

Joystick

Angular Position Transducer

Rope Length Transmitter

Tilt Angle Sensor

Pedal Actuated Transmitter

Wind sensor





THE ROPE LENGTH TRANSMITTER

Rope Length Transmitters were used for length and speed measurements of linear movement operations in several applications. Particularly they are easy to mount and have flexible designs. Besides a number of customized solutions we have three standard designs which can be used in different applications for length measurements. All three designs con-

tain in a flat plastic or robust aluminium casing a low-mass high-precise measuring drum with extremely solid spring-return. The winding of the robust high-flexible steel rope will be on one layer. All standard designs have a flange, coupling or gear adaptation and are suitable for adaptation of own encoder systems or for customary in trade encoder systems.



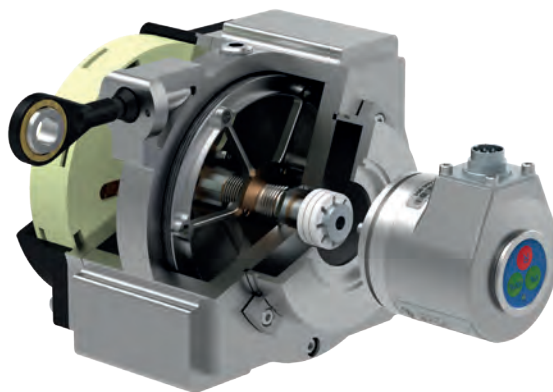
LOW-COST VERSIONS FOR MEASURING
RANGES UP TO MAX. 5.000 MM



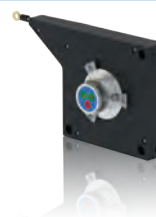
LOW-PRICED METAL DESIGN FOR MEASURING
RANGES UP TO MAX. 15.000 MM



ROBUST, INDUSTRIAL VERSION FOR LARGE
MEASURING LENGTHS UP TO MAX. 60.000 MM



System versions



Mechanical Data

Series	SL001250/GS55	SL003000/GS80	SL005000/GS130	SL0010/GS190
Lengths up to 1.25 m	●	–	–	–
Lengths up to 3 m	–	●	–	–
Lengths up to 5 m	–	–	●	–
Lengths up to 10 m	–	–	–	●
Casing material	Plastic, noryl	Plastic, noryl	Plastic, noryl	Plastic, noryl
circumference of drum (incl. wire)	150 mm	230 mm	385 mm	555 mm
Measuring wire - Ø	0,45 mm	0,55 mm	0,55 mm	0,55 mm
Wire material	1.4401	1.4401	1.4401	1.4401
Linearity *	± 0.01 %	± 0.01 %	± 0.01 %	± 0.01 %
Reproducibility *	0.005 %	0.005 %	0.005 %	0.005 %
Hysteresis *	0.1 %	0.1 %	0.1 %	0.1 %
Speed adjustment	6 m / s	6 m / s	3 m / s	3 m / s
Spring return strength	1 - 1.4 N	3.3 - 4.4 N	4.5 - 7 N	9 - 12 N
Life time (typical) **	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles
Temperature range	– 30° C up to +70° C	– 30° C up to +70° C	– 30° C up to +70° C	– 30° C up to +70° C
IP code of casing	IP 50	IP 50	IP 50	IP 50
Weight without encoder	80 g	250 g	800 g	1900 g

Other

Customized features	Low-cost-version, flat design, drum bearing via encoder shaft, mounting of customary encoders	Low-cost-version, flat design, drum bearing via encoder shaft, mounting of customary encoders	Low-cost-version, flat design, drum bearing via encoder shaft, mounting of customary encoders	Low-cost-version, flat design, drum bearing via encoder shaft, mounting of customary encoders
Article number	5934Z05	5935Z02	5945Z01	5956Z02

Electric data on page 8

* referring to measuring value of Rope Length Mechanic without encoder system

** The life cycle is dependent to the type of load. Factors of influence are: environmental conditions, mounting conditions, used measuring range, traverse speed as well as acceleration.

System versions



Mechanical Data

Series	SL02/GS80	SL03/GS80	SL05/GS130
Lengths up to 2 m	•	–	–
Lengths up to 3 m	–	•	–
Lengths up to 5 m	–	–	•
Casing material	Aluminium, anodized	Aluminium, anodized	Aluminium, anodized
circumference of drum (incl. wire)	200 mm	200 mm	333.3 mm
Measuring wire - Ø	0.55 mm	0.55 mm	0.55 mm
Wire material	1.4401	1.4401	1.4401
Linearity *	± 0.1 %	± 0.1 %	± 0.1 %
Reproducibility *	0.01 %	0.01 %	0.01 %
Hysteresis *	0.05 %	0.05 %	0.05 %
Speed adjustment	8 m / s	8 m / s	8 m / s
Spring return strength	5 - 15 N	5 - 15 N	15 - 20 N
Life time (typical) **	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles
Temperature range	– 30° C up to +70° C	– 30° C up to +70° C	– 30° C up to +70° C
IP code of casing	IP 64	IP 64	IP 64
Weight without encoder	1 kg	1.1 kg	2 kg

Other

Customized features	Robust alu drum casing, low priced version to SL-series, additional dust protection by bellows	Robust alu drum casing, low priced version to SL-series, additional dust protection by bellows	Robust alu drum casing, low priced version to SL-series, additional dust protection by bellows
Article number	5932Z20	5932Z20	5930Z20

Electrical data on page 8

System versions



Mechanical Data

Series	SL3000/GS80	SL3000/GS130	SL3000/GS190
Lengths up to 1 m	•	–	–
Lengths up to 2 m	•	–	–
Lengths up to 3 m	•	–	–
Lengths up to 5 m	–	•	–
Lengths up to 10 m	–	•	–
Lengths up to 15 m	–	•	–
Lengths up to 20 m	–	•	–
Lengths up to 25 m	–	•	–
Lengths up to 30 m	–	•	•
Lengths up to 35 m	–	–	•
Lengths up to 40 m	–	–	•
Lengths up to 50 m	–	–	•
Lengths up to 60 m	–	–	•
Casing material	Aluminium, anodized	Aluminium, anodized	Aluminium, anodized
circumference of drum (incl. wire)	200 mm	334.1 mm / 332.4 mm ***	491.5 mm
Measuring wire - Ø	1.35 mm	1.35 mm / 0.81 mm ***	1.35 mm
Wire material	1.4401	1.4401	1.4401
Linearity *	± 0.05 %	± 0.05 %	± 0.05 %
Reproducibility *	0.01 %	0.01 %	0.01 %
Hysteresis *	0.05 %	0.05 %	0.05 %
Speed adjustment	8 m / s	8 m/s, 6 m/s, 3 m/s	4 m/s
Spring return strength	5 - 15 N	10 - 21 N	18 - 37 N
Life time (typical) **	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles	up to 500.000 Load change cycles
Temperature range	– 30° C up to +70° C	– 30° C up to +70° C	– 30° C up to +70° C
IP code of casing	IP 64	IP 64	IP 64
Weight without encoder	0.9 kg / 1.1 kg / 1.5 kg	2.5 kg / 3.5 kg / 5 kg / 6 kg / 7.5 kg / 8.5 kg	14.2 kg / 16 kg / 20 kg / 14.5 kg / 15.5 kg

Other

Customized features	Robust alu casing, high operational safety and measuring accuracy, mounting of any accessories possible, EX-approval available (GS80 and GS130 only), V4A version available (GS80 and GS130 only) 	Robust alu casing, high operational safety and measuring accuracy, mounting of any accessories possible, EX-approval available (GS80 and GS130 only), V4A version available (GS80 and GS130 only) 	Robust alu casing, high operational safety and measuring accuracy, mounting of any accessories possible, EX-approval available (GS80 and GS130 only), V4A version available (GS80 and GS130 only)
Article number	5932Z01	5930Z01	5931Z01

Electric data on page 8

* referring to measuring value of Rope Length Mechanic without encoder system

** The life cycle is dependent to the type of load. Factors of influence are: environmental conditions, mounting conditions, used measuring range, traverse speed as well as acceleration.

*** While using a measuring wire with Ø 0.81 mm the model is shortened.

System versions



Mechanical Data

Series	SL004/GS70	SL010/GS125	SL03/GS160	SL20/GS190
Lengths up to	3.5 m	10 m	3 m	20 m
Casing material	Aluminium	Aluminium	Aluminium	Aluminium
circumference of drum (incl. wire)	350 mm	333 mm	450 mm	500 mm
Measuring wire - Ø	2 mm	0.55 mm	3 mm	2 mm
Wire material	1.4401	1.4401	1.4401	1.4401
Linearity *	± 0.2 %	± 0.1 %	± 0.2 %	± 0.1 %
Reproducibility *	0.1 %	0.2 %	0.2 %	0.1 %
Hysteresis *	0.2 %	0.2 %	0.2 %	0.1 %
Speed adjustment	1 m / s	1 m / s	0.2 m / s	4 m / s
Spring return strength	12 N - 15 N	3.5 N - 15 N	40 N - 65 N	24 N - 37 N
Life time (typical) **	up to 1 Mio. Load change cycles	up to 1 Mio. Load change cycles	100,000	500,000
Temperature range	- 30° C up to +70° C	- 30° C up to +70° C	- 30° C up to +70° C	- 30° C up to +70° C
IP code of casing	IP 65	IP 40	IP 66	IP 65
Weight without encoder	1.8 kg	3 kg	3.7 kg	10 kg

Electrical data

Voltage output	0.5 - 4.5 V	2 x 1, 2, 5, 10 kOhm ± 10%	2 x 1, 2, 5, 10 kOhm ± 10%
Current output	4 - 20 mA	4 - 20 mA, on request	4 - 20 mA, on request
Signal output current	3- wire system	3- wire system	3- wire system
Max. burden current output	600 Ω	600 Ω	600 Ω
Bus output	CANopen safety	CANopen, on request	CANopen, on request
Signal calibration	Firm calibration	Firm calibration	Firm calibration
Supply	9 - 48 V DC	18 - 36 V DC	18 - 36 V DC
Current consumption	< 80 mA	< 80 mA	< 80 mA
Test voltage	500 V, 50 Hz, 1 min	500 V, 50 Hz, 1 min	500 V, 50 Hz, 1 min
Interference immunity	EN 61 000-6-2	EN 61 000-6-2	EN 61 000-6-2
Emitted interference	EN 61 000-6-4	EN 61 000-6-4	EN 61 000-6-4

Electrical
data
on
page 8

Other

Article number	5966Z01	5942Z02	5946Z01	5955Z50
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System versions		magnetic	potentiometric	magnetic	magnetic
					
Mechanical Data					
Series		MH64/GS60	PK1023	MH16-613	MH64-1023
Casing - Ø		59.5 mm	60 mm	36.5 mm	60 mm
Casing material		Aluminium, anodized	Alu, anodized / stainless steel	Aluminium, anodized	Alu, anodized / stainless steel
Casing length without shaft		ca. 42 mm	ca. 67 mm	ca. 37 mm	ca. 67 mm
IP code of casing up to		IP67	IP67	IP65	IP67
Shaft - Ø		6 mm	6 oder 10 mm	6 mm	6 oder 10 mm
Shaft material		Stainless steel	Stainless steel	Stainless steel	Stainless steel
Shaft bearing		Ball bearing	Double ball bearing	Ball bearing	Ball bearing
Angle of rotation max.		64 x 360°	360°	16 x 360°	64 x 360°
Temperature range		-30°C up to +80°C	-30°C up to +80°C	-30°C up to +80°C	-30°C up to +80°C
Shock		25 g, 11 ms	50 g, 6 ms	50 g, 6 ms	50 g, 6 ms
Vibration		4 g Sinus, 5 - 100 Hz	4 g Sinus, 5 - 100 Hz	10 g Sinus, 5 - 200 Hz	4 g Sinus, 5 - 100 Hz
Connection		Plug / cable	Plug / cable	Plug / cable / soldered connection	Plug / cable
Weight		160 g	100 g	100 g	400 g
Electrical Data					
Electronics		redundant	–	single	redundant
Voltage output		–	1, 2, 5, 10 kOhm ± 10%	0 - 10 V DC	0 - 10 V DC
Current output		4 – 20 mA	–	4 – 20 mA	4 – 20 mA
Max. burden Current output		250 Ω / 500 Ω *	–	600 Ω	600 Ω
Bus output		CANopen / CANopen-safety	–	CANopen, on request	CANopen / CANopen-safety
Signal adjustment		Fixed alignment	–	Push button for analogue signal	Push button for analogue signal
Linearity		± 0.2 %	± 0,1 %	< ± 0,2 %	± 0,2 %
Resolution		14 bit	almost infinite	16 bit	4 + 14 bit
Supply ¹⁾		6 – 35 V DC	–	18 – 33 V DC	18 – 36 V DC
Current consumption		< 50 mA	–	< 80 mA	< 80 mA
Temperature coefficient		0,1° / 10K	0,1° / 10K	0,1° / 10K	0,1° / 10K
Test voltage		500 V, 50 Hz, 1 min	500 V, 50 Hz, 1 min	500 V, 50 Hz, 1 min	500 V, 50 Hz, 1 min
Interference immunity		EN 61 000-6-2	EN 61 000-6-2	EN 61 000-6-2	EN 61 000-6-2
Emitted interference		EN 61 000-6-4	EN 61 000-6-4	EN 61 000-6-4	EN 61 000-6-4
Other					
SL00	GS 55	•	–	•	–
SL00	GS 80	•	•	•	•
SL00	GS 130	–	•	•	•
SL0	GS 80	•	•	–	•
SL0	GS 130	•	•	–	•
SL3000	GS 80	•	•	–	•
SL3000	GS 130	•	•	–	•
SL3000	GS 190	•	•	–	•
Customized features		–	–	–	–
Article number		5758F20	5710Z02	2750Z05	5755Z03

¹⁾ others on request

The complete range of encoder types can be found in FSG catalogue precision rotary potentiometer.

WIRE HOOKS

for several fastening possibilities

**BALL JOINT**

to avoid the measuring wire becoming bent

**WIRE OUTLET**

with steel head bellow to protect against ice and water

**BRUSH ATTACHMENT**

for extremely dusty and scaled environmental conditions

**COMPRESSED AIR**

attachment to avoid dust and dirt entry

**GUIDE PULLEY**

for straight wire withdrawal to wire hook

**DOUBLE GUIDE PULLEY**

for measuring objects with direction change-ment of wire withdrawal



WORLD

WIDE

INTERNATIONAL



BERLIN (HEADQUARTERS)

- founded in 1946
- total production area: 3500 m²
- number of employees: 170
- company management and sales
- design and development
- production and assembly



HEPPENHEIM

- founded in 1961
- total production area: 2700 m²
- number of employees: 40
- production and assembly





4

locations in germany

12

representations worldwide

70

years in the market

90

percent vertical range of manufacture

450

employees

KÖNIGS WUSTERHAUSEN/OT KABLOW

- founded in 1992
- total production area: 5000 m²
- number of employees: 180
- production and assembly



KÖNIGS WUSTERHAUSEN/OT ZERNSDORF

- founded in 2017
- number of employees: 60
- total production area: 4300 m²





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