	•
Incremental output		•		•		•		
SSI				•		•		
CAN-Bus				•		•		
Profibus						•		
Manufacturer of independent rotary encoder mounting				•		•		
Housing material								
Plastic	•	•						
Zinc die-cast/plastic			•	•	•	•	•	
Aluminum/plastic								•
Aluminum								

* only with incremental output

3.2

Wire-Actuated Encoders

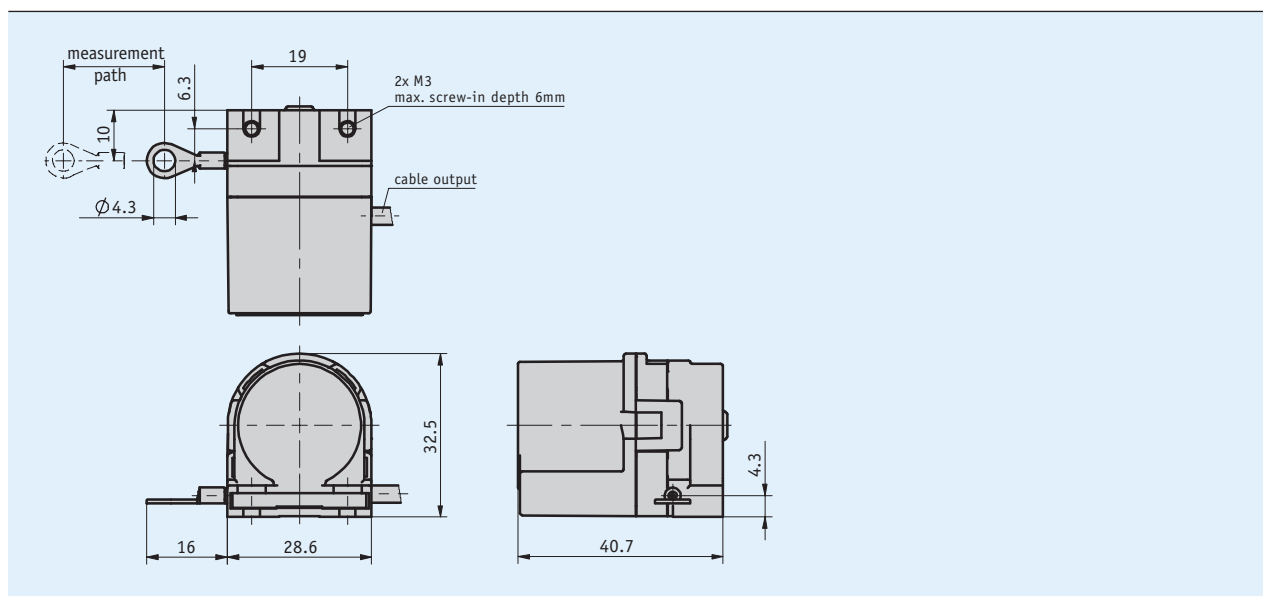
						
Page	42	46	49	52	55	57
Measuring length						
0 to ... [mm]	6000	6000	6000	12000	15000	1000
Encoder type						
Power output (MWI) 4 ... 20 mA	•	•	•	•		
Voltage output (MWU) 0 ... 10 V	•	•		•		
Potentiometer output	•		•			
Incremental output		•		•		
SSI		•		•		
CAN-Bus		•		•		
Profibus		•		•		
Manufacturer of independent rotary encoder mounting		•	•	•	•	
Housing material						
Plastic						•
Zinc die-cast/plastic						
Aluminum/plastic	•	•	•	•		
Aluminum					•	

Profile

- Very small design
- Universally applicable thanks to standardized interfaces
- Easy mounting
- Measurement lengths up to max. 600 mm
- Potentiometer, voltage or power output
- Housing made of reinforced plastic



3.2



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Wire design	steel wire (stainless steel) $\varnothing 0.36$ mm	plastic coated
Extension force	≥ 3 N	
Absolute accuracy	± 0.35 % (potentiometer)	relating to measuring length (mm)
Cable length	≤ 15 m	P10 encoder type
	≤ 30 m	MWI encoder type
	≤ 20 m	MWU encoder type
Weight	~ 0.06 kg	

Electrical data

Encoder potentiometer

Feature	Technical data	Additional information
Power rating	2 W at 70 °C	
Resistance	10 k Ω	
Resistance tolerance	± 5 %	
Linearity tolerance	± 0.25 %	

■ Transducer, power output

Feature	Technical data	Additional information
Operating voltage	24 V DC $\pm 20\%$	at $\leq 500\ \Omega$ load
Output current	4 ... 20 mA	

■ Transducer, voltage output

Feature	Technical data	Additional information
Operating voltage	15 ... 28 V DC	at 3 mA, no load
Output voltage	0 ... 10 V DC	$I_{\text{Load}} \leq 10\ \text{mA}$
Load	$\leq 10\ \text{mA}$	

*Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA (MWI) or 0 ... 10 V DC (MWU) is available.

System data

Feature	Technical data	Additional information
Repeat accuracy	$\pm 0.15\ \text{mm}$	
Travel speed	$\leq 800\ \text{mm/s}$	

3.2

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 80 °C	
Relative humidity		condensation inadmissible
Protection category	IP50 (encoder part)	EN 600529; with cable connected in the factory

Pin assignment

■ Potentiometric outputs P10

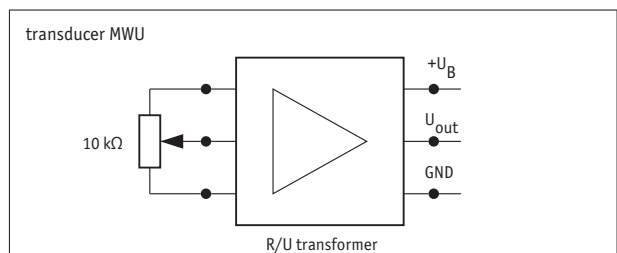
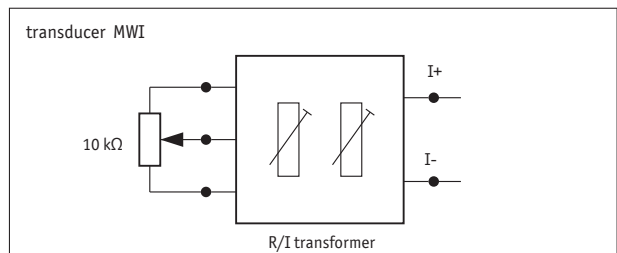
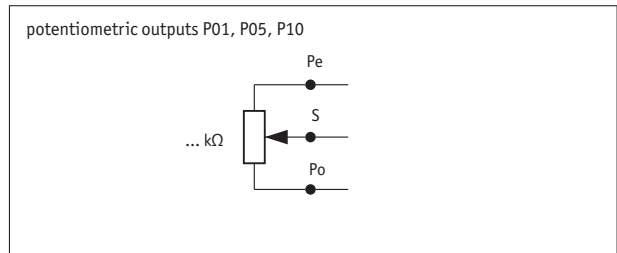
Signal	E1 (terminal)
Po	brown
Pe	white
S	green

■ MWI transducer

Signal	Cable color
I+	brown
I-	white

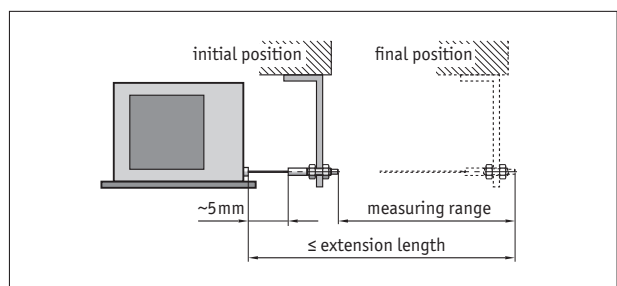
■ MWU transducer

Signal	Cable color
+24 V DC	brown
GND	white
U _{out}	green



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	300M	300 mm	Transducer setting, only with MWI or MWU encoder types
	600	600 mm	
Encoder type	P10	potentiometer with 10 kΩ	
	MWI	transducer 4 ... 20 mA	
	MWU	transducer 0 ... 10 V	
		others on request	
Cable length	OK	without cable	
	0.5	0.5 m	
	...	1 ... 15 m, in steps of 1 m	

Order key

SG5 - - -

Scope of delivery: SG5

Accessories:
Guide roller UR

page 62

Additional information:

General information and areas of application

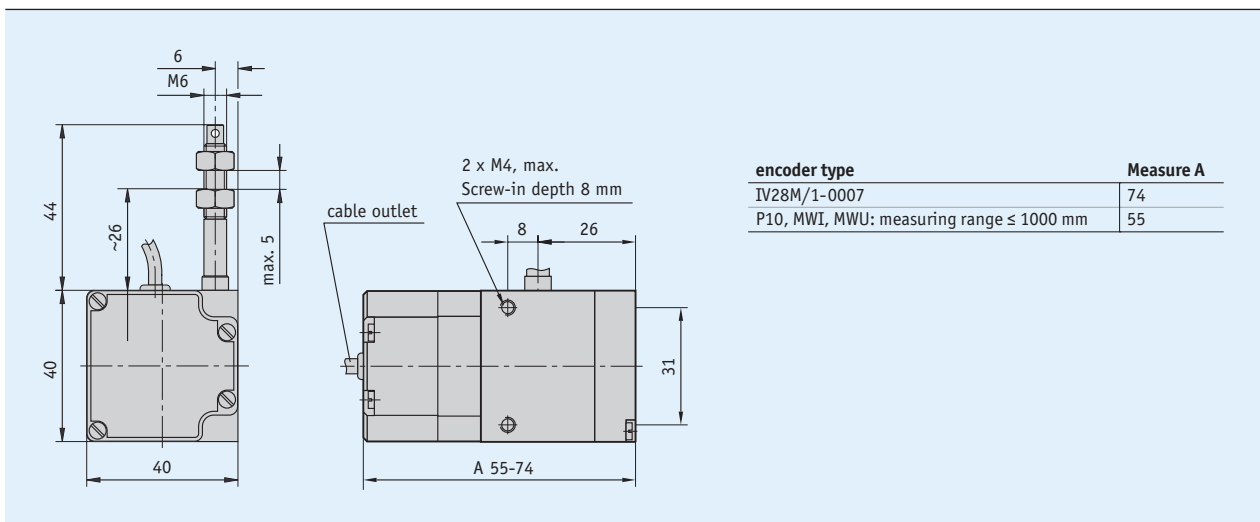
page 8

Profile

- Compact design
- Universally applicable thanks to standardized interfaces
- Easy mounting
- Measurement lengths up to max. 2000 mm
- Potentiometer, voltage, power output or incremental encoder
- Housing made of reinforced plastic



3.2



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Wire design	steel wire (stainless steel) $\varnothing 0.45$ mm	plastic coated
Extension force	≥ 2 N	
Measured distance/ rope drum revolution	100 mm	
Cable length	≤ 30 m	P10 + MWI encoder type
	≤ 20 m	MWU encoder type
	1 m	IV28M/1-0007 encoder type
Weight	~ 0.2 kg	

Electrical data

■ Encoder potentiometer

Feature	Technical data	Additional information
Power rating	1 W at 20 °C	300 measuring range
	2 W at 70 °C	500, 100 measuring ranges
Resistance	10 k Ω	
Resistance tolerance	± 5 %	
Linearity tolerance	± 0.5 %	300 measuring range
	± 0.1 %	measuring range 500
	± 0.25 %	1000 measuring range

■ Transducer, power output

Feature	Technical data	Additional information
Operating voltage	24 V DC $\pm 20\%$	at $\leq 500\ \Omega$ load
Output current	4 ... 20 mA	

■ Transducer, voltage output

Feature	Technical data	Additional information
Operating voltage	15 ... 28 V DC	at 3 mA, no load
Output voltage	0 ... 10 V DC	
Load	≤ 15 mA	

■ IV28M/1-0007 encoder incremental

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	at 25 mA, no load
Output circuit	PP	
Output signals	AB0	

* Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA (MWI) or 0 ... 10 V DC (MWU) is available.

3.2

System data

Feature	Technical data	Additional information
Resolution	0.1 mm (10 Impulse/mm)	IV28M/1-0007 encoder type
	1000 steps/revolution	IV28M/1-0007 encoder type
Repeat accuracy	± 0.15 mm	
Travel speed	≤ 800 mm/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 80 °C	without transducer
	0 ... 50 °C	with transducer
Protection category	IP50 (encoder part potentiometer)	EN 600529
	IP54 incremental	EN 600529

Pin assignment

■ Potentiometric outputs P10

Signal	E1 (terminal)
Po	brown
Pe	white
S	green

■ MWI transducer

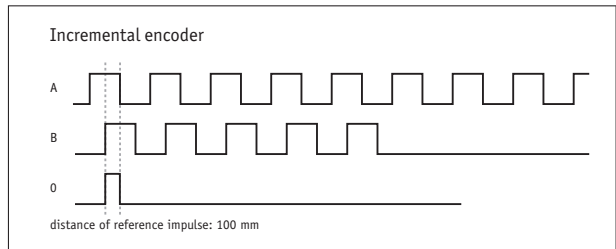
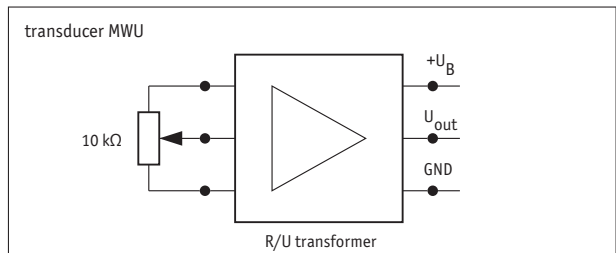
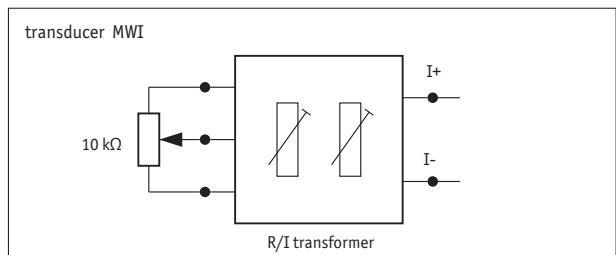
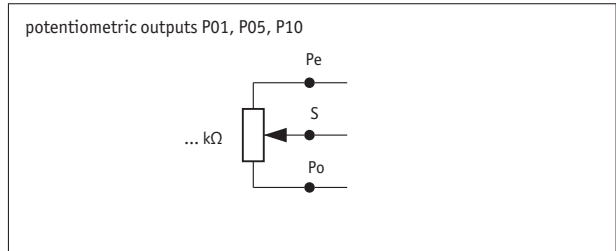
Signal	Cable color
I+	brown
I-	white

■ MWU transducer

Signal	Cable color
+24 V DC	brown
GND	white
U _{out}	green

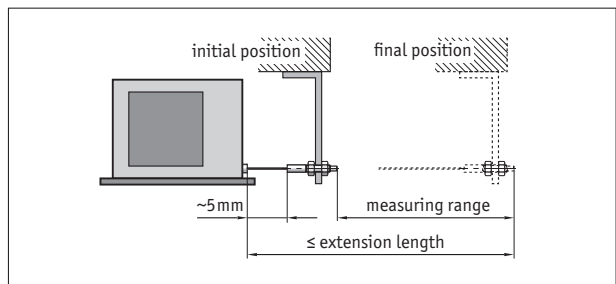
■ IV58M/1-0007 encoder type, incremental

Signal	E1 (terminal)
B	white
+24 V DC	brown
O/I	green
A	yellow
GND	gray



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet. Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	...	300, 500, 1000 in mm	Encoder types Ω , I, U (potentiometer and transducer) Incremental output IV28M/1
	2000I		
Encoder type	P10	potentiometer with 10k Ω	
	MWI	transducer 4 ... 20 mA	
	MWU	transducer 0 ... 10 V	
	IV28M/1-0007	incremental encoder others on request	only with measuring range 2000
Cable length	0.5	0.5 m	with encoder type P10 or MWI/MWU
	...	1 ... 20 m, in steps of 1 m	with encoder type P10 or MWI/MWU
	IG	specified with encoder type "IV28M/1-0007"	

Order key

SG10 - - -
A B C

Scope of delivery: SG10

Accessories:
Guide roller UR

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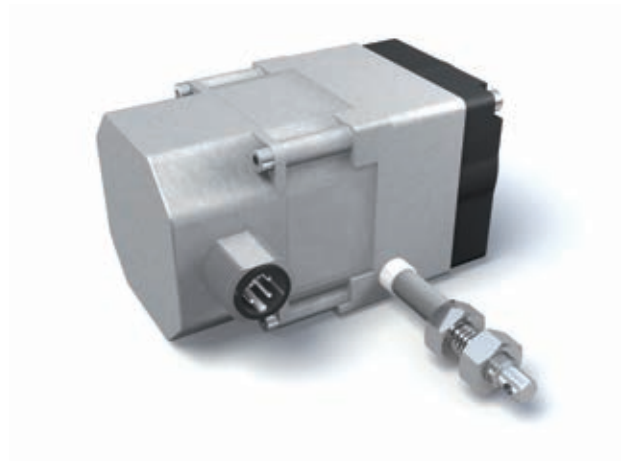
Additional information:

General information and areas of application

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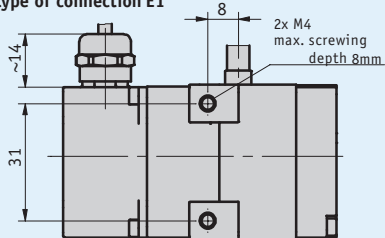
Profile

- Compact design
- Universally applicable thanks to standardized interfaces
- Easy mounting
- Measurement lengths up to max. 2000 mm
- Potentiometer, voltage or power output
- Robust zinc die-cast housing

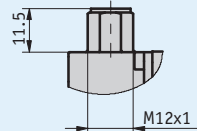


3.2

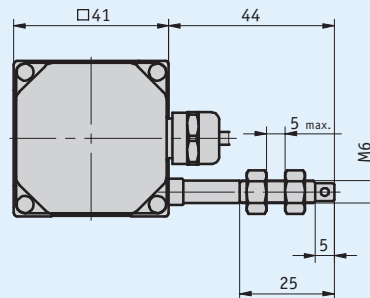
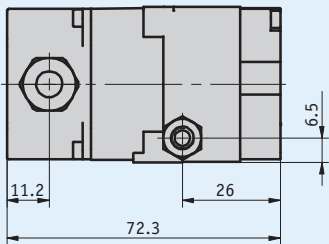
type of connection E1



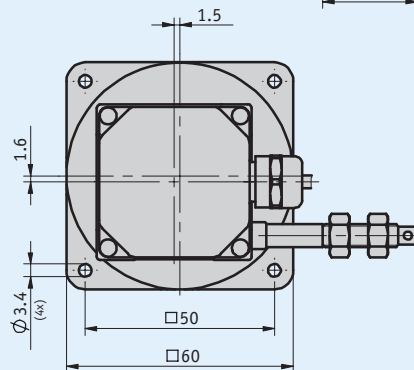
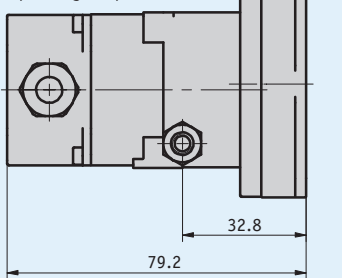
type of connection E1



operating temperature T1



operating temperature T2



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Wire design	steel wire (stainless steel) $\varnothing 0.45$ mm	plastic coated
Extension force	≥ 2 N	T1 operating temperature
	≥ 11 N	T2 working temperature
Measured distance/ rope drum revolution	100 mm	
Absolute accuracy	± 0.35 %	relating to measuring length (mm)
Cable length	≤ 30 m	4/20mA, MWIHP, MWIHP/R encoder type
	≤ 20 m	P10; 0/10V; 0,5/4,5V encoder type
Weight	~ 0.32 kg	

Electrical data

Encoder potentiometer

Feature	Technical data	Additional information
Power rating	2 W at 70 °C	
Resistance	10 k Ω	
Resistance tolerance	± 5 %	
Linearity tolerance	± 0.25 %	

Transducer, power output

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	between I+ and I-, at $\leq 500 \Omega$ load
Output current	4 ... 20 mA	(4/20mA; MWIHP)

Transducer, voltage output

Feature	Technical data	Additional information
Operating voltage	15 ... 28 V DC	at 3 mA without load (0/10V)
	8 ... 28 V DC	at 3 mA without load (0,5/4,5V)
Output voltage	0 ... 10 V DC	$I_{Load} \leq 10$ mA
	0.5 ... 4.5 V DC	$I_{Last} \leq 10$ mA (0,5/4,5V)
Resistance	2 ... 10 k Ω	against GND
Load	≤ 15 mA	

System data

Feature	Technical data	Additional information
Repeat accuracy	± 0.15 mm	
Travel speed	≤ 1 m/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 80 °C	T1
	-40 ... 80 °C	T2
Protection category	IP65 (encoder part)	EN 600529

Pin assignment

■ Potentiometric outputs P10

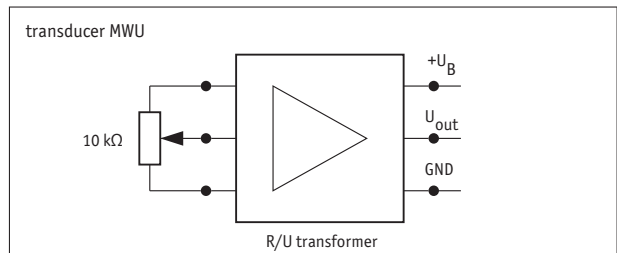
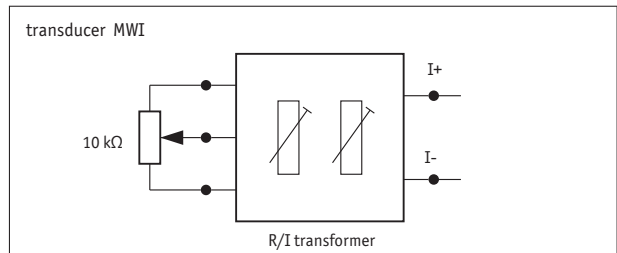
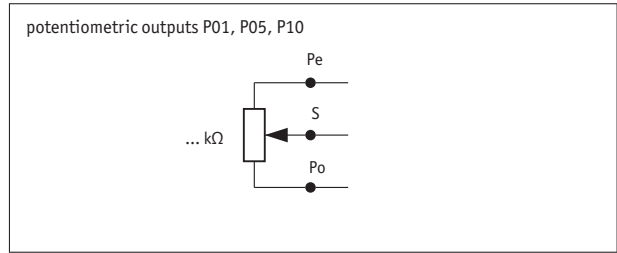
Signal	E1	E12
Po	brown	1
Pe	white	2
S	green	3
nc		4

■ MWI transducer

Signal	E1	E12
I+	brown	1
I-	white	2
nc		3
nc		4

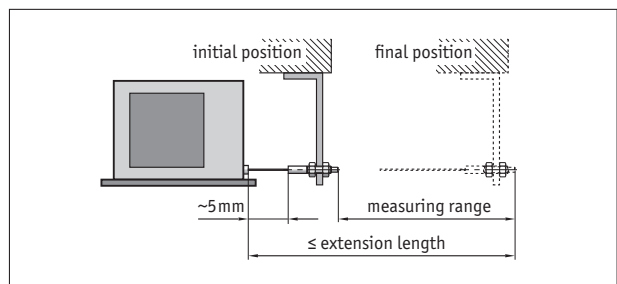
■ MWU transducer

Signal	E1	E12
+24 V DC	brown	1
GND	white	2
U _{out}	green	3
nc		4



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	1250, 1500, 1750, 2000 in mm	
Encoder type	P10	potentiometer with 10 kΩ	
	0.5/4.5V	measuring transducer 0.5 ... 4.5 V	
	0/10V	measuring transducer 0 ... 10 V	
	4/20mA	measuring transducer 4 ... 20 mA others on request	
Type of connection	E1	open cable ends	
	E12	connector	
Cable length	... D	1 ... 20.0 m, in steps of 1 m	with P10 or MWU encoder types
	...	1 ... 30.0 m, in steps of 1 m	with MWI encoder type
Operating temperature	T1	-10 ... +80 °C	
	T2	-4 ... +80 °C	

Order key

SG20 - - - - -
A B C D E

Scope of delivery: SG20, Mounting instructions

Accessories:

- Guide roller UR page 62
- Wire extension piece SV page 63
- Mating Connector Overview page 66
- Mating connector, E12, 4-pole, socket Order key 83419

Additional information:

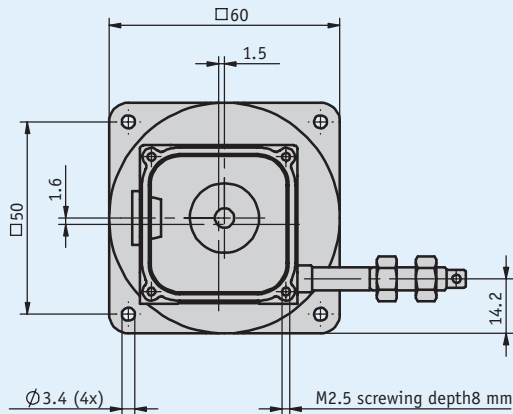
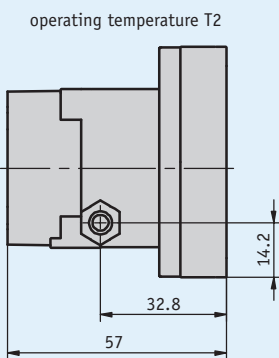
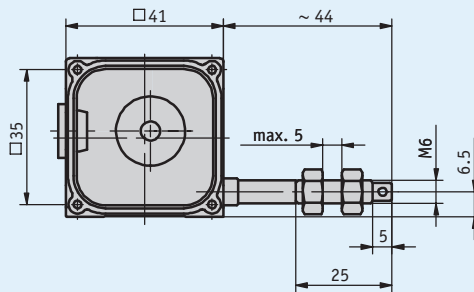
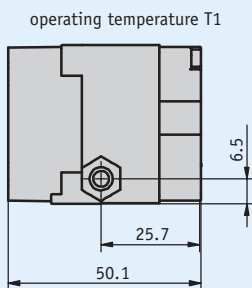
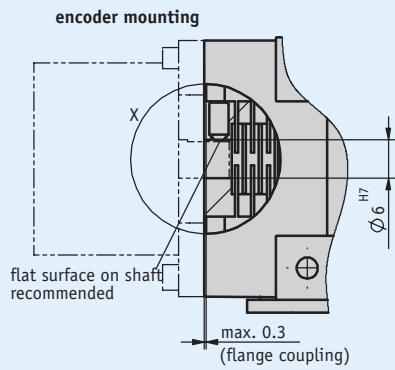
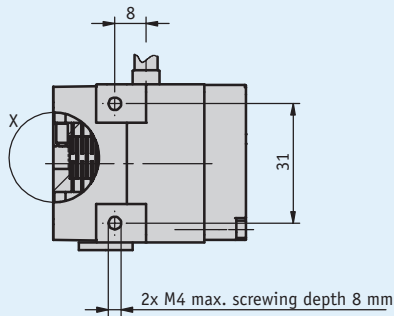
General information and areas of application page 8

Profile

- Wire-actuated encoder for rotary encoder with max. $\varnothing 40$ mm flange
- Measurement lengths up to 2000 mm
- Sturdy zinc die-cast housing, robust design, stable measuring rope (stainless steel)
- Very compact design



3.2



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Wire design	∅0.45 mm	steel wire (stainless), plastic coated
Extension force	≥2 N	T1 operating temperature
	≥11 N	T2 operating temperature
Measured distance/ rope drum revolution	100 mm	
Weight	~0.2 kg	

Electric data

Rotary encoders suitable for the SG21 are featured in RotoLine catalogue 2. Depending on the output signals the following are suitable for...

- Incremental outputs: IV28M/1
- Absolute outputs: WV36M/SSI, WV36M/CAN

The technical specifications for these devices are given in the respective data sheet. A number of transmitter versions of various manufacturers can also be used.

3.2

System data

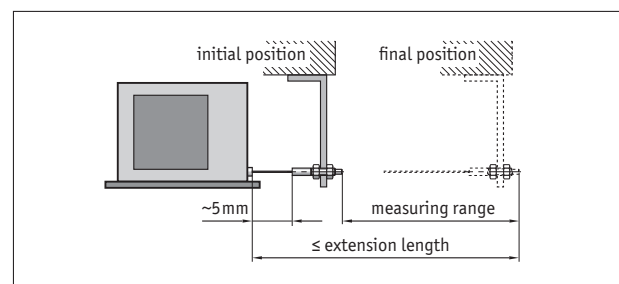
Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	per direction of approach
Travel speed	≤1 m/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 80 °C	T1
	-40 ... 80 °C	T2

Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering information

one or more system components are required:

Mounting Flange ZB4002

page 64

Ordering table

Feature	Ordering data	Specification	Additional information
Encoder type	OG6	without encoder	
	S6	a wide range of encoders can be used	see accessories
Operating temperature	T1	-10 ... +80 °C	
	T2	-40 ... +80 °C	

Order key

SG21 - -

3.2

Scope of delivery: SG21, Mounting instructions

Accessories:

Guide roller UR

page 62

Wire extension piece SV

page 63

Incremental encoder IV28M/1

www.siko-global.com

Absolute encoder WV36M/SSI

www.siko-global.com

Absolute encoder WV36M/CAN

www.siko-global.com

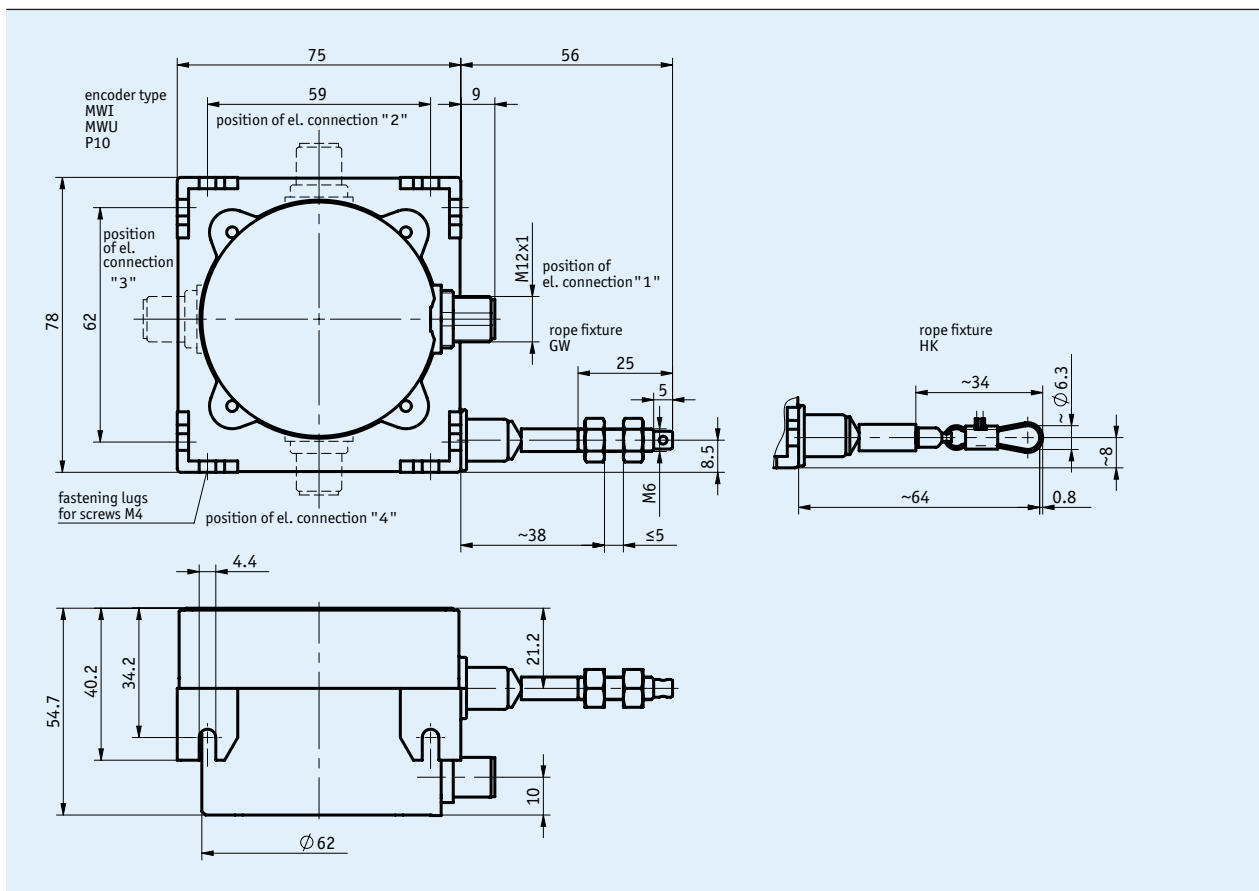
Additional information:

General information and areas of application

page 8

Profile

- Compact, robust design
- Variable mounting options
- Measuring lengths up to 3000 mm
- Potentiometer, voltage or power output
- Housing made of zinc die-cast and plastic
- Lockable ventilation holes against condensation
- High tightness at the rope outlet
- M12 connection



3.2

Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast, plastic	
Wire design	steel wire (stainless steel) $\varnothing 0.87$ mm	plastic coated
Extension force	≥ 3 N	
Cable length	≤ 30 m	P10, MWI encoder types
	≤ 20 m	MWU encoder type
Weight	~ 0.5 kg	

Electrical data

Encoder potentiometer

Feature	Technical data	Additional information
Power rating	2 W at 70 °C	
Resistance	10 kΩ	
Resistance tolerance	±5 %	
Linearity tolerance	±0.25 %	
Type of connection	M12 plug connector (A-coded)	4-pole, 1x pin

Transducer, power output

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	between I+ and I-, at ≤500 Ω load
Output current	4 ... 20 mA	
Type of connection	M12 plug connector (A-coded)	4-pole, 1x pin

Transducer, voltage output

Feature	Technical data	Additional information
Operating voltage	15 ... 28 V DC	at 3 mA without load
Output voltage	0 ... 10 V DC	I _{load} ≤10 mA
Resistance	2 ... 10 kΩ	against GND
Load	≤15 mA	
Type of connection	M12 plug connector (A-coded)	4-pole, 1x pin

* Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA (MWI) or 0 ... 10 V DC (MWU) is available.

System data

Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	per direction of approach
Measuring range	≤3000 mm	
Travel speed	≤800 mm/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 80 °C	
Relative humidity		condensation inadmissible
Protection category	IP65 (encoder part)	EN 600529

Pin assignment

■ Potentiometric outputs P10

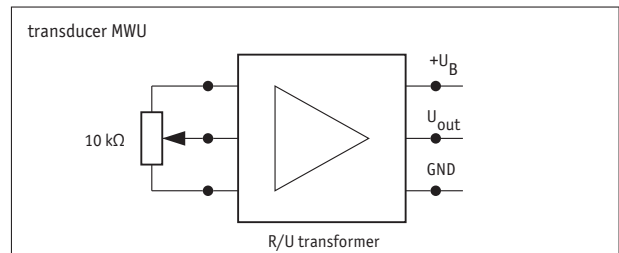
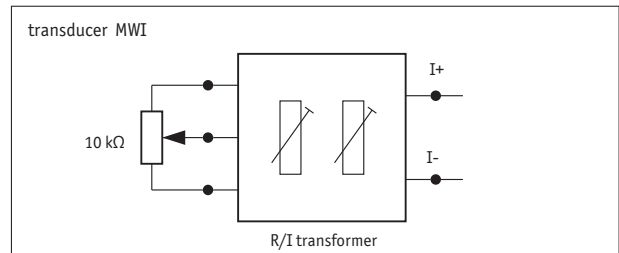
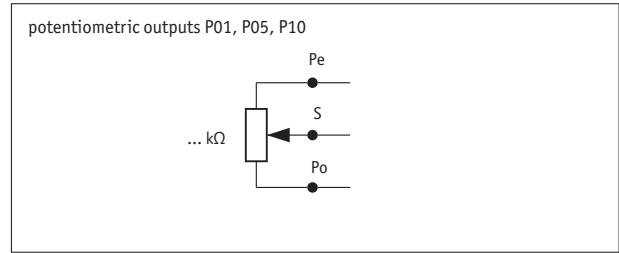
Signal	PIN
Po	1
Pe	2
S	3
	4

■ MWI transducer

Signal	PIN
I+	1
I-	2
nc	3
nc	4

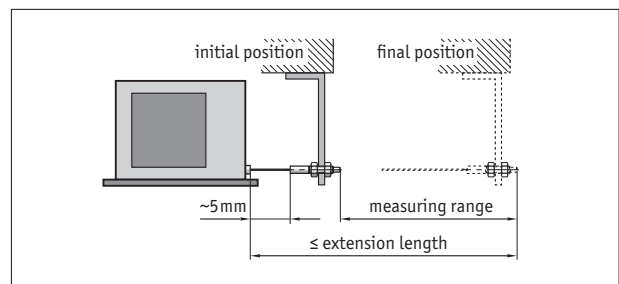
■ MWU transducer

Signal	PIN
+24 V DC	1
GND	2
U _{out}	3
nc	4



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



Symbolic representation

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	2000, 2500, 3000 in mm	
Rope fixture	GW	wire suspension with thread	
	HK	wire suspension hook	
Encoder type	MWI	transducer, current	
	MWU	transducer, voltage	
	P10	potentiometer	
Position of electrical connection	1	0 °	
	2	90 °	
	3	180 °	
	4	270 °	

Order key



Scope of delivery: SG30

Accessories:

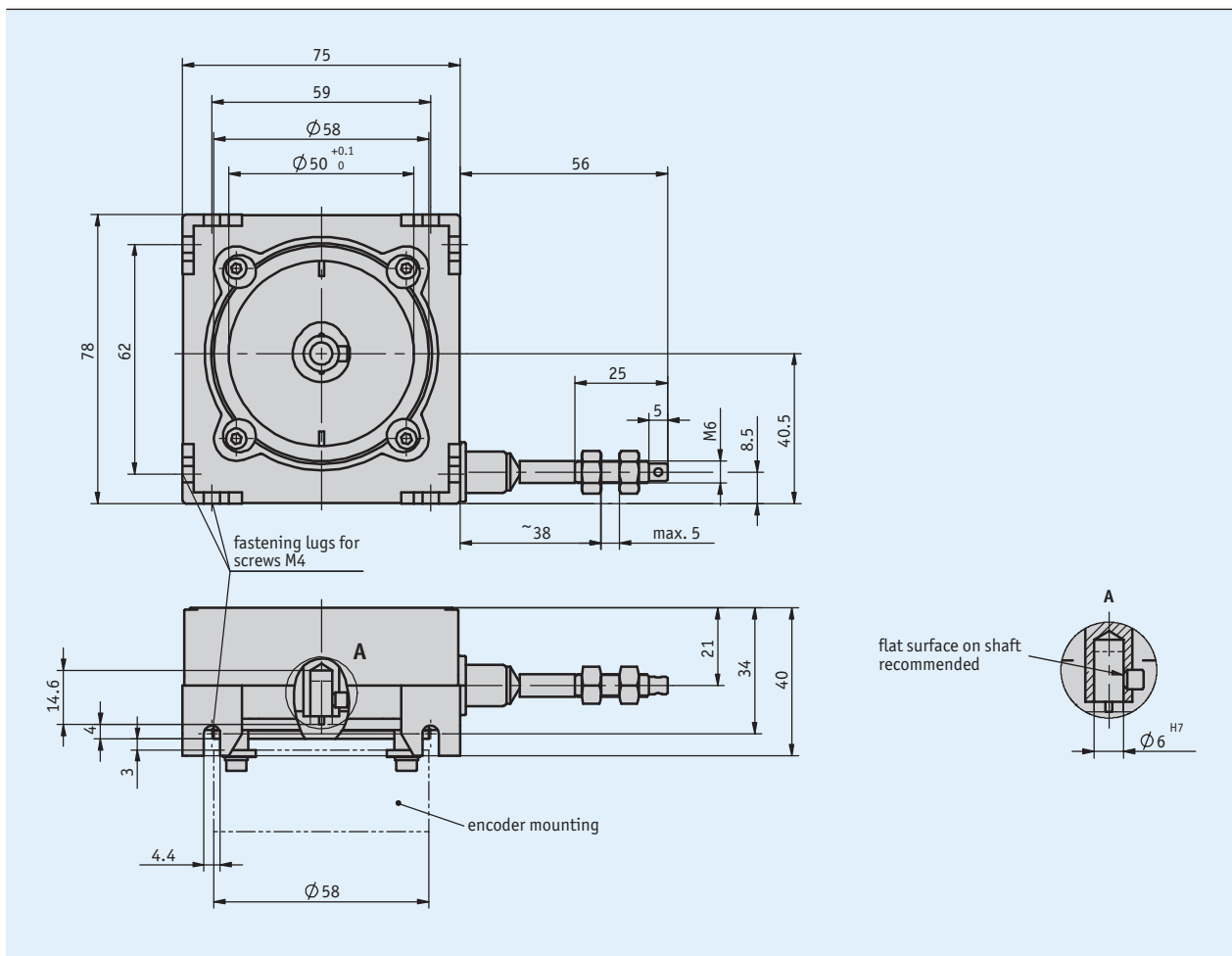
- Guide roller UR page 62
- Wire extension piece SV page 63
- Mating Connector Overview page 66
- Mating connector, P10, MWI, MWU, 4-pole, socket Order key 83419
- Mating connector, P10, MWI, MWU, 4-pole, socket Order key 83526

Additional information:

- General information and areas of application page 8

Profile

- Robust design
- Measuring lengths up to 3000 mm
- Wire-actuated encoder for rotary encoder with 58 mm servo-flange
- Variable mounting options
- Lockable ventilation holes against condensation
- Very robust measuring rope (stainless steel)
- High tightness at the rope outlet



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast, plastic	
Wire design	$\varnothing 0.87$ mm	steel wire (stainless), plastic coated
Extension force	≥ 3 N	
Measured distance/ rope drum revolution	200 mm	
Weight	~ 0.35 kg	

Electric data

Rotary encoders suitable for the SG31 are featured in RotoLine catalogue 2. Depending on the output signals the following are suitable for...

- Analog outputs such as current or voltage: AV58M
- Incremental outputs: IV58M
- Absolute outputs: WV36M/SSI, WV36M/CAN

The technical specifications for these devices are given in the respective data sheet. A number of transmitter versions of various manufacturers can also be used.

System data

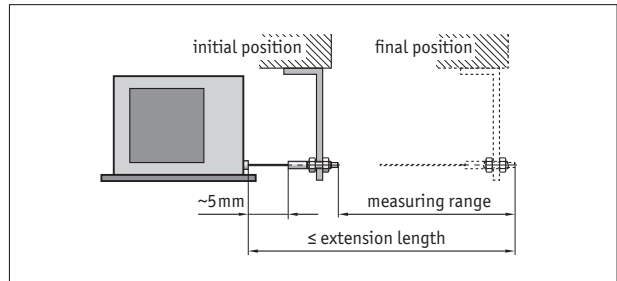
Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	per direction of approach
Travel speed	≤800 mm/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 80 °C	

Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet. Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering information

one or more system components are required:

Absolute encoder AV58M

www.siko-global.com

Incremental encoder IV58M

www.siko-global.com

Absolute encoder WV36M/SSI

www.siko-global.com

Absolute encoder WV36M/CAN

www.siko-global.com

Ordering table

Feature	Ordering data	Specification	Additional information
Encoder type	OG6	without encoder	see accessories
	S6	a wide range of encoders can be used	

Order key

SG31 -

Scope of delivery: SG31, Mounting instructions

Accessories:

Guide roller UR

page 62

Wire extension piece SV

page 63

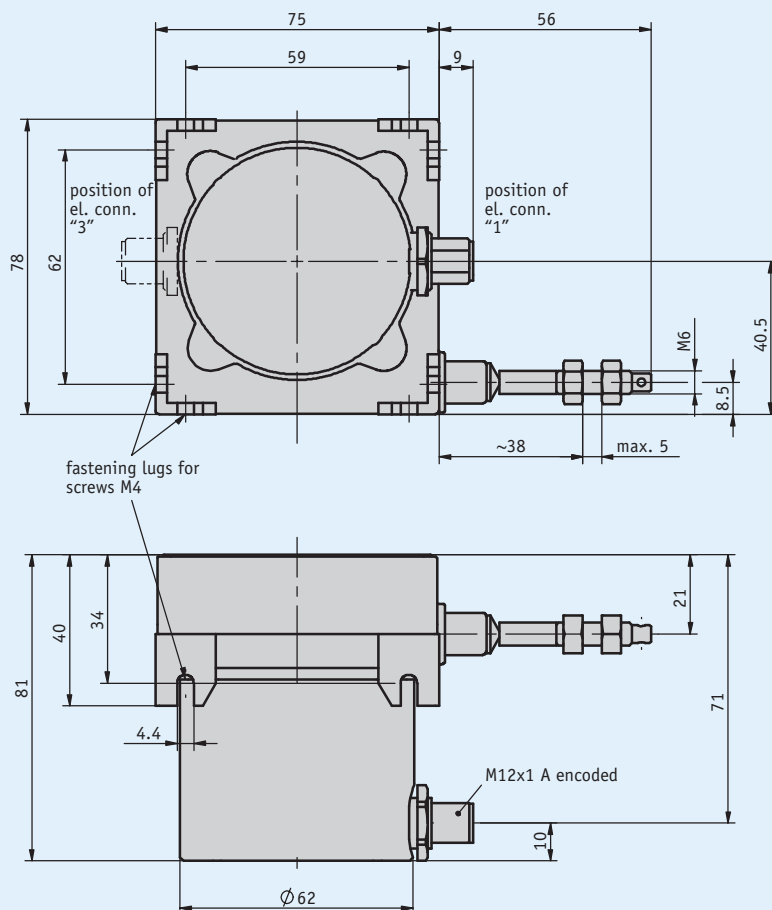
Additional information:

General information and areas of application

page 8

Profile

- Robust design
- Measuring lengths up to 3000 mm
- Analogue signal output in redundant design (2x 4...20 mA or potentiometer)
- Variable mounting options
- Lockable vent and water drain holes
- Very robust measuring rope (stainless steel)
- IP65 protection category
- M12 plug connection



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast, plastic	
Wire design	ø0.87 mm	steel wire (stainless), plastic coated
Extension force	≥3 N	
Absolute accuracy	±0.35 %	relating to measuring ranges (mm)
Weight	~0.5 kg	

Electrical data

Encoder potentiometer

Feature	Technical data	Additional information
Operating voltage	≤30 V	power loss on the potentiometer <1 W
Power rating	1 W at 70 °C	
Resistance	10 kΩ	
Resistance tolerance	±5 %	
Standard terminal resistance	0.5 % or 1 Ω	(the higher value applies in each case)
Linearity tolerance	±0.25 %	
Type of connection	M12 plug connector (A-coded)	8-pole, 1x pin

Transducer, power output

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	with load impedance ≤500 Ω voltage between I+ and I-
Output current	4 ... 20 mA	(2x)
Failure rate	166.7 year(s)	at 60°C (MTBF)
Type of connection	M12 plug connector (A-coded)	8-pole, 1x pin

* Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA or 20 ... 4 mA is available.

3.2

System data

Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	same direction of approach
Travel speed	≤800 mm/s	

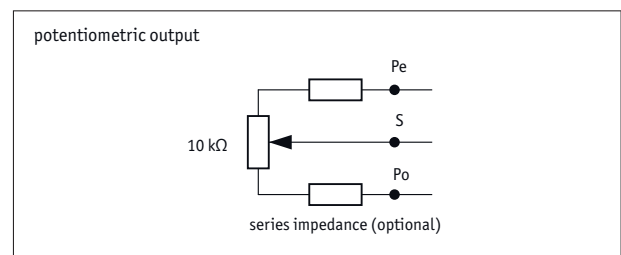
Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 80 °C	
Protection category	IP65 (for electronic unit)	EN 60529, Certonal-coated electronic unit

Pin assignment

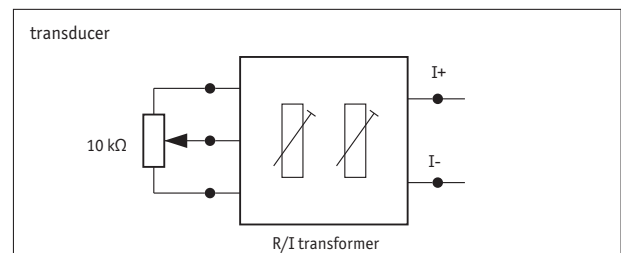
Potentiometer pin assignment

Signal	PIN	Additional information
Po	1	Potentiometer 1
Po	2	Potentiometer 2
S	3	Potentiometer 2
Pe	4	Potentiometer 2
nc	5	
Pe	6	Potentiometer 1
S	7	Potentiometer 1
nc	8	



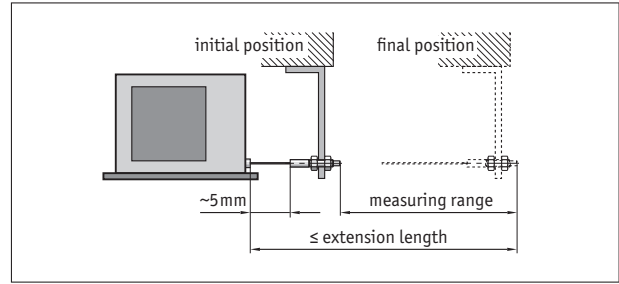
Transducer pin assignment

Signal	Pin	Additional information
I+	1	Transducer 1
I+	2	Transducer 2
nc	3	
I-	4	Transducer 2
nc	5	
I-	6	Transducer 1
nc	7	
nc	8	



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

■ **Ordering table**

Feature	Ordering data	Specification	Additional information
Measuring range	... A	2000, 2500, 3000 in mm	
Encoder type	P10_P10 B	2x potentiometer 10 kΩ	
	20/4mA_20/4mA	2x transducers 20...4 mA	
	4/20mA_20/4mA	2x transducers 4...20 mA counter-rotating	
	4/20mA_4/20mA	2x transducers 4...20 mA	
Position of electrical connection	1 C	0 °	
	3	180 °	
Series impedance	0	0 Ω	only for P10_10 encoder type
	1k2 D	1.2 kΩ	only for P10_10 encoder type

■ **Order key**



Scope of delivery: SG32, Mounting instructions

Accessories:

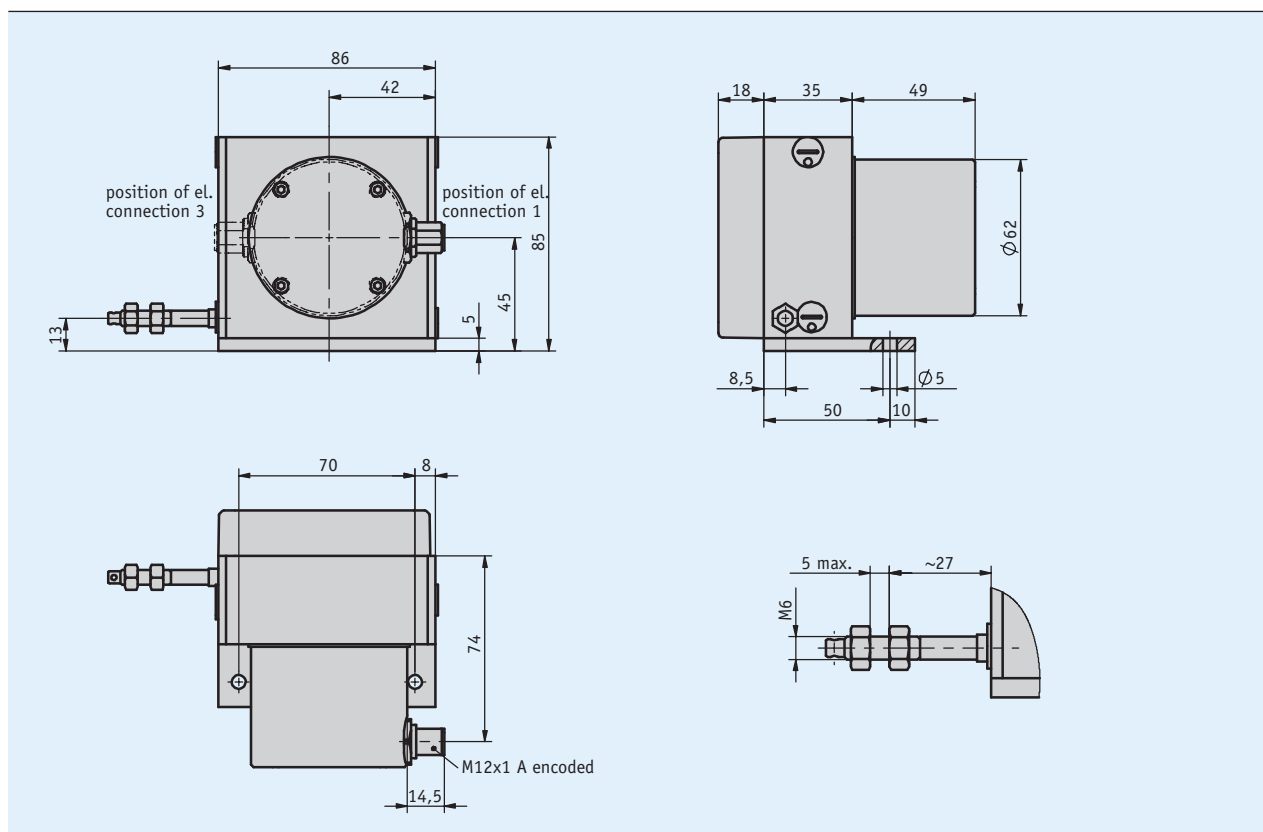
- Guide roller UR page 62
- Wire extension piece SV page 63
- Mating Connector Overview page 66
- Mating connector, 8-pole, socket Order key 83525

Additional information:

General information and areas of application page 8

Profile

- Robust design
- Measuring lengths up to 4000 mm
- Analogue signal output in redundant design (2x 4...20 mA or potentiometer)
- Variable mounting options
- Lockable vent and water drain holes
- Very robust measuring rope (stainless steel)
- IP65 protection category
- M12 plug connection



3.2

Mechanical data

Feature	Technical data	Additional information
Housing	aluminum/plastic	
Wire design	ø0.87 mm	steel rope (stainless), plastic-coated
Extension force	≥8 N	
Absolute accuracy	±0.35 %	relating to measuring length (mm)
Weight	~0.79 kg	

Electrical data

■ **Encoder potentiometer**

Feature	Technical data	Additional information
Operating voltage	≤30 V	power loss on the potentiometer <1 W
Power rating	1 W at 70 °C	
Resistance	10 kΩ	
Resistance tolerance	±5 %	
Standard terminal resistance	0.5 % or 1 Ω	the higher value applies in each case
Linearity tolerance	±0.25 %	
Type of connection	M12 plug connector (A-coded)	8-pole, 1x pin

■ **Transducer, power output**

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	with load impedance ≤500 Ω voltage between I+ and I-
Output current	4 ... 20 mA	(2x)
Failure rate	166.7 year(s)	at 60°C (MTBF)
Type of connection	M12 plug connector (A-coded)	8-pole, 1x pin

* Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA or 20 ...4 MA is available.

System data

Feature	Technical data	Additional information
Repeat accuracy	±0.25 mm	same direction of approach
Travel speed	≤800 mm/s	

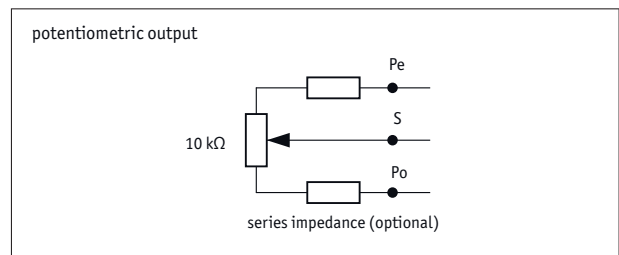
Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 80 °C	
Protection category	IP65 (for electronic unit)	EN 60529, Certonal-coated electronic unit

Pin assignment

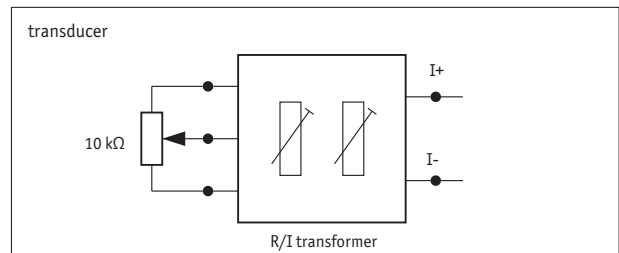
■ **Potentiometer pin assignment**

Signal	PIN	Additional information
Po	1	Potentiometer 1
Po	2	Potentiometer 2
S	3	Potentiometer 2
Pe	4	Potentiometer 2
nc	5	
Pe	6	Potentiometer 1
S	7	Potentiometer 1
nc	8	



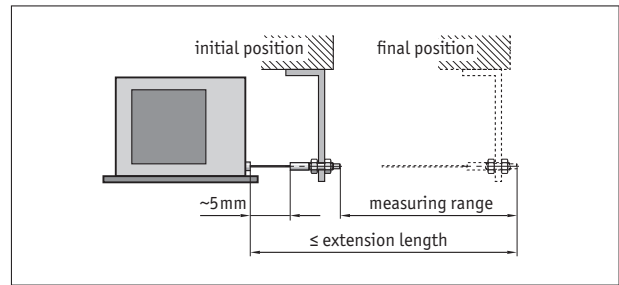
■ **Transducer pin assignment**

Signal	Pin	Additional information
I+	1	Transducer 1
I+	2	Transducer 2
nc	3	
I-	4	Transducer 2
nc	5	
I-	6	Transducer 1
nc	7	
nc	8	



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



Symbolic representation

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	3300, 3700, 4000 in mm	
Encoder type	P10_P10 B	2x potentiometers 10 kΩ	
	20/4mA_20/4mA	2x transducers 20...4 mA	
	4/20mA_20/4mA	2x transducers 4...20 mA counter-rotating	
	4/20mA_4/20mA	2x transducers 4...20 mA	
Position of electrical connection	1 C	0 °	
	3	180 °	
Series impedance	0 D	0 Ω	only for P10_10 encoder type
	1k2	1.2 kΩ	only for P10_10 encoder type

Order key



Scope of delivery: SG42, Mounting instructions

Accessories:

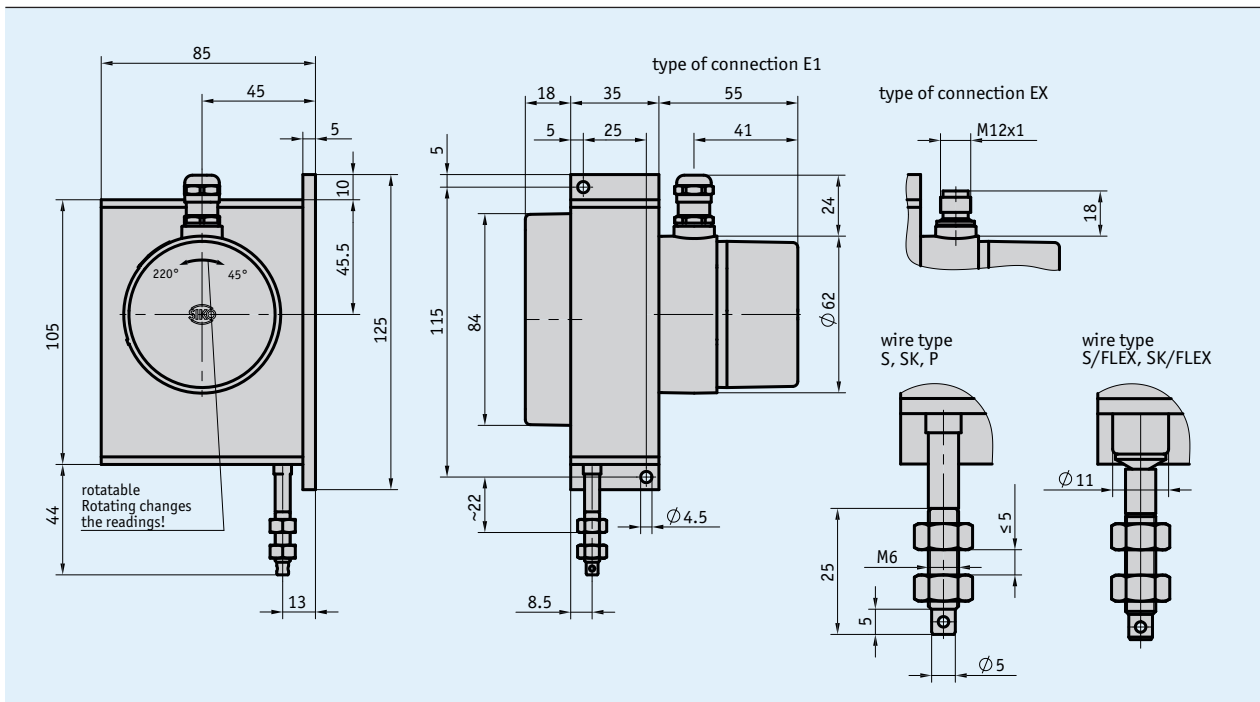
- Guide roller UR page 62
- Wire extension piece SV page 63
- Mating Connector Overview page 66
- Mating connector, 8-pole, socket Order key 83525

Additional information:

- General information and areas of application page 8

Profile

- Robust design
- Measurement lengths up to max. 6000 mm
- Potentiometer, voltage or power output
- Housing made of aluminum and plastic
- Potentiometer/resistance range adapted to actual measurement length via an integrated gear
- Various wire types



Mechanical data

Feature	Technical data	Additional information
Housing	aluminum/plastic	
Wire design	steel wire $\phi 0.54$ mm steel wire (stainless steel) $\phi 0.87$ mm para-line synthetic rope $\phi 1.05$ mm	plastic coated
Extension force	≥ 8 N	
Measured distance/ rope drum revolution	200 mm	
Weight	~ 0.7 kg	

max. travel speed

Measuring range [mm]	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	6000
Travel speed [mm/s]	≤ 200	≤ 300	≤ 300	≤ 400	≤ 490	≤ 500	≤ 600	≤ 700	≤ 800	≤ 800	≤ 900	≤ 1000	≤ 1000

Electrical data

Encoder potentiometer

Feature	Technical data	Additional information
Power rating	2 W at 70 °C	
Resistance	1 kΩ	P01
	2 kΩ	P02
	5 kΩ	P05
	10 kΩ	P10
Resistance tolerance	±5 %	
Linearity tolerance	±0.25 %	

Transducer, power output

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	between I+ and I-, load ≤500 Ω
Output current	4 ... 20 mA	

Transducer, voltage output

Feature	Technical data	Additional information
Operating voltage	15 ... 28 V DC	at 3 mA without load
Output voltage	0 ... 10 V DC	
Resistance	2 ... 10 kΩ	against GND
Load	≤15 mA	

* Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA (MWI) or 0 ... 10 V DC (MWU) is available.

System data

Feature	Technical data	Additional information
Repeat accuracy	~0.5 mm	per direction of approach
Travel speed	see table	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-20 ... 80 °C	T1
	-40 ... 80 °C	T2 (draw-in speed ≤800 mm/s)
Protection category	IP65 (potentiometer part)	EN 600529

Pin assignment

■ Potentiometric outputs P10

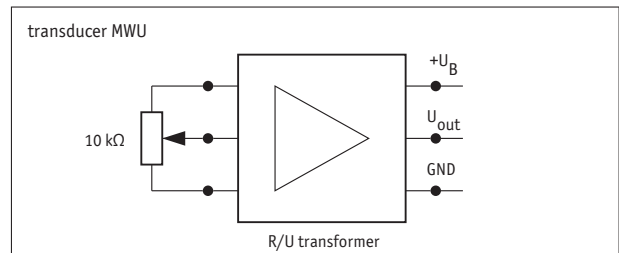
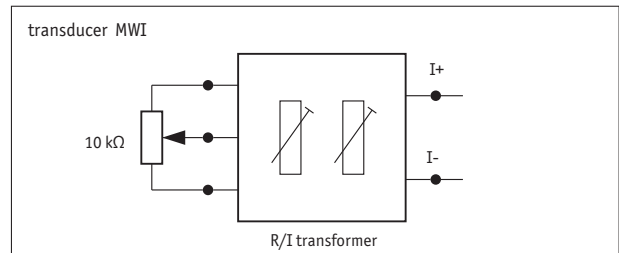
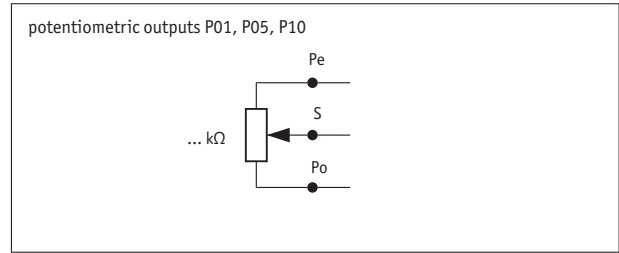
Signal	E1 (terminal)	E12 (connector pin)
Po	brown	1
Pe	white	2
S	green	3
nc		4

■ MWI transducer

Signal	E1 (terminal)	E12 (connector pin)
I+	1	1
I-	2	2
nc	3	3
nc		4

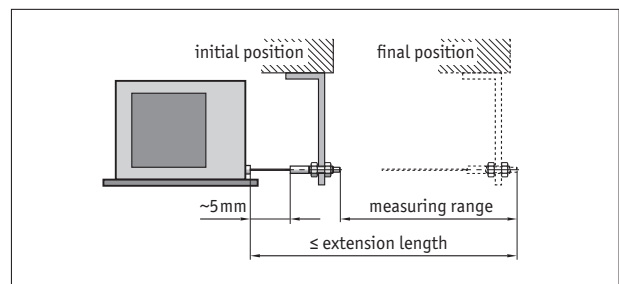
■ MWU transducer

Signal	E1 (terminal)	E12 (connector pin)
+24 V DC	1	1
GND	2	2
U _{out}	3	3
nc		4



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet. Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	750 ... 6000 mm, in steps of 250 mm	
Wire design	S	stainless steel rope	measuring range ≤ 6000 mm
	SK	stainless steel rope, plastic-coated	measuring range ≤ 4000 mm
	P	para-line, non-conducting, signal color	measuring range ≤ 2800 mm
	S/FLEX	stainless steel rope, flexible rope outlet	measuring range ≤ 6000 mm
	SK/FLEX	stainless steel rope, plastic-coated, flexible rope outlet	measuring range ≤ 4000 mm
Type of connection	E1	cable gland PG7	cable ø 3-6.5 mm
	EX	for M12 connector	
Potentiometer type	02	10 helices/wire	(P01, P05, P10)
	03	10 helices/hybrid	(P01, P05, P10)
Analog output	MWI	4 ... 20 mA transducer	
	MWU	0 ... 10 V transducer	
	P01	potentiometer 1 kΩ	
	P05	potentiometer 5 kΩ	
Operating temperature	T1	-20 ... +80 °C	≤ feed speed 800 mm/s
	T2	-40 ... +80 °C	

3.2

Order key

SGP/1 - - - - - -

A B C D E F

Scope of delivery: SGP/1, Mounting instructions

Accessories:

- Guide roller UR page 62
- Wire extension piece SV page 63
- Mating Connector Overview page 66
- Mating connector, EX, 4-pole, socket Order key 83419

Additional information:

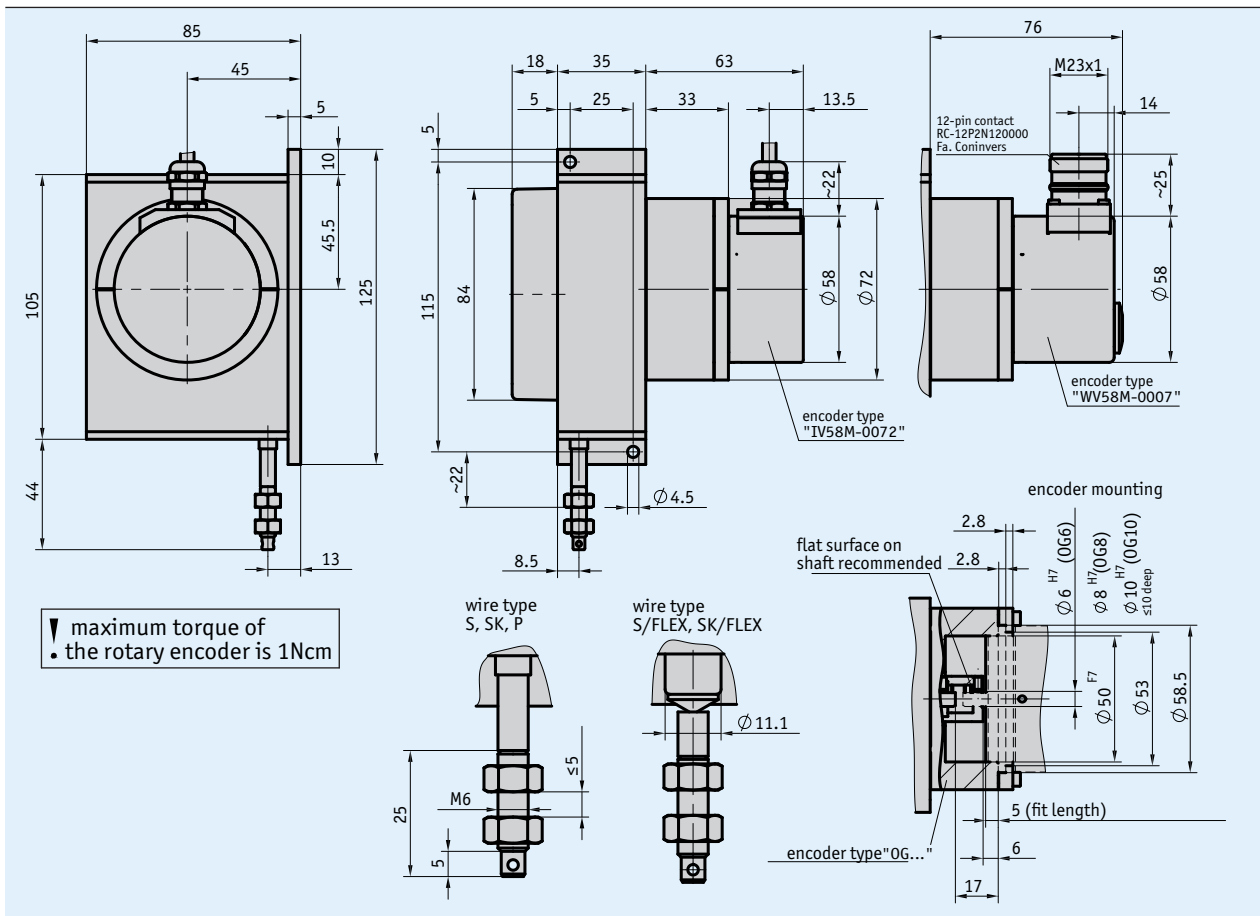
General information and areas of application page 8

Wire-actuated encoder SG60

robust design with 6000 mm measurement length

Profile

- Robust design
- Easy mounting
- Measurement lengths up to max. 6000 mm
- Incremental or absolute encoder
- Housing made of aluminum and plastic
- High flexibility thanks to free choice of rotary encoders with 58 mm standard flange
- Various wire types



Mechanical data

Feature	Technical data	Additional information
Housing	aluminum/plastic	
Wire design	<ul style="list-style-type: none"> Ø0.54 mm Ø0.87 mm Ø1.05 mm 	<ul style="list-style-type: none"> steel wire steel wire, plastic coated para-line plastic rope
Extension force	≥8 N	on the wire
Measured distance/ rope drum revolution	200 mm	
Weight	~0.6 kg	

Electric data

Rotary encoders suitable for the SG60 are featured in RotoLine catalogue 2. Depending on the output signals the following are suitable for:

- Analog outputs such as current or voltage: AV58M
- Incremental outputs: IV58M
- Absolute outputs: WV36M/SSI, WV36M/CAN

The technical specifications for these devices are given in the respective data sheets. A great number of transmitter versions of various manufacturers can also be used.

System data

Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	depending on the direction of approach (1st layer)
Measuring range	≤6000 mm	
Travel speed	≤3000 mm/s	

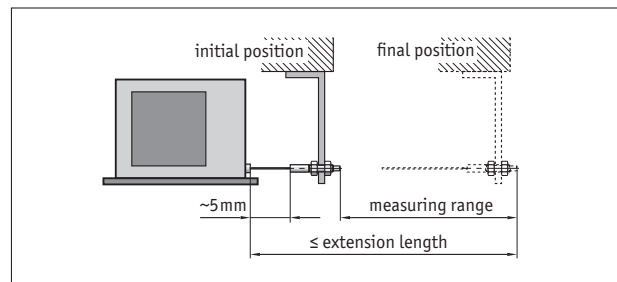
3.2

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-20 ... 80 °C	T1
	-40 ... 80 °C	T2 (drawing-in speed ≤800 mm/s)
Protection category	IP54 (standard encoder)	EN 60529

Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet. Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



symbolic depiction

Order

Ordering information

one or more system components are required:

Incremental encoder IV58M
 Absolute encoder WV36M/SSI
 Absolute encoder WV36M/CAN

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 www.siko-global.com
 www.siko-global.com

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	1000 ... 6000 mm, in steps of 100 mm	
Wire design	S	stainless steel rope	measuring range ≤ 6000 mm
	SK	stainless steel rope, plastic-coated	measuring range ≤ 4000 mm
	P	para-line, non-conducting, signal color	measuring range ≤ 2800 mm
	S/FLEX	stainless steel rope, flexible rope outlet	measuring range ≤ 6000 mm
	SK/FLEX	stainless steel rope, plastic-coated, flexible rope outlet	measuring range ≤ 4000 mm
Encoder type	OG6	without encoder, 6 mm diameter of coupling	see accessories
	OG8	without encoder, with 8 mm diameter of coupling	see accessories
	OG10	without encoder, 10 mm diameter of coupling	see accessories
Operating temperature	T1	-20 ... +80 °C	
	T2	-40 ... +80 °C	≤ feed speed 800 mm/s
Color	N	natural, anodized	
	E	others on request	

Order key



Scope of delivery: SG60

Accessories:

Guide roller UR

page 62

Wire extension piece SV

page 63

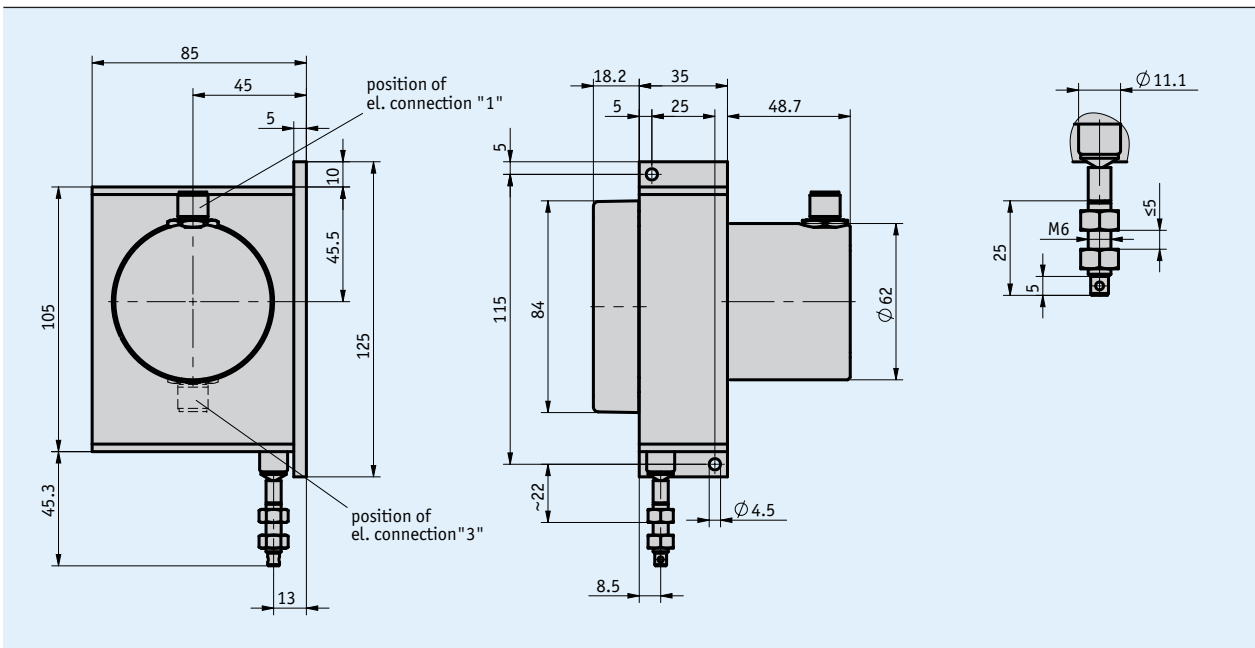
Additional information:

General information and areas of application

page 8

Profile

- Robust design
- Measuring lengths up to 6000 mm
- Analogue signal output in redundant design (2x 4...20 mA or potentiometer)
- Very robust measuring rope (stainless steel)
- IP65 protection category
- M12 plug connection



3.2

Mechanical data

Feature	Technical data	Additional information
Housing	aluminum/plastics	
Wire design	ø0.87 mm	steel rope (stainless) plastic-coated
Extension force	≥8 N on the rope	
Weight	~0.8 kg	

Electrical data

■ Encoder potentiometer

Feature	Technical data	Additional information
Power rating	1 W at 70 °C	
Resistance tolerance	±5 %	
Standard terminal resistance	0.5 % or 1 Ω	each the greater value applies
Linearity tolerance	±0.25 %	
Type of connection	M12 plug connector (A-coded)	8-pole, 1x pin

■ Transducer, power output

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	with load impedance $\leq 500 \Omega$ voltage between I+ and I-
Output current	4 ... 20 mA	(2x)
Failure rate	166.7 year(s)	at 60°C (MTBF)
Type of connection	M12 plug connector (A-coded)	8-pole, 1x pin

* Measurement transducers permit optimum adjustment of the output current and output voltage to the measuring range. The measurement transducer is pre-set at the works so that an output signal of 4 ... 20 mA or 20 ... 4 mA is available.

System data

Feature	Technical data	Additional information
Repeat accuracy	± 0.25 mm	per starting direction
Travel speed	≤ 800 mm/s	

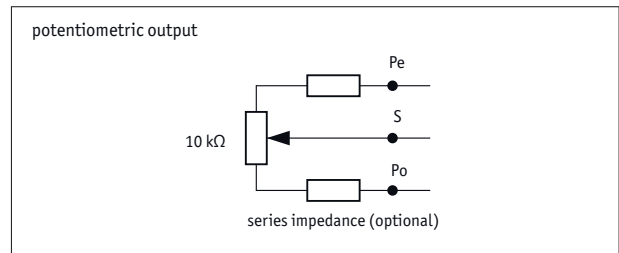
Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 80 °C	
Relative humidity	condensation inadmissible	
Protection category	IP65 (for electronic unit)	EN 60529, certonal-coated electronic unit

Pin assignment

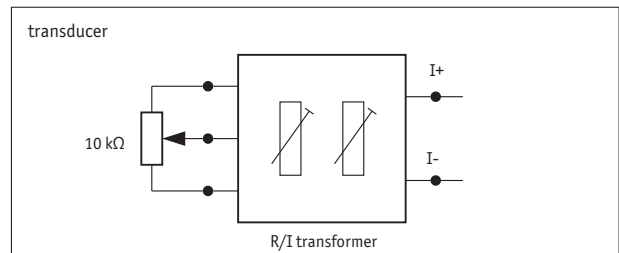
■ Potentiometer pin assignment

Signal	PIN	Additional information
Po	1	Potentiometer 1
Po	2	Potentiometer 2
S	3	Potentiometer 2
Pe	4	Potentiometer 2
nc	5	
Pe	6	Potentiometer 1
S	7	Potentiometer 1
nc	8	



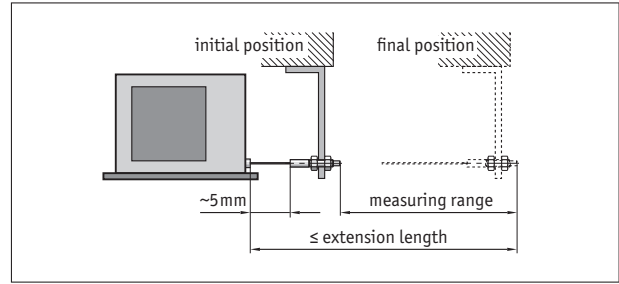
■ Transducer pin assignment

Signal	Pin	Additional information
I+	1	Transducer 1
I+	2	Transducer 2
nc	3	
I-	4	Transducer 2
nc	5	
I-	6	Transducer 1
nc	7	
nc	8	



Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



Symbolic representation

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	5000, 6000 in mm	
Encoder type	P10 P10 B	2x potentiometer 10 kΩ	
	20/4mA_20/4mA	2x transducer 4...20 mA	
	4/20mA_20/4mA	2x transducer 4...20 mA, counter-rotating	
	4/20mA_4/20mA	2x transducer 4...20 mA	
Position of electrical connection	1 C	0 °	
	3	180 °	
Series impedance	0 D	0 Ω	
	1k2	1.2 kΩ	

Order key



Scope of delivery: SG62, Mounting instructions

Accessories:

Guide roller UR

page 62

Wire extension piece SV

page 63

Additional information:

General information and areas of application

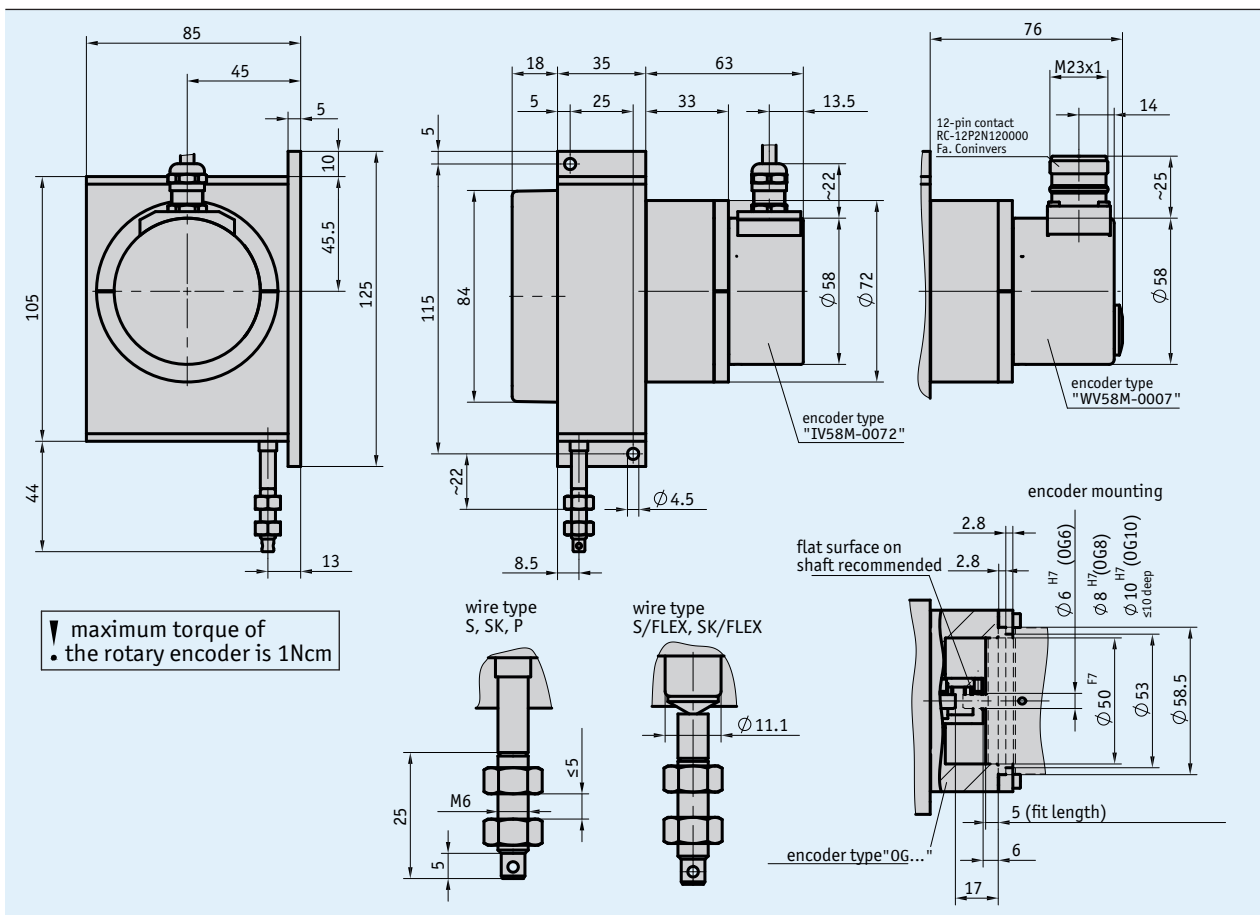
page 8

Wire-actuated encoder SG120

robust design with 12 m measurement length

Profile

- Robust design
- Easy mounting
- Measurement lengths up to max. 12000 mm
- Incremental or absolute encoder
- Housing made of aluminum and plastic
- High flexibility thanks to free choice of rotary encoders with 58 mm standard flange
- Various wire types



Mechanical data

Feature	Technical data	Additional information
Housing	aluminum/plastic	
Wire design	<ul style="list-style-type: none"> Ø0.54 mm Ø0.87 mm Ø1.05 mm 	<ul style="list-style-type: none"> steel wire steel wire, plastic coated para-line plastic rope
Extension force	≥8 N	on the wire
Measured distance/ rope drum revolution	200 mm	
Weight	~0.7 kg	

System data

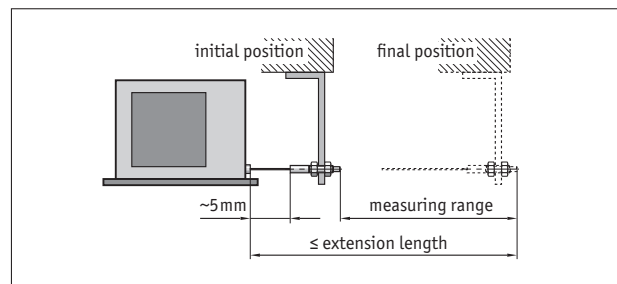
Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	depending on the direction of approach (1st layer)
Measuring range	≤12000 mm	
Travel speed	≤3000 mm/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-20 ... 80 °C	
Protection category	IP54 (standard encoder)	EN 60529

Hint for mounting

When securing the wire it must be ensured that the wire is straight and vertical in relation to the wire outlet.
 Recommendation: Only select the starting position after an unwound length of approx. 5 mm. This prevents the wire hitting the end stop when it is rewound.



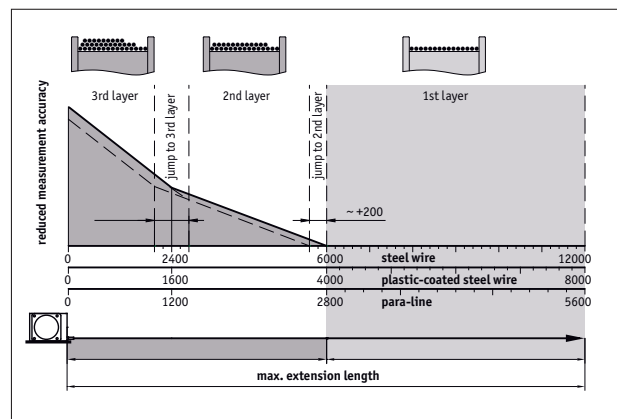
symbolic depiction

3.2

Extension length/measuring range

SIKO wire-actuated encoders achieve the maximum measuring accuracy when the entire wire length (measuring range) is only wound onto the drum in one layer. On the SG120 the wire diameter is selected so that when the first drum layer is used, a maximum measuring range of 6000 mm is possible. The larger diameter of the plastic sheathed steel wire and the Paraline require more space. The result is a correspondingly shorter measuring range. If a lower measuring accuracy is acceptable, two to three layer winding is also possible, and the possible measuring lengths change accordingly.

Extension lengths SG120	1st layer	2nd and 3rd layers
Steel wire	6000 mm	12000 mm
Steel wire, plastic-coated	4000 mm	8000 mm
Paraline	2800 mm	5600 mm



dimensions refer to millimeters

Order

Ordering information

one or more system components are required:

Absolute encoder AV58M	www.siko-global.com
Incremental encoder IV58M	www.siko-global.com
Absolute encoder WV36M/SSI	www.siko-global.com
Absolute encoder WV36M/CAN	www.siko-global.com

Ordering table

Feature	Ordering data	Specification	Additional information
Measuring range	... A	2900 ... 12000 mm, in steps of 100 mm	
Wire design	S	stainless steel rope	measuring range ≤ 6100 ... 12000 mm
	SK	stainless steel rope, plastic-coated	measuring range ≤ 4100 ... 8000 mm
	P	para-line, non-conducting, signal color	measuring range ≤ 2900 ... 5600 mm
	S/FLEX	stainless steel rope, flexible rope outlet	
	SK/FLEX	stainless steel rope, plastic-coated, flexible rope outlet	
Encoder type	OG6	without encoder, with 6 mm diameter of coupling	see accessories
	OG8	without encoder, with 8 mm diameter of coupling	see accessories
	OG10	without encoder, with 10 mm diameter of coupling	see accessories
Color	N	natural, anodized	
	D	others on request	

Order key



Scope of delivery: SG120

Accessories:

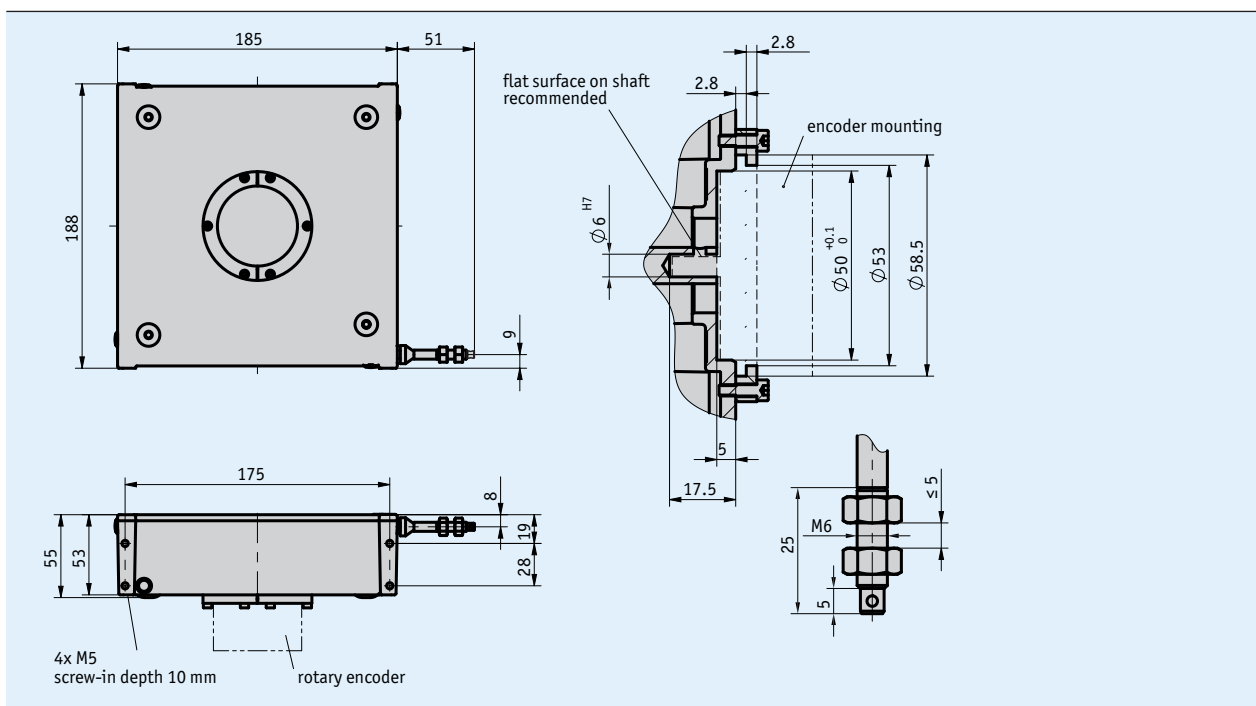
Guide roller UR page 62
 Wire extension piece SV page 63

Additional information:

General information and areas of application page 8

Profile

- Very compact design
- Measurement lengths up to max. 15000 mm
- Flexible wire outlet
- Wire-actuated encoder for rotary encoder with 58 mm servo-flange
- Robust design
- Very robust measuring rope (stainless steel)



3.2

Mechanical data

Feature	Technical data	Additional information
Housing	aluminum die-cast	
Wire design	$\phi 0.87$ mm	steel wire, plastic-coated
Extension force	≥ 15.5 N	
Measured distance/ rope drum revolution	500 mm	
Weight	~ 2.5 kg	without rotary encoder

System data

Feature	Technical data	Additional information
System accuracy	± 0.1 %	relating to measuring length (mm)
Repeat accuracy	± 0.2 mm	per direction of approach
Travel speed	≤ 2.4 m/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 80 °C	
Protection category	see rotary encoder	

Order

Ordering information

one or more system components are required:

Incremental encoder IV58M

www.siko-global.com

Absolute encoder WV36M/SSI

www.siko-global.com

Absolute encoder WV36M/CAN

www.siko-global.com

Absolute encoder AV58M

www.siko-global.com

Ordering table

Feature	Ordering data	Specification	Additional information
Encoder type	0G6	without encoder	
	S6	a great variety of rotary connectors can be connected	

Order key

SG150 - 15000 - SK -

Scope of delivery: SG150, User information

Accessories:

Guide roller UR

page 62

Wire extension piece SV

page 63

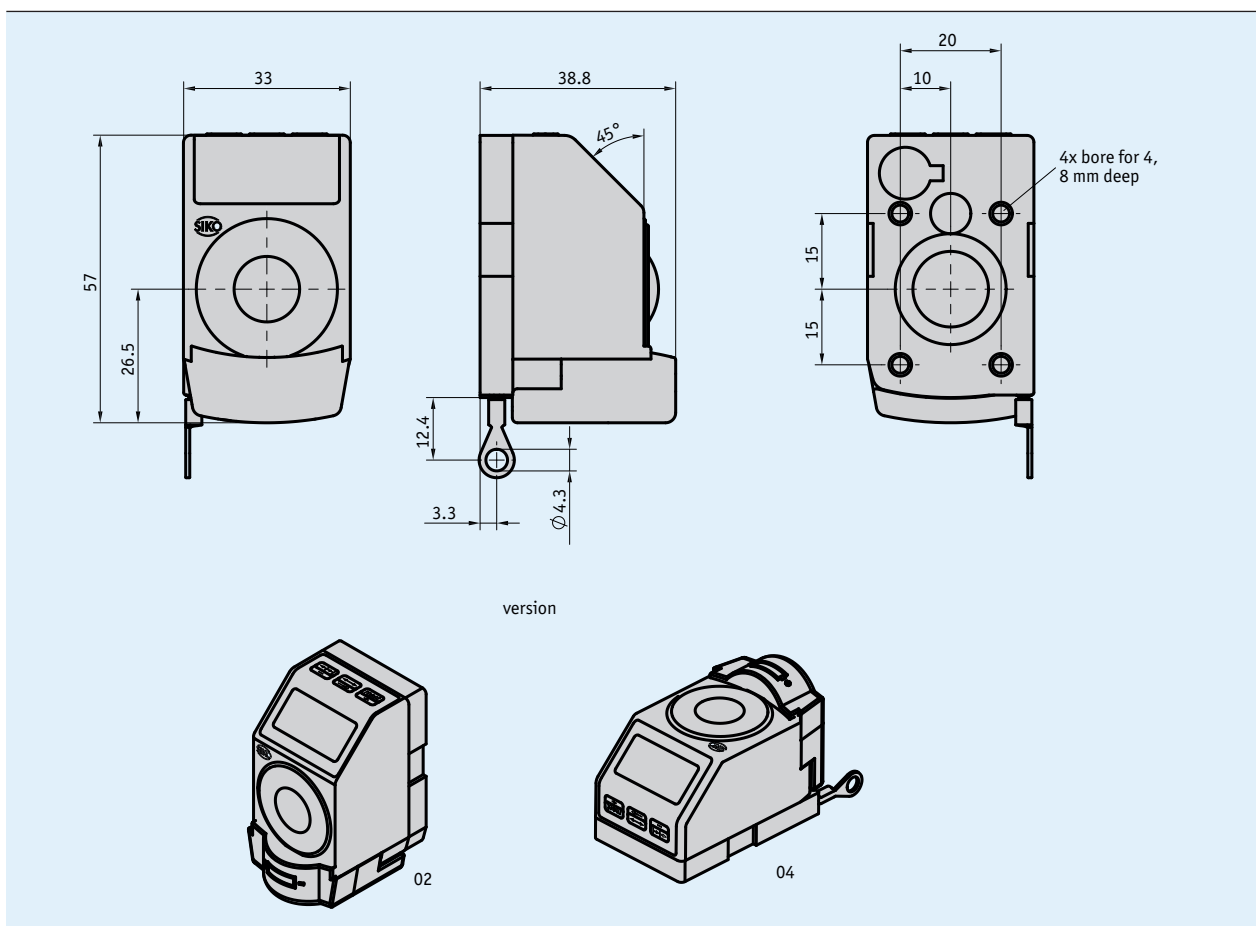
Additional information:

General information and areas of application

page 8

Profile

- Wire-actuated encoder with a freely programmable electronic digital display
- Linear distance measurement up to 1000 mm
- Long battery life
- Easy battery change without dismantling of the device
- LCD display with 5 digits and special characters
- Digit height approx. 8 mm
- Flexible mounting position
- Easy mounting



3.2

Mechanical data

Feature	Technical data	Additional information
Housing	plastic	
Wire design	steel wire (stainless steel) $\varnothing 0.36$ mm	plastic coated
Extension force	≥ 3 N	
Weight	~ 0.06	

Electrical data

Feature	Technical data	Additional information
Battery	lithium coin cell, 3 V, CR2477 type	~8 years service life
Display/display range	5-digit LCD 7-segment, ~8 mm height	-19999 ... 99999

System data

Feature	Technical data	Additional information
Repeat accuracy	±0.15 mm	
Travel speed	≤800 mm/s	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 60 °C	
Storage temperature	-30 ... 80 °C	
EMC	EN 61000-6-2 EN 61000-6-4	interference resistance / immission electromagnetic emission
Protection category	IP50	EN 60529

3.2

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Version	02	downward wire extension	
	04	horizontal wire extension	
Measuring range	1000	1000 mm, resolution 1 mm	
	1000.0	1000 mm, resolution 0.1 mm	
	40.0	40 inch, resolution 0.1 inch	
	40.00	40 inch, resolution 0.01 inch	
Counting direction	e	ascending with wire extension	
	i	descending with wire extension	
Key pad operation	D	direct zeroing	
	V	zeroing delayed by 5 s	

Order key

SDE04 - - - - - -

Scope of delivery: SDE04, User information

Additional information:
General information and areas of application

page 8

3.2

3.3



3.1 | Overview 3

3.2 | Wire-actuated Encoder 7

3.3 | Accessories

Products	UR	62
	SV	63
	ZB4002	64
	Mating Connector Overview	66

3.4 | Appendix 69

3.5 | Product index, contact information 73

3.1

3.2

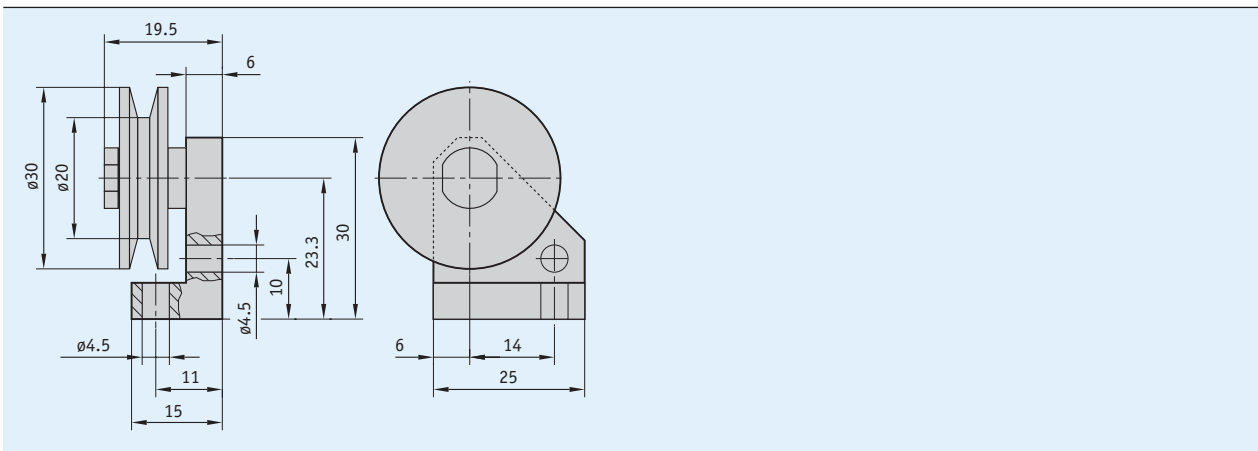
3.3

3.4

3.5

Profile

- For changing the measurement direction. Guide rollers are used when the wire-actuated encoder cannot be installed inline with the extension direction of the wire
- Several guide rollers can be combined



Mechanical data

Feature	Technical data	Additional information
Material	plastic aluminum	roller accommodation
Weight	0.025 kg	

Order

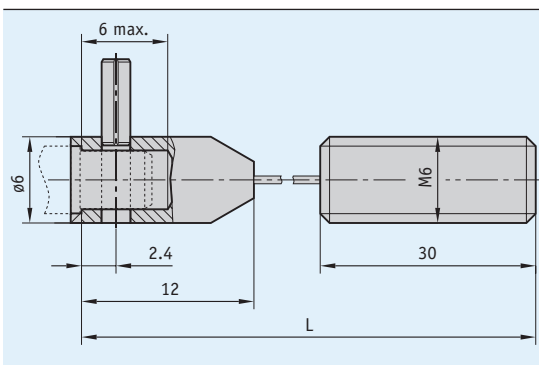
- **Mounting example**
(See page 11)
- **Order key**

UR

Scope of delivery: UR

Profile

- For extending the measurement wire or bridging the gap to the object to be measured. This does not extend the actual measurement range of the encoder, however
- Easy mounting



3.3

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Wire length	...	A 0.1 ... 20 m, in steps of 0.1 m	
Wire design	SK P	B steel rope, plastic-coated Para-line	

Order key



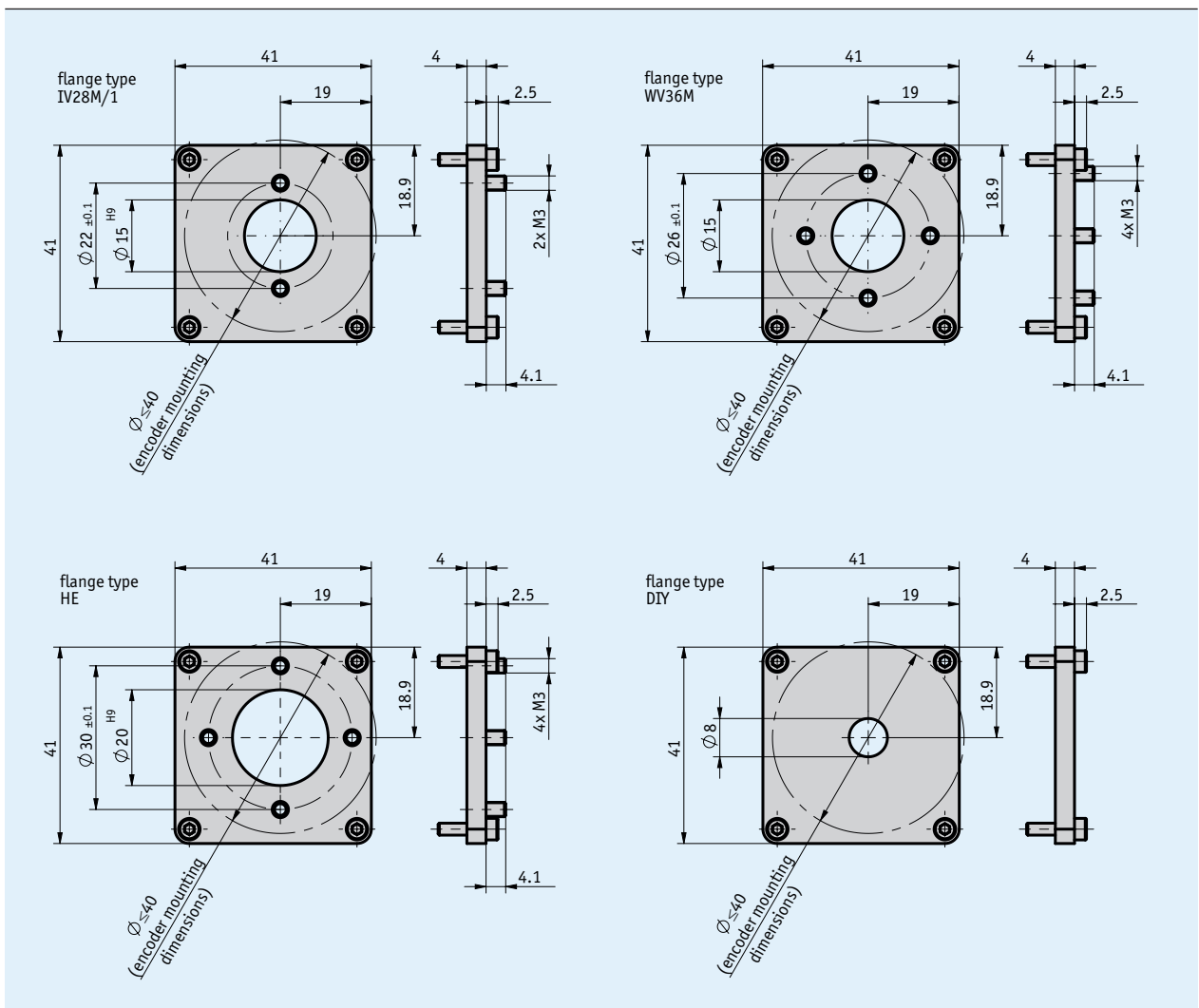
Scope of delivery: SV, User information

Profile

- For easy mounting of rotary encoders to SG21
- For rotary encoders with max. $\varnothing 40$ mm
- Diverse variants available
- Basic version (DIY) for own adjustments



3.3

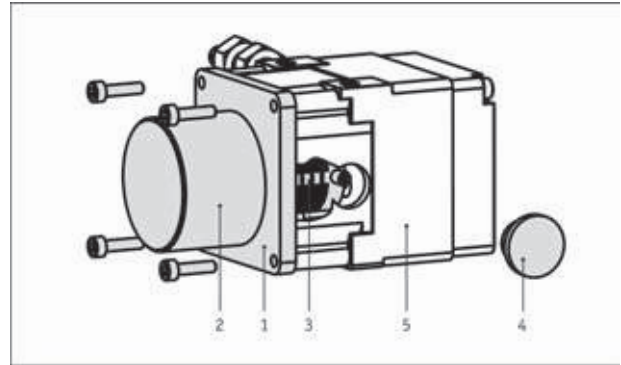


Mechanical data

Feature	Technical data	Additional information
Material	aluminum	

Hint for mounting

Mount the mounting flange [1] directly on the encoder flange [2]. After mounting the self-aligning coupling [3] on the encoder shaft, place the rotary encoder with flange and coupling on the cable housing [5]. Screw the flange to the housing and fasten the coupling through the lateral hole on the drum shaft of the cable. The plastic cover [4] prevents foreign bodies from entering the cable housing. For detailed instructions regarding encoder mounting refer to the user information of the SG21 wire-actuated encoder



Order

■ **Ordering information**

one or more system components are required:

- Absolute encoder WV36M/CAN
- Absolute encoder WV36M/SSI
- Incremental encoder IV28M/1
- Wire-actuated encoder SG21

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www.siko-global.com
www.siko-global.com
page 26

■ **Ordering table**

Feature	Ordering data	Specification	Additional information
Flange type	IV28M/1	for IV28M/1 rotary encoder	
	WV36M/SSI A	for WV36M/CAN and WV36M/SSI rotary encoders	
	HE	for rotary encoder with bolt circle ø30 mm	
	DIY	processing of the flange for the encoder by the customer	


■ **Order key**

ZB4002 -

Scope of delivery: ZB4002, fastening screws for flange and encoder

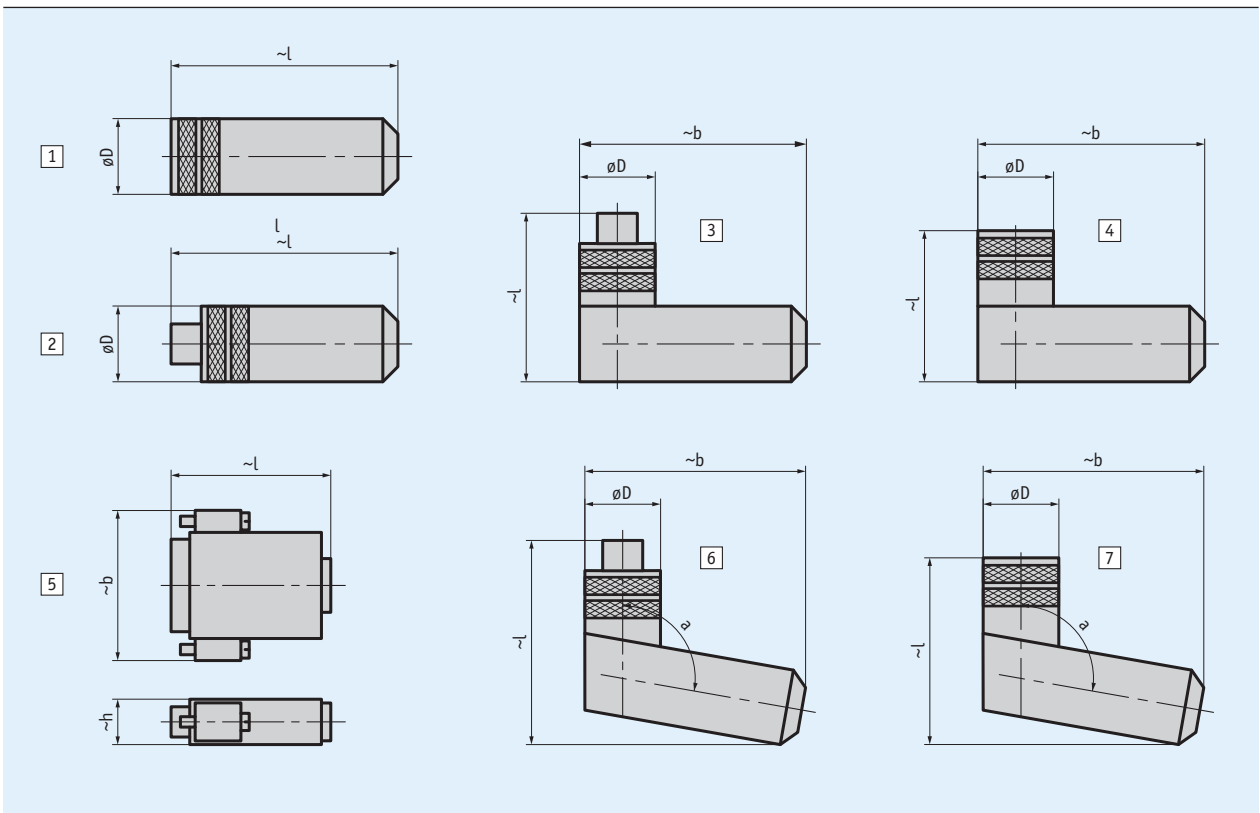
Profile

- Mating connector, straight
- Mating connector, offset
- D-SUB connector
- Bus terminator, straight

 When screwed, the distance to the device will increase by approx. 3 mm.



3.3



Order

■ Overview of orders

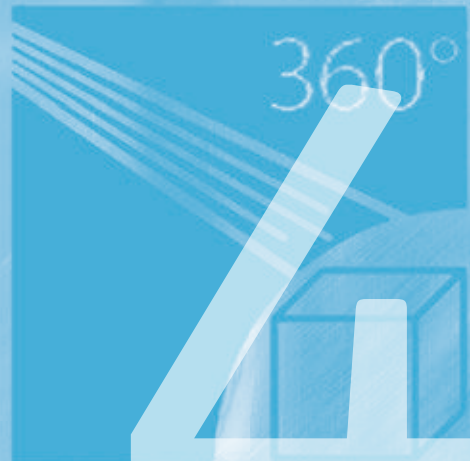
Order key	Picture	Type	PIN	Name	ø Cable	øD	l	b	h	a
71364+71365	5	D-SUB	9	pin+shell	≤8.5		35	31	15.5	
71366+71365	5	D-SUB	9	socket+shell	≤8.5		35	31	15.5	
73947+73946	5	D-SUB	15	socket+shel	≤8.5		42	40	15.2	
76141	1	M16	7	socket	4 ... 6	18.5	61			
76572	1	M16	12	socket	6 ... 8	18.5	62			
77087	1	M16	7	socket	6 ... 8	18.5	62			
78088	4	M16	7	angle socket	4 ... 6	20	38	54		
79665	4	M16	7	angle socket	6 ... 8	20	38	54		
79666	4	M16	12	angle socket	6 ... 8	20	38	54		
81351	1	M9	8	socket	3.5 ... 5	14	38			
81363	4	M16	3	angle socket	4 ... 6	20	38	54		
81487	1	M9	3	socket	3.5 ... 5	14	38			
81935	1	M23	12	socket	≤8.5	26	51.1			
82182	1	M16	3	socket	4 ... 6	18.5	61			
82247	4	M9	4	angle socket	3.5 ... 5	14	30	30.5		
82366	4	M9	3	angle socket	3.5 ... 5	14	30	30.5		
82804	7	M12 B-Cod.	5	angle socket	4 ... 8	19	48	41		100°
82805	6	M12 B-Cod.	5	angular pin	4 ... 8	19	50	41		100°
82815	2	M12 A-Cod.	5	bus terminating plug (CAN)		14.5	55			
82816	2	M12 B-Cod.	5	bus terminating plug (PB)		14.2	44			
83006	7	M12 A-Cod.	5	angle socket	4 ... 8	19	48	41		100°
83007	6	M12 A-Cod.	5	angular pin	4 ... 8	19	50	41		100°
83091	7	M12 A-Cod.	4	angle socket	4 ... 8	19	48	41		100°
83419	1	M12 A-Cod.	4	socket	4 ... 6	20	54			
83447	1	M9	4	socket	3.5 ... 5	14	38			
83525	1	M12 A-Cod.	8	socket	6 ... 8	20	57			
83526	1	M12 A-Cod.	4	socket	6 ... 8	20	57			
83527	2	M12 A-Cod.	8	pin	6 ... 8	20	62			
83991	1	M12 B-Cod.	5	socket	6 ... 8	20	57			
83992	2	M12 B-Cod.	5	pin	6 ... 8	20	62			
84109	1	M12 A-Cod.	5	socket	6 ... 8	20	57			
84209	1	M8	4	socket	3.5 ... 5	12	43			
84210	2	M8	4	pin	3.5 ... 5	12	50			
84732	2	M12 A-Cod.	5	pin	6 ... 8	20	62			
85057	1	M16	3	socket	6 ... 8	18.5	62			
85058	4	M16	3	angle socket	6 ... 8	20	38	54		
85277	1	M12 A-Cod.	12	socket	6 ... 8	20	57			
85278	4	M12 A-Cod.	12	angle socket	6 ... 8	20	38	54		
87599	7	M12 A-Cod.	8	angle socket	4 ... 8	19	48	41		100°
87600	3	M12 D-Cod.	4	angular pin	6 ... 8	20	42	54		
87601	2	M12 D-Cod.	4	pin	6 ... 8	20	63			
BAS-0005	2	M8	4	bus terminating plug		12	45			

■ Order key

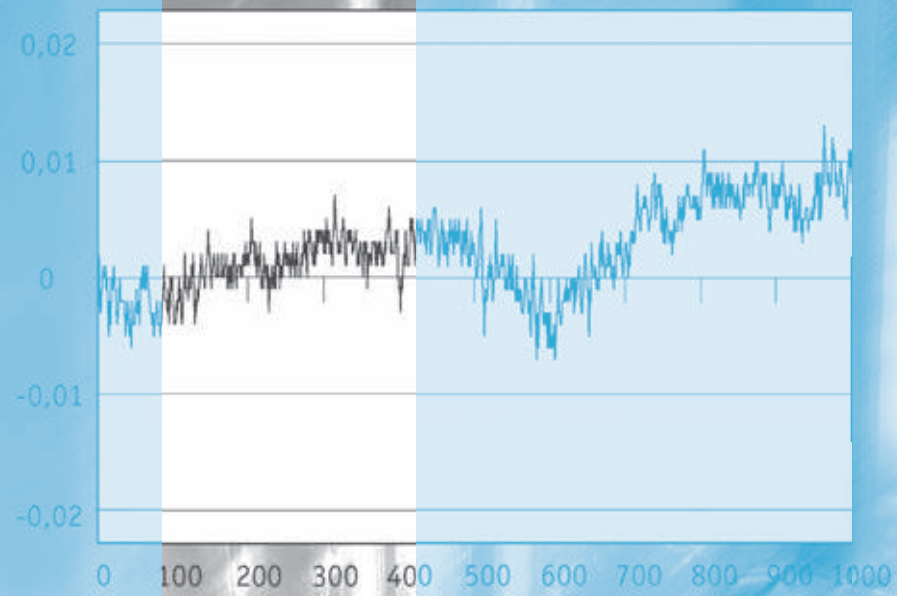


Scope of delivery: mating connector

3.4



[mm] tolérance



longueur L [mm]



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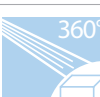

3.5


Protection classes according to DIN EN 60529


IP ..

Touch and foreign bodies protection

Water protection

Touch and foreign bodies protection		Water protection	
	0 No protection.		0 No protection.
	1 Protected against access with the back of the hand. Protection against solid foreign bodies with $\varnothing > 50$ mm.		1 Protection against vertical water drips.
	2 Protected against contact with a finger. Protected against solid foreign bodies with diameters > 12.5 mm.		2 Protection against vertical water drips if the housing is tilted up to $\pm 15^\circ$.
	3 Protected against access with a tool. Protected against solid foreign bodies with diameters > 2.5 mm.		3 Protection against spray up to $\pm 60^\circ$ towards verticality.
	4 Protected against access with a wire. Protected against solid foreign bodies with diameters > 1.0 mm.		4 Protection against splash water coming from any angle.
	5 Full protection against contact. Protection against harmful quantities of dust.		5 Protection against hose water (nozzle) coming from any angle.
	6 Full protection against contact. Dust-proof.		6 Protection against strong hose water coming from any angle.
			7 Protection against temporary immersion.
			8 Protection against continuous immersion.
			9k* Protection against ingress of water during high pressure or steam-jet cleaning, specific for road vehicles.

 The standards deal with the protection of electric equipment by means of housings, covers and so forth. For purely mechanical devices, the information is used figuratively.

 The two numbers are not indicative of the protection against ingress of oils or similar liquids. The second figure indicates the protection class exclusively for water.

* IPx9k is not part of DIN EN 60 529, rather it is contained in DIN 40 050

3.4

3.5



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SDE04

SGP/1

SG20

UR

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3.5

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Headquarters:
 **SIKO GmbH**
Weihermattenweg 2
D-79256 Buchenbach

Phon
+49 7661 394-0
Fax
+49 7661 394-388

E-Mail
info@siko.de

Subsidiaries:
 **SIKO Products Inc**

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