MAGLINE MICRO
MAGLINE BASIC
MAGLINE MACRO
MAGLINE ROTO

Incremental

Magnetic Length Measuring Systems

...precision
with each step

SIKO

MAGLINE MICRO

Especially suitable for precise and highly dynamic processes on linear guide systems and applications in the field of motive power engineering. MAGLINE MICRO is a magnetically sensing incremental system with programmable resolutions of up to 0.2 µm and a measuring accuracy of up to 10 µm. MAGLINE MICRO operates without wear, with measuring values captured contactlessly. This makes the system a robust and economic alternative to optical measuring systems.

mm

MAGLINE BASIC

This system combines all advantages of the contactless magnetic measuring technology and offers resolutions of up to 1 µm and a measuring accuracy of up to 50 µm. MAGLINE BASIC is available both as an incremental or absolute measuring system. MAGLINE BASIC measures incrementally as well as absolutely and either provides digital encoder signals or directly displays the values measured at the position the sensor is placed.

The incremental measuring system: the easy and economic solution for standard mechanical engineering applications.

the absolute measuring system: for all applications that must be able to detect movements even without operating voltage.

MAGLINE MACRO

Especially designed for very long measuring lengths. A system for measuring lengths of 160 meters and more – incrementally or absolutely. Digital signal outputs allow data transmission of the measured values via the standard interfaces with a resolution of up to 0.25 mm to a display unit or a master control.

MAGLINE ROTO

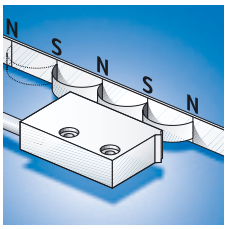
Primarily developed for direct angle and rotation recording with all the advantages of magnetic, contactless sensing. Appropriate sensors register the incremental segmentation of magnet rings at a maximum resolution of 200,000 pulses per revolution.

Contents

MAGLINE^{BASIC} Incremental Magnetic Length Mesuring System

MAGLINE^{BASIC} the basic system for incremental measurement!

The magnetic linear system: insensitve to contamination.



MAGLINE^{BASIC} and its functional principle: Contactless sensing of magnetic fields and translation of measured analog values into digital signals or direct display values.

The core of the MAGLINE^{BASIC} measuring system is a scale consisting of a flexible steel band and a magnetic layer, regularly magnetised with north and south poles. The length of the intervals mainly determines the system's resolution and accuracy. For mounting the band is simply glued to the machine base and mechanically protected by a polished stainless steel cover strip.

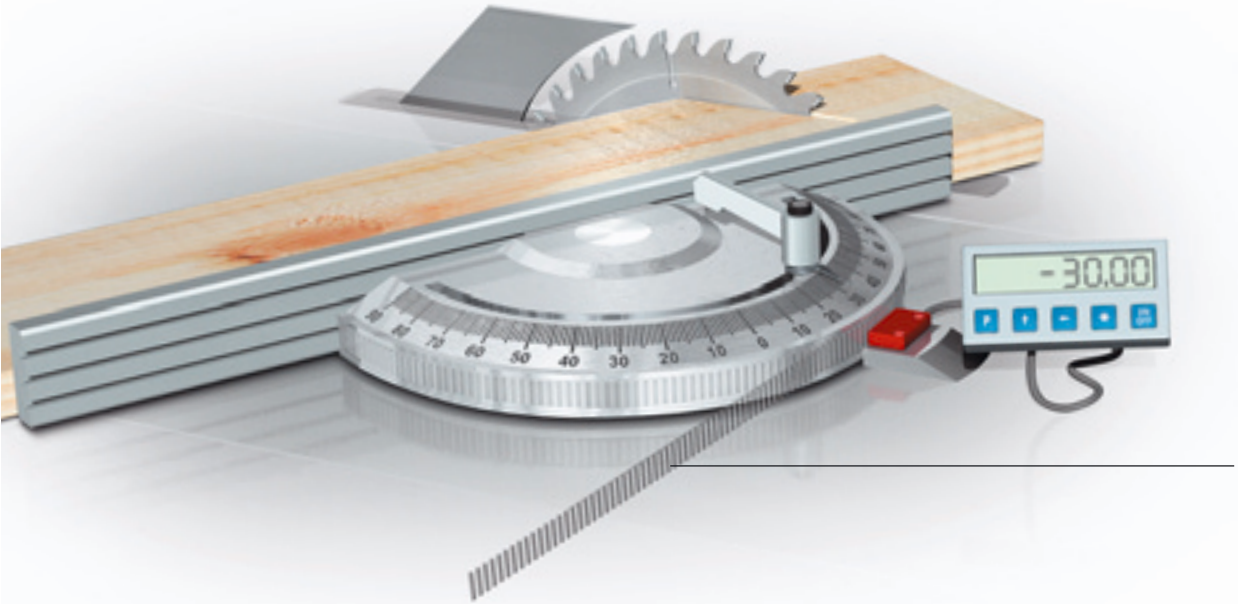
For measurement and position indication the sensor travels along the magnetic band, contactlessly sensing the path information. Depending on the system's precision and maximum resolution, distances and tolerances of up to 2 mm are allowed between sensor and magnetic band. A special conversion method deduces from the analog measuring signals the length or angle information and the moving direction. There are two possibilities for processing these values: direct display on the machine (via an electronic display unit) or data transfer to a master control via standard incremental interfaces (phase-shifted quadrature signals). MAGLINE^{BASIC} is available with interfaces for all standard bus systems and can thus be easily integrated into nearly every industrial control system.

Distance and angle measurement is a standard task in machinery-building and engineering industries. For many years SIKO's modern and cost-saving MAGLINE products have proved to be in line with market requirements. The contactless measuring principle avoids the disadvantages of conventional measurement systems – such as rotary encoders with rack and pinion, wire-actuated transducers or optical systems – and offers many advantages due to its extreme versatility.

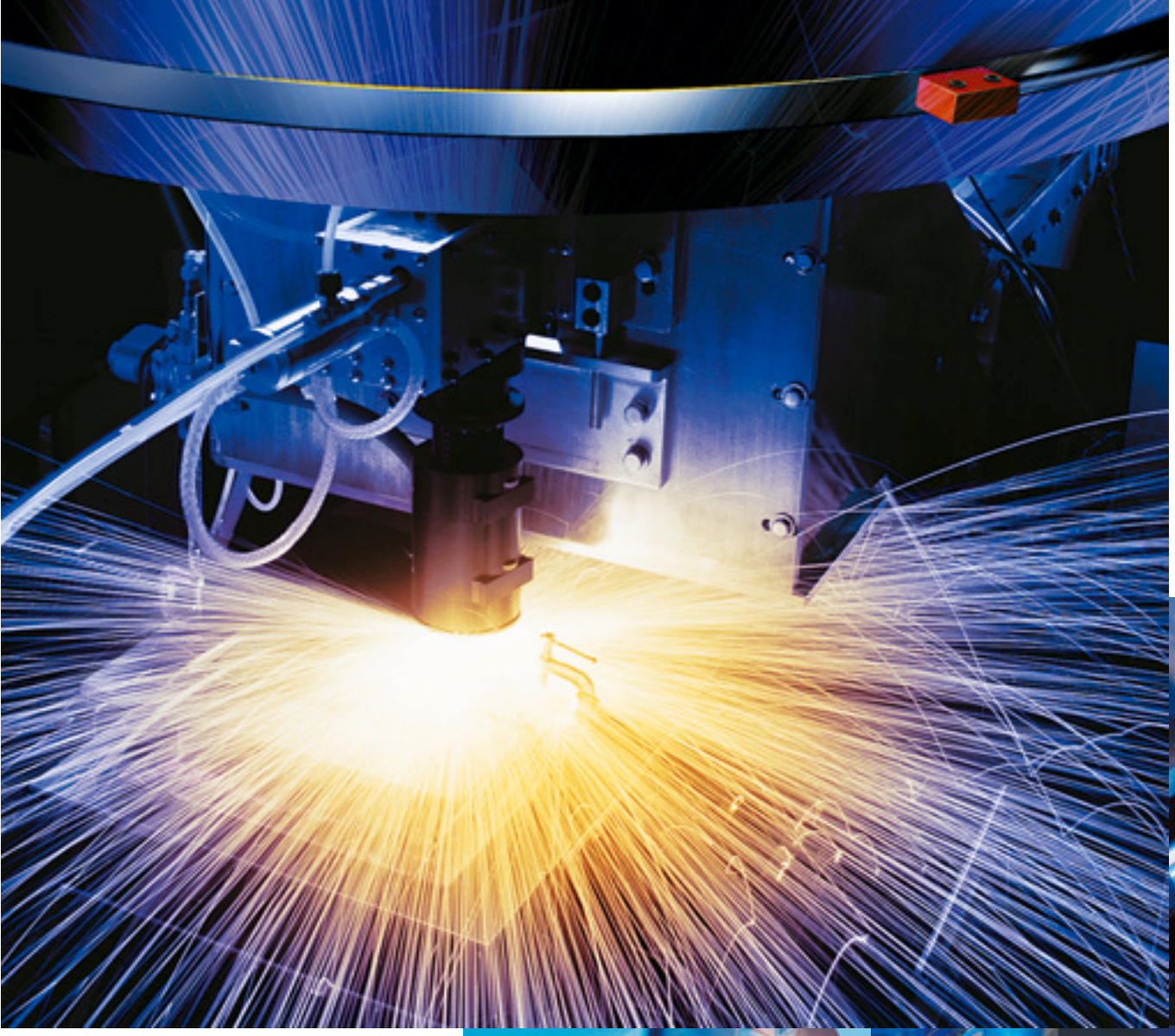
The MAGLINE system is an economic solution for a wide range of measuring tasks requiring long measuring lengths, high precision and easy handling. All standard industrial interfaces for connection to control or bus systems are available.

A wide range of different types, system combinations, accessories and special solutions make the fully developed MAGLINE product line suitable for nearly every measuring task in machinery-building industry.

MAGLINE^{BASIC}



The magnetic band is the scale of the measuring system. For easy angle measurement its flexible design enables even curved mounting on a small radius.



Position values are shown on the display directly on the machine thanks to purpose-developed, highly integrated technology.

The Incremental System

Typical applications

MAGLINE^{BASIC} as an incremental solution is used in nearly all areas of mechanical engineering. It is ideal for linear measurement on limit stop adjustments or for angle measurement, e.g. applications with mitre saws.

Installation directly on or near to positioning or finishing processes prevents the occurrence of corrupted or inaccurate measuring val-ues due to gearbox play or spindle tolerances. The contactless scanning method is wear-resistant. Furthermore, the system is very tolerant towards contamination caused by dust, shavings and liquids.

Application and Operating Priciples

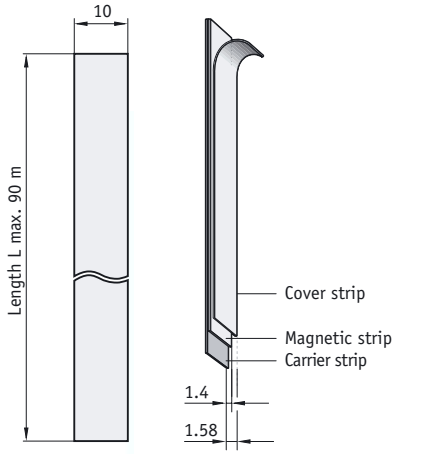
MAGLINE^{BASIC} and its incremental components

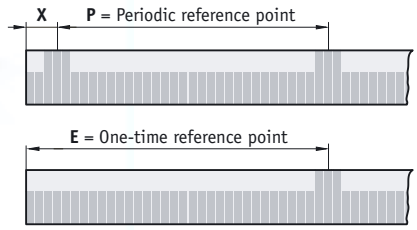
Up to 90 m length available, **system accuracy**± (**x** + 0.01 x L) mm, **L** = length of magnetic band in m

Magnetic strip	Sensor	Magnetic display/ Translation module	Customer technical requirements (counters, controls...), precision class (**x**)
MB200 	MSK210 		PP/LD (RS422) 0.05
MB320 	MSK320 		PP/LD (RS422) 0.1
MB500 	MS500 	MA502 	0.05
		MA506 	0.1
		AS510/1 	PP/LD (RS422) 0.025
	MSK5000 		PP/LD (RS422) 0.025
	MA503/1 		0.1
	MA501 		RS485 0.1
	MA562 		0.1

Magnetic Strip MB...

The base material is magnetised at defined distances and firmly joined to a steel carrier strip. For fixing, a special adhesive tape is premounted. An additional stainless steel cover strip is also included as standard.





Features:

- easy mounting by glueing
- insensitive to dust, shavings,humidity ...

Attention! In case of danger of corrosion (e.g., salt-water or similar environmens), VA carrier strip available as an option. Additional mechanical protection via type PS1 profile rail. When using cooling lubricants or similar substances please take notice of the specific mounting instructions (on request)

Reference points, all in m

Type	X	P	E
MB200	0.05	0.2/ 0.5	0.05/ 0.1/ 0.2/ 0.5
MB320	0.32	0.032/ 0.64	0.032/ 0.064/ 0.128/ 0.32
MB500	0.05	0.2/ 0.5	0.05/ 0.1/ 0.2/ 0.5/ 0.9/ 1.3/ 2.0

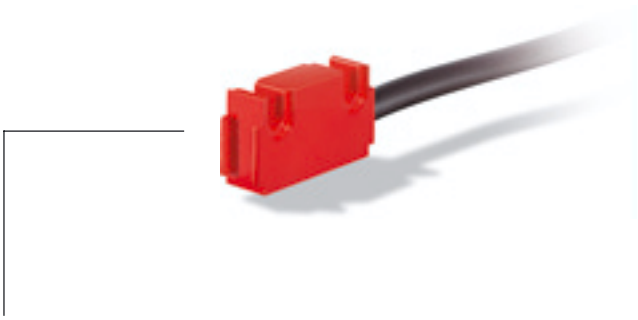
Feature	Ordering data		Technical data		Additional information
Magnetic strip type	MB200	MB320	MB500		
Length	...	...	... A	in 0.1 m steps, max. 90 m	ordered length = effective measuring length + 0.1 m
Width	**10**	**10**	**10** B	**in mm**	**standard**
		5	5		
Precision class*	**0.05**	**0.1**	**0.1**	**0.1 mm**	**standard**
			0.05	0.05 mm	only for 10 mm width
Cover strip	**AM**	**AM**	**AM** D	**with**	**standard**, stainless steel
	A0	A0	A0	without	
Reference point	**0**	**0**	**0** E	**without**	**standard**
	E	E	E	one-time, see F feature	only for 10 mm width
	P	P	P	periodic, see G feature	only for 10 mm width
Position of E reference point	**0.05**	**0.032**	**0.05**	**in m**	**standard**, see drawing
(one-time)	0.1	0.064	0.1		
	0.2	0.128	0.2		
	0.5	0.320	0.5		0.9 / 1.3 / 2.0 (other reference points: MB500)
or					
Position of P reference point	**0.2**	**0.32**	**0.2** B	**in m**	**standard**, see drawing
(periodic)	0.5	0.64	0.5		
Thickness				1.7 mm	incl. cover strip
Temperature coefficient				(11±1) µm/K	
Temperature ranges				working temperature -20 ...+70 °C	storage temperature -40 ...+70 °C
Mounting type				glued joint	

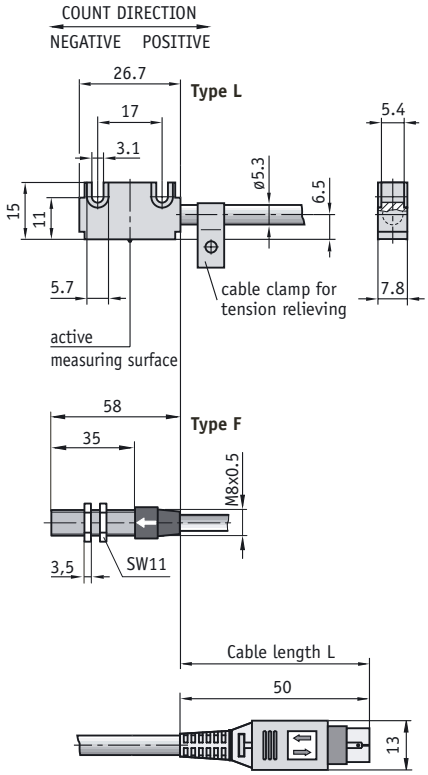
*only valid for magnetic strips without reference point

Your order: MB ... – [A] – [B] – [C] – [D] – [E] – [F] – [G]

Magnetic Sensor MS500

The information of the magnetic strip is sensed contactlessly. A connection cable permanently attached to the sensor transmits the information to the translation module or magnetic display.





Features:

- small, compact design of sensor and connector
- robust housing
- insensitive to dust, shavings, humidity
- MB500 magnetic strip

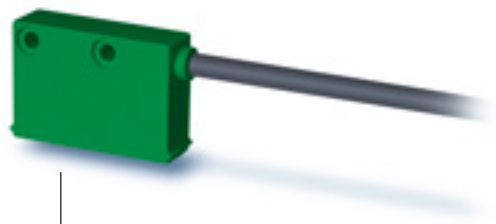
Attention! No modification of the sensor connection is permitted (e.g., other cables/cable lengths/...)

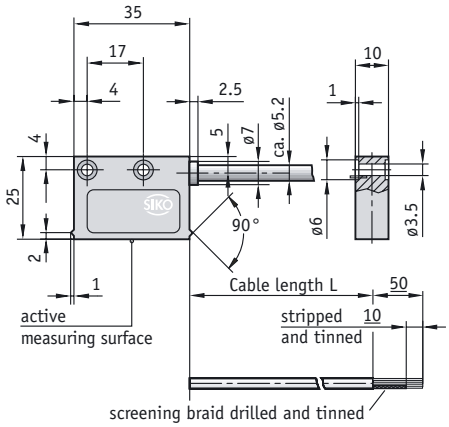
Feature	Ordering data	Technical data	Additional information
Sensor type	**L** A		**standard**
	F		
Cable length	**2.0** B	**in meter, available up to max. 20 m**	**standard**
Sensor head design		26.7 x 7.8 x 15 mm (L sensor type)	
		M8 x 35 mm (F sensor type)	
Housing material		aluminium, red varnish (L sensor type)	
		steel (F sensor type)	
Electrical connection		Mini-DIN 6-pin	PVC cable (guided-chain capable)
Precision class		depends on connection with follower electronics	
Sensor temperature ranges		working temperature: -20 ... +70 °C	storage temperature: -20 ... +85 °C
Connector temperature range		working temperature: 0 ... +60 °C	
Protection class, test mark		3 according to IEC 801	CE
Humidity		100 % rH, condensation permitted	
Type of protection		IP 67	according to DIN VDE 0470
Vibration resistance		[5...2000 Hz] at 20 g	
Shock resistance		200 g at 11 ms	

Your order: MS500 – [A] – [B]

Magnetic Sensor MSK210

As a component of a magnetically operating, open and robust measuring system, this sensor with integrated translation module has a direct digital signal output. Used in combination with the MB200 magnetic strip, this sensor forms an open, robust linear measuring system.





Sensor / Strip assignment for R reference signal

Features:

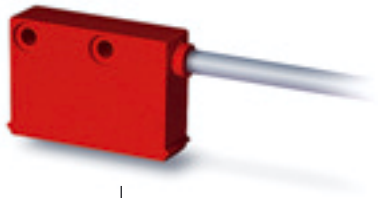
- insensitive to dust, shavings, humidity
- IP67 type of protection
- max. resolution 0.025 mm
- real-time data processing
- fixed reference point

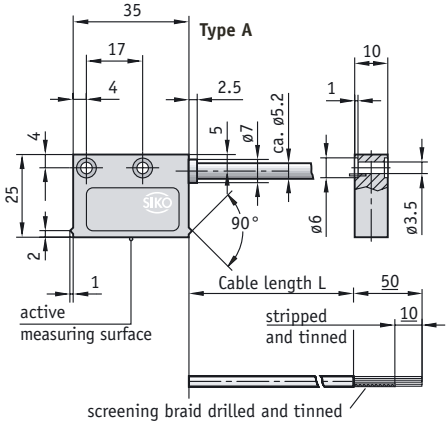
Feature	Ordering data		Technical data	Additional information
Operating voltage	**4**	A	**24 V DC ± 20 %**	**standard, with polarity protection**
	5		5 V DC ± 5 %	
Design	**A**	B		**standard**
Connection/cable length	**E1/2.0**	C	**flying lead, 2 m cable**	**standard** (max. 20 m cable length)
	E6, E8		E6, circular plug	E8, D-SUB 9-pin
Output circuit	**PP**	D	**push-pull**	**standard**, only operating voltage 4
	LD		line driver	
	TTL			only for non-inverted output signal, cable length max. 5.0 m
Output signal	**NI**	E	**not inverted**	**standard**
	I		inverted	standard with reference signal I or R
Reference signal	**0**	F	**with**	**standard**
	I		periodic index	
	R		fixed index	not possible for resolution 0.5 mm
Resolution	**0.025**	G	**0.025 mm**	**standard**, options 0.05/0.1
Power consumption			max. 70 mA	@ 24 V DC unloaded
Output signals			A, B	quadrature signal
			A, /A, B, /B, options: I, /I, or R, /R	
Sensor / magnetic strip gap			0.1–1.0 mm, reference signal R 0.1-0.4 mm	lateral offset ± 2 mm, @ reference signale R ± 0.5 mm
System accuracy			± (0.05 + 0.01 x L) mm, L in m	repeat accuracy ± 1 increment, at T_U = 20 °C
Jitter			< 15%	for sensor / magnetic strip gap 0.5 mm
Travel sped			max. 25 m/s	max. referencing speed 2 m/s
Interference protection class			3, according to IEC 801	humidity: 100 % rH, condensation permitted
Temperature ranges			working temperature: -10° ... +70 °C	storage temperature: -30 ... +80 °C
Type of protection			IP67 acc. to DIN 40050 (housing)	CE test mark
Housing			A - plastic, green	
Cable			PUR	

Your order: MSK210 – [A] – [B] – [C] – [D] – [E] – [F] – [G]

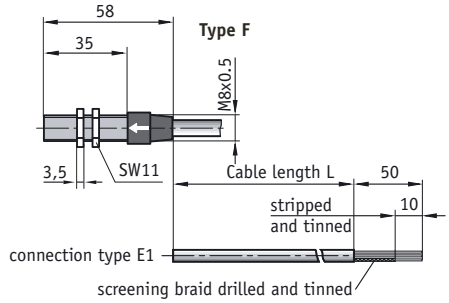
Magnetic Sensor MSK320

As a component of a magnetically operating, open and robust measuring system, this sensor with integrated translation module has a direct digital signal output. Used in combination with the MB320 magnetic strip, this sensor forms an open, robust and linear measuring system.





Sensor / Strip assignment for R reference signal



Features:

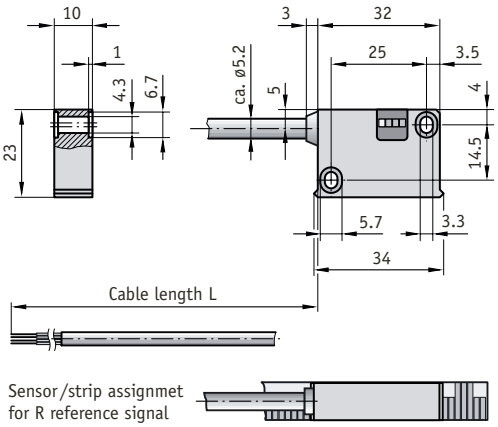
- insensitive to dust, shavings, humidity
- IP67 type of protection
- max. resolution 0.04 mm
- real-time data processing
- fixed reference point

Feature	Ordering data		Technical data	Additional information
Operating voltage	**4**	A	**24 V DC ± 20 %**	**standard, with polarity protection**
	5		5 V DC ± 5 %	
Design	**A**	B	**rectangular**	**standard**
	F		round design	
Connection / cable length	**E1/2.0**	C	**flying lead, 2 m cable**	**standard** (max. 20 m cable length)
	E6, E8		E6, circular plug	E8, D-SUB 9-pin
Output circuit	**PP**	D	**push-pull**	**standard**, only operating voltage 4
	LD		line driver	
	TTL			only for non-inverted output signal, cable length max. 5.0 m
Output signal	**NI**	E	**not inverted**	**standard**
	I		inverted	standard with reference signal I or R
Reference signal	**0**	F	**without**	**standard**
	I		periodic index	
	R		fixed index	not possible for resolution 0.8 mm
Resolution	**0.1**	G	**0.1 mm**	**standard**, options 0.05/0.2/0.8/0.04/0.08/0.16
				F design only possible with 0.1/0.2 resolution
Power consumption			max. 70 mA	@ 24 V DC unloaded
Output signals			A, B	quadrature signal
			A, /A, B, /B, options: I, /I, or R, /R	only A design, quadraturesignal
Sensor / magnetic strip gap			0.1–2.0 mm, reference signal R 0.1-1.5 mm	lateral offset ± 2 mm, @ reference signal R ± 0.5 mm
System accuracy			± (0.1 + 0.01 x L) mm, L in m	repeat accuracy ± 1 increment, at T_u = 20 °C
Jitter			< 15%	with 0.5 mm sensor/magnetic strip gap
Travel speed			max. 25 m/s	max. referencing speed 3.2 m/s
Interference protection class			3, according to IEC 801	humidity: 100 % rH, condensation permitted
Temperature ranges			working temperature: -10° ... +70 °C	storage temperature: : -30 ... +80 °C
Type of protection			IP67 acc. to DIN 40050 (housing)	CE test mark
Housing			rectangular housing, plastic, red	round steel housing
Cable			PUR	

Your order: MSK320 – [A] – [B] – [C] – [D] – [E] – [F] – [G]

Magnetic Sensor MSK5000

Contactless measuring sensor unit with integrated translation module and digital signal output. In combination with the magnetic band MB500, the sensor forms an open, robust and linear measuring system with high resolution at a reading distance of 2,0 mm.



Features:

- Resolution up to 0,001mm
- Free programmable parameters (e.g. resolution) via optical interface
- Status LEDs
- Real-time data processing
- Scale MB500 (linear) / MR500 (radial)
- Fix and periodical reference signals

Resolution [mm]	travel speed Vmax. [m/s]								
0.001	0.01	0.03	0.05	0.10	0.20	0.32	0.80	1.60	4.00
0.005	0.06	0.13	0.25	0.50	1.00	1.60	4.00	8.00	20.00
0.010	0.12	0.25	0.50	1.00	2.00	3.20	8.00	16.00	25.00
0.025	0.30	0.63	1.25	2.50	5.00	8.00	20.00	25.00	25.00
0.050	0.61	1.25	2.50	5.00	10.00	16.00	25.00	25.00	25.00
0.100	1.21	2.50	5.00	10.00	20.00	25.00	25.00	25.00	25.00
Puls interval [µs]	66.00	32.00	16.00	8.00	4.00	2.50	1.00	0.50	0.20
Counter frequenz [kHz]	3.79	7.81	15.63	31.25	62.50	100.00	250.00	500.00	1250.00

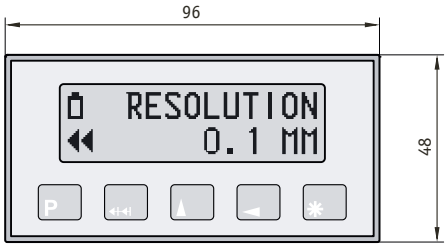
Feature	Ordering data		Technical data	Additional information
Operating voltage	**10**	A	**6.5 ... 30 V DC ± 20 %**	**standard, with polarity protection**
	11		4.75 ... 6 V DC ± 5 %	
Type of connection/cable length	**E1/1.0**	B	**stripped lead, 1 m cable**	**standard** (max. 20 m cable length)
	.../...		E6, circular plug	E8, D-SUB 9-pin
Output circuit	**PP**	C	**push-pull**	**standard**, only operating voltage 10
	LD		line driver	RS422
Reference signal	**0**	D	**without**	**standard**
	I		index periodic	1 increment
	R		index fixed	1 increment
Resolution	**0.005**	E	**0.005 mm**	**standard**, option 0.001/0.01/0.025/0.05/0.1
Pulse interval	**1**	F	**1 µs**	**standard**, option 0.2/0.5/2.5/4/8/16/32/66
Power consumption			<25 mA	unloaded
Output signals			A, /A, B, /B, option: I, /I or R, /R	quadrature signal
LED status signals			A, B, I or R, power	
Gap sensor / magnetic strip			0.1–2.0 mm, reference signal R 0.1-1.5 mm	lateral offset ± 2 mm, with reference signal R ± 0.5 mm
System accuracy			± (0.025 + 0.01 x L) mm, [L in m]	repeat accuracy max. ±0.01 mm, with T_U = 20 °C
Velocity			depending on resolution and pulse interval	
Temperature ranges			operating temperature: -10 ... +70 °C	storage temperature: -30 ... +80 °C
Interference protection class			3, according to IEC 61000	humidity: 100 % rF, condensation permitted contact surface
Type of protection			IP67 acc. to DIN 40050 (housing)	test mark CE
Housing			ABS (black plastic)	encapsulating material Henkel Macromelt
Cable			PUR	max. 20 m cable length

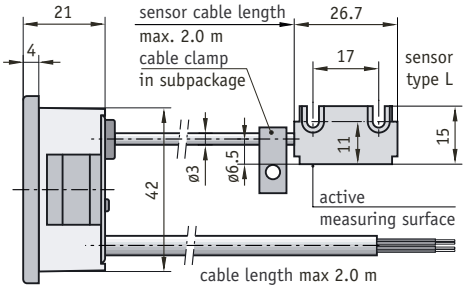
Note: The internal translation module can generate fast counting pulses, the lengths of which are limited by the pulse interval. The follower electronics must be adjusted accordingly. Select the pulse interval in advance, if necessary.

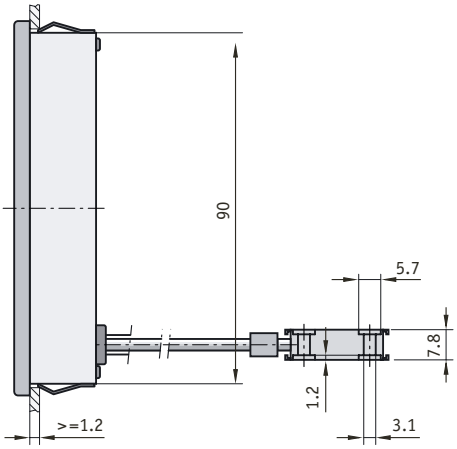
Your order: MSK5000 – [A] – [B] – [C] – [D] – [E] – [F]

Magnetic Display MA501

The magnetic display MA501 is a novel, multi-functional axis display with hard-wired sensor for use in combination with the magnetic strip MB500 or magnetic rings MR500. Optionally, it has an interface for transferring position data and status messages which makes it particularly suited for target-value specification and actual-value feedback.







Features

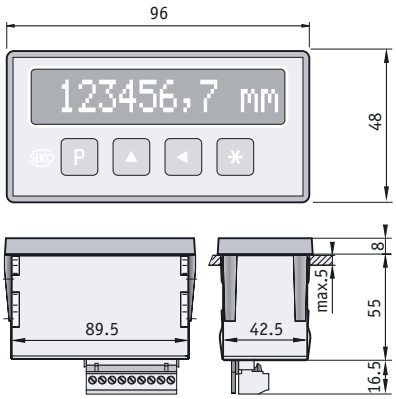
- freely programmable, high-resolution DOT matrix display
- backup function, therefore quasi-absolute, data logging even with currentless adjustment
- display accuracy 10µm
- customer-specific versions
- RS485 interface (option)

Feature	Ordering data		Technical data	Additional information
Design	**EG10**	A	**panel-mount housing**	**standard**, plastic (transparent)
Sensor cable length	...	B	values in m	available up to max. 2.0 m
Data/network cable length	...	C	values in m	available up to max. 2.0 m
Interface/protocol	**XX/XX**	D	**without**	**standard**
	S3/00		RS485 with standard protocol	others on request
Battery holder	**MB**	E	**with**	**standard**, enclosed
	OB		without	
Operating voltage	24 V DC ±20%			
Backup operating voltage			1.5 V DC (1.2 - 1.6 V DC)	
Power consumption			8 mA @ 24 V DC active	<0.1 mA @ 1.5 V DC measuring system active, display off
Magnetic sensor			rectangle with elongated hole	
Display/display range			DOT matrix display/ -999 999 ... +999 999	5-keys, membrane keyboard
Interface			RS485 (LAN interface)	
Velocity			max. 5 m/s (of the magnetic sensor)	gap strip/sensor 0.1–2.0 mm
Connection			sensor: mini-DIN	power supply: 9-pin screw-type terminal strip (PMH)
Resolution			max. 10 µm	
Repeat accuracy			± 1 increment	
System accuracy			± (0.1 + 0.01 x L)mm [L in m]	for T_U = 20 °C
Interfer. protect. class, test mark			3 according tob IEC 801	CE
Signal input			reference switch	
Temperature range			operating temperature: 0 ... +70 °C	storage temperature: -30 ... +80 °C
Type of protection			IP54 front	IP67 sensor
Humidity			max. 95 % rH	condensation not permitted
Weight			approx. 70 g	

Your order: MA501 – [A] – 4 – L – [B] – [C] – [D] – S – [E]

Magnetic Display MA502

This display serves to interpret information from the incremental MS500 magnetic sensor for distance and angle measurement. The display parameters are comprehensive and individually programmable. Optionally equipped with serial interface and integrated power unit.



Features

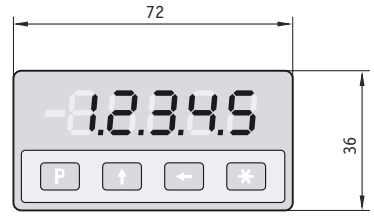
- high-contrast 12-digit LCD, dot matrix
- integrated translation module for length and angle measurement
- incremental/reset function
- input for reference switch
- programmable last value memory
- direct input of reference/offset value
- option: 2 measuring channels

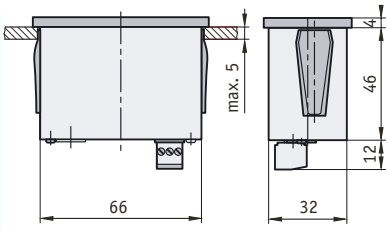
Feature	Ordering data		Technical data	Additional information
Design	**EG**	A	**panel-mount housing,** cutout 92 x 45 mm	**standard,** Noryl GFN 2 SE 1, as snap-in module
	TG		bench-top housing	aluminium profile, black anodized
Operating voltage	**4**	B	**24 V DC** ±20%	**standard**
	1		230 V AC ±10%	
	2		115 V AC ±10%	
Reference connection	**RM**	C	with connection	**standard**
	RO		without (only bench-top housing)	
Interface / protocol	**XX/XX**	D	**without**	**standard**
	S1/00		RS232 with standard protocol	others on request
Switching output	**SO**	E	**without**	**standard**
	SM		with	only for XX/XX interface
Input	**1**	F	**one channel**	**standard**
	2		two channels	
Software	**S**	G		**standard**
	SW01		for two channels	
Magnetic sensor			MS500	incremental
Display / display range			12-digit LCD dot matrix	-9 999 999 … 9 999 999 + sign + units
Connection			sensor: Mini-DIN	supply: 9-pin screwed terminal strip (EG)
Travel speed			max. 5 m/s (of the magnetic sensor)	with 0.1–2.0 mm strip/ sensor gap
Resolution			in mm 0.01/0.1/1/10	in inch 0.001/0.01/0.1/1, angles 0°–90°–0° / 0°–360°
Repeat accuracy			± 1 digit	
System accuracy			± (0.05 + 0.01 x L)mm [L in m]	at T_U = 20 °C
Protection class, test mark			3 according to IEC 801	CE
Signal input			reference switch	
Temperature range			working temperature: 0 … +50 °C	storage temperature: -20 … +80 °C
Type of protection			IP 40 acc. to DIN 40050 for whole unit	IP 60 acc. to DIN 40050 for control panel inclusion
Humidity			95 % rH	condensation not permitted

Your order: MA502 – [A] – [B] – [C] – [D] – [E] – [F] – [G]

Magnetic Display MA506

With this particularly kompact magnetic display information from the connected MS500 sensor is interpreted for position and angle measurement. The display has a broad range of individual adjustment possibilities.





Features:

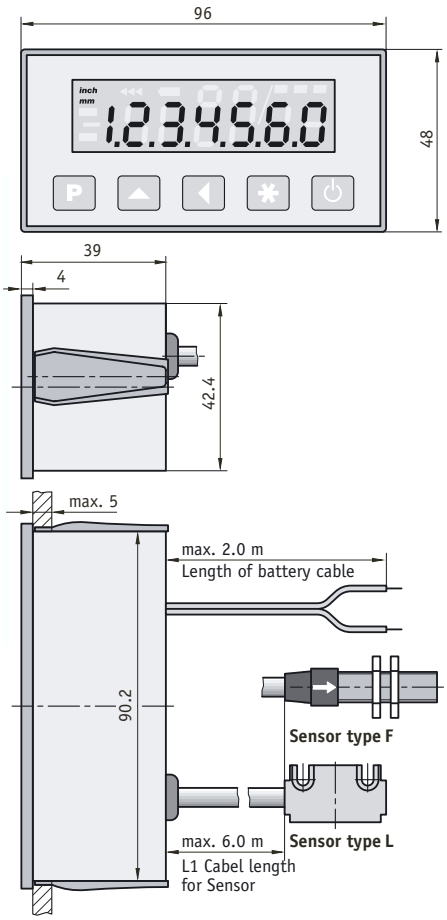
- integrated translation module
- programmable parameters
- incremental function
- programmable last value memory
- direct input of reference/offset value
- reference input

Feature	Ordering data		Technical data	Additional information
Design	**EG**	A	**panel-mount housing,** cutout 68 x 33 mm	**standard,** plastic, red transparent, snap-in module
	TGL		bench-top housing	aluminium profile, black anodized
Operating voltage	**4**	B	**24 V DC** ±20 %	**standard**
	1		230 V AC -10/+6 %	only with TGL
Sensor connection	**S**	C	**pluggable**	**standard,** delivery without MS500 sensor
	M		permanently attached	
Magnetic sensor type	**OS**	D	**without sensor**	**standard,** only for "S" sensor connection
	L		L design	
	F		F design	
Sensor cable length	**2.0**	E	0.1 ... 20.0 m	**standard**
(only for "M" sensor connection)				
Power consumption			< 60 mA	@ 24 V DC
Display/display range			5-digit LED, red, 10 mm	-99 999 ... (+)99 999
Connection			sensor: Mini-DIN	supply: 3-pin terminal strip
Travel speed			max. 5 m/s (of magnetic sensor)	for 0.1–2.0 mm strip/ sensor gap
Resolution			in mm 0.01/0.05/0.1/1	in inch 0.001/0.01/programmable angle display
Repeat accuracy			± 1 digit	
System accuracy			± (0.1 + 0.01 x L) mm, L in m	at T_U = 20 °C
Protection class, test mark			3 according to IEC 801	CE
Temperature range			working temperature: -10 ... +70 °C	storage temperature: -30 ... +80 °C
Type of protection			IP 40 acc. to DIN 40050 for whole unit	IP 60 acc. to DIN 40050 for control panel inclusion
Humidity			max. 95 % rH	condensation not permitted

Your order: MA506 – [A] – [B] – [C] – [D] – [E]

Magnetic Display MA503/1

Battery-powered, quasi-absolute magnetic display for direct position information, e.g. on limit stop systems. This concept offers to the customer high flexibility through easy integration.



Features:

- low-power LCD with decimal and inch fraction function
- strip/sensor gap up to 2.0 mm
- battery-powered (e.g., LR14 type)
- quasi-absolute by battery-buffered memory
- 10 µm decimal display accuracy
- 1/16 inch display accuracy

Option

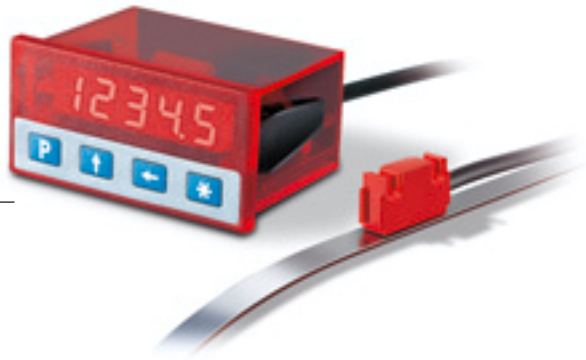
- customer-specific versions

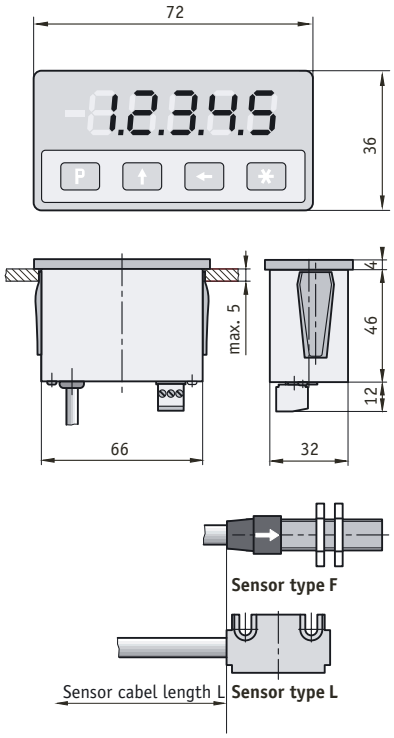
Feature	Ordering data		Technical data	Additional information
Housing	**EG40**	A	panel-mount housing, depth approx. 40mm	**standard**, see drawing
	EG40H			see appendix
	EG10			see appendix
	ES		installation kit	see appendix
	TF			see appendix
Operating voltage	7	B	3.0 V DC	
	8		1.5 V DC	only with ES and TF designs
Sensor design	**L**	C	**rectangle with elongated hole**	**standard**
	F		round design	
Sensor cable length	0.3	D	in meter	available up to max. 2 m
Supply cable length	0.3	E	in meter	available up to max. 2 m
Battery compartment	**M**	F	**with**	**standard**
	0		without	
	I		integrated	only for EG40 with operating voltage 7
Power consumption			approx. 400 µA	with battery monitoring
Sensor / magnetic strip gap			max. 2 mm	
Display			LCD, approx height 12.5 mm	decimal up to 10 µm, inch fractions up to 1/16 inch
Operator controls			5 keys, membrane keyboard	with ON/OFF function
Test mark			CE	
Travel speed			max. 5 m/s	
Resolution			max. 10 µm, programmable	
System accuracy			± (0.1 + 0.01 x L) mm, L in m	at T_U = 20 °C
Repeat accuracy			± 1 digit	
Working temperature			0° ... +60°C	

Your order: MA503/1 – [A] – [B] – [C] – [D] – [E] – [F]

Magnetic Display MA562

The lowest-power technology enables the MA562 to be used as a low-cost quasi-absolute system over a period of approx. 10 years - currentless adjustments are, therefore, logged.





Features:

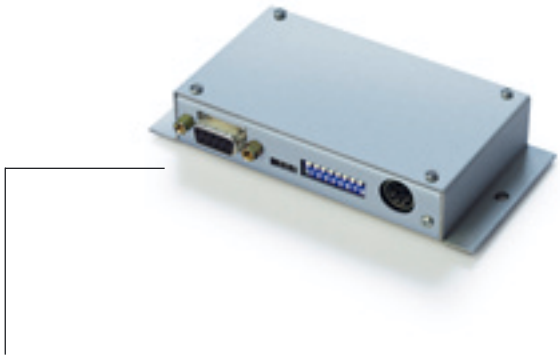
- 5-digit LED with minus sign
- backup battery (approx. 10 yearsof working life), thus quasi-absolute
- hard-wire sensor

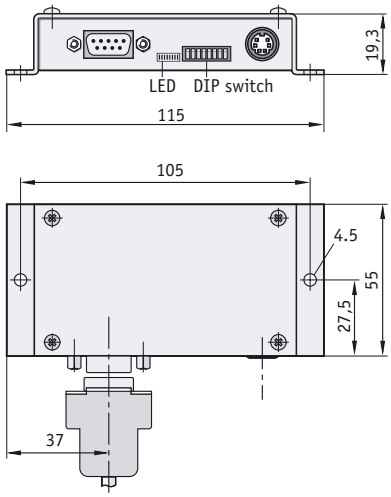
Feature	Ordering data		Technical data	Additional information
Design	**EG**	A	**panel-mount housing**	**standard**
Operating voltage	**4**	B	**24 V DC ±20 %**	**standard**
Bauform Sensor	**L**	C	**rectangle with elongated hole**	**standard**
	F		round design	
Sensor cable length	...	D	values in m	
Backup	**i**	E	**internal**	**standard**
	e		external	
Interface/protocol	**XX/XX**	F	**without**	**standard**
	S3/00		RS485/ASCII-protocol	
Software	**S**	G	**standard-software**	**standard**
Power consumption			max. 60 mA : 24 V DC	
Power consumption backup			<30 µA : 3 V DC	lithium 2200 mAh
Sensor/magnetic strip gap			max. 2mm	
Display range			-99 999 ... 99 999	
Operator controls			4 keys, membrane keyboard	
Test mark, protection class			CE, Protection class 3 acco. to IEC 801	
Travel speed			max. 5 m/s	
Resolution			max. 10 µm	
System accuracy			± (0.1 + 0.01 x L) mm, L in m	T_U = 20 °C
Repeat accuracy			± 1 Digit	
Temperature range			operating temperature -10° ... +70°C	Storage temperature -30° ... +80°C
Humidity			max. 95 % rH	condensation not permitted

Your order: MA562 – [A] – [B] – [C] – [D] – [E] – [F] – [G]

Translation Module AS510/1

High-resolution electronics for connecting the pluggable MS500 magnetic sensor. The AS510/1 provides digital quadrature signals with resolutions up to 5 µm after 4x pulse multiplication in the follower electronics.





Features:

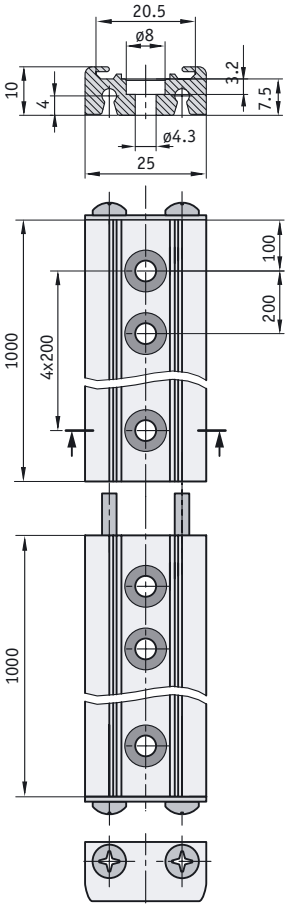
- parameters can be set via DIP switches
- resolutions of up to 5 µm (digital)
- real-time data processing
- MB500 magnetic strip
- reference signal in 5 mm intervals
- system accuracy up to 50 µm

Feature	Ordering data A	Technical data	Additional information
Operating voltage	**4**	**24 V DC ± 20 %**	**standard, with polarity protection**
	5	5 V DC ± 5 %	without polarity protection
Power consumption		< 70 mA	
Output signals		quadrature A, B, 0	each inverted
Connection		D-SUB 9-pin	
Output circuit		PP, LD (RS422)	DIP switch-selectable
Electrical connection		pluggable sensor	Mini-DIN connector
		D-SUB 9-pin for power supply and signal output	
Lead cable length		max. 50 m	according to RS422 specification
Housing		steel sheet	electrogalvanized
Interference protection class		3 according to IEC 801	
Resolution		5 µm, 10 µm, 20 µm, 25 µm, 50 µm, 100 µm	after 4x pulse multiplication
Travel speed		max. 20 m/s (of magnetic sensor)	selectable via internal DIP switch
Sensor / magnetic strip gap		max 2.0 mm	over whole measuring length
System accuracy		± (0.025 + 0.01 x L) mm, L in m	at T_U = 20 °C (with MB500 and 0.05 mm precision class)
Repeat accuracy		± 1 increment	
Temperature range		working temperature: 0 ... +70 °C	storage temperature: -20 ... +70 °C
Humidity		max. 95 % rH	condensation not permitted
Type of protection		IP 40 according to DIN VDE 0470	CE test mark
Weight		approx. 400 g	overall weight

Your order: AS510/1 – [ ] (A)

Profile Rail PS, Protective Strip SB

Complete and robust mounting unit for 10 mm wide magnetic strips. For extremely demanding applications, the pushed-in protective strip gives additional protection.



Features:

- easy mounting
- no glueing connections
- ideal to insert magnetic band
- plug-in modules allow easy extension

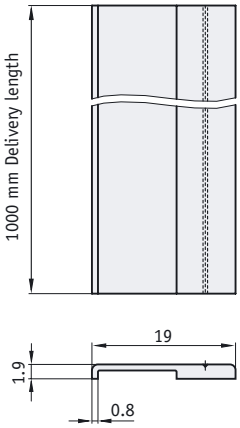
Feature	Ordering data		Technical data	Additional information
Profile rail	**PS**			complete with couple pins and closing panel
Length	**1.0**	A	**1.0 m**	**standard**
	...		length in meter	0.3 ... 10 m (in steps of 0.1)
Width x height			25 x 10 mm	
Material			aluminium	
SB Protective strip	**20**	A	width 20 mm	options: 5/9/10 mm wide
Length	**1.0**	B	**1.0 m**	**standard**
	...		length in meter	required length = profile rail + 36 mm
Adhesive tape	**without**	C		not required in combination with PS
	with			
Material			stainless steel	

Your order: [ ] – [ ] (A) – [ ] (B) – [ ] (C)

Accessory

Profile Rail PS1

Continuous cast profile to safely cover magnetic strips with a width of up to 10 mm.



Features:

- easy mounting
- for strong protection of magnetic strips

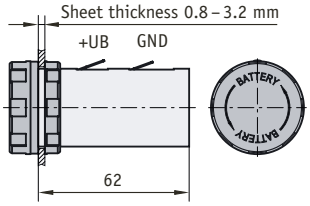
Feature	Ordering data	Technical data	Additional information
Length	**1.0** A	**1.0 m**	**standard**
	...	length in meter	
Material		aluminium	
Mounting type		screwed	with slot for easy drilling

Your order: PS1 – [ ] A

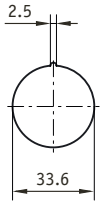
Appendix / other versions

MA501

Battery holder

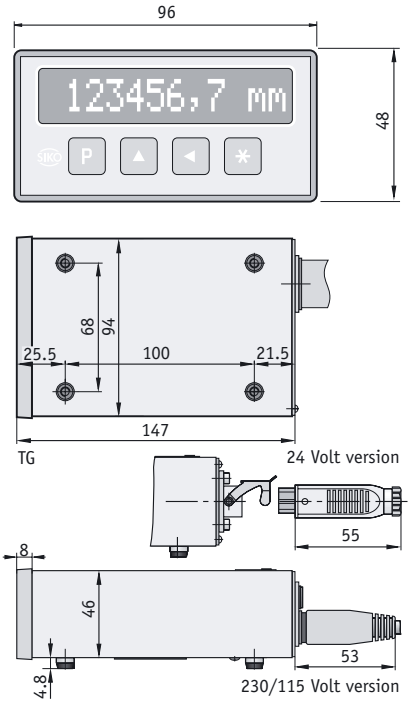


Mounting bore



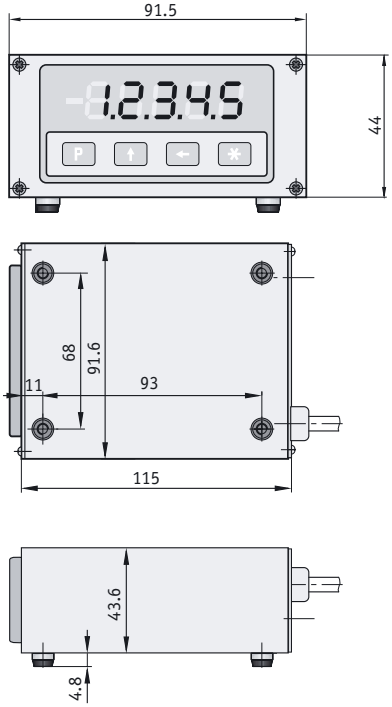
MA502

TG bench-top housing



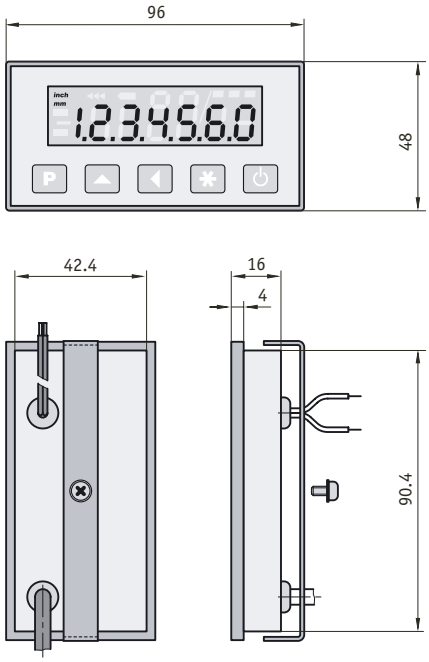
MA506

TGL bench-top housing

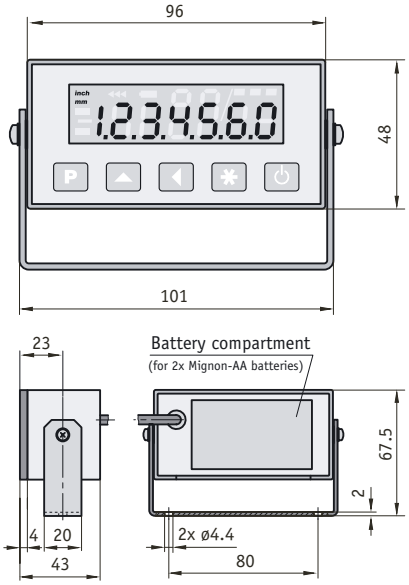


Appendix / other versions

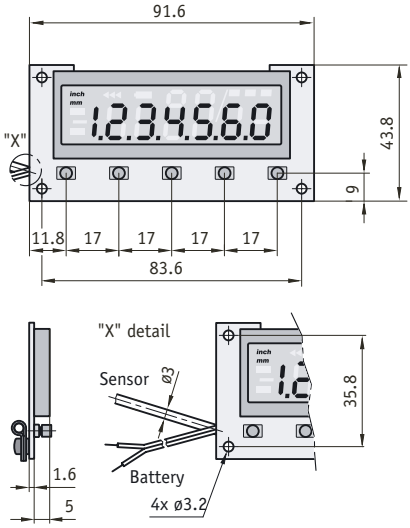
MA503/1
EG10 panel-mount housing



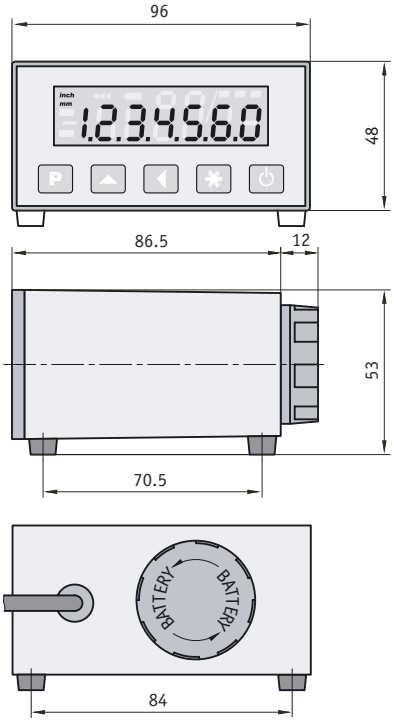
MA503/1
EG40H panel-mount housing



MA503/1
ES installation kit



MA503/1
TF bench-top housing



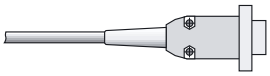
Appendix/ Pin-outs 1

MSK200/1, MSK210, MSK320, MSK500/1

E1 connection type
flying leads

E6 connection type
circular plug

E8 connection type
9-pin D-SUB connector



E1 **E6** **E8**

Without inverted signals (only MSK210 and MSK320)

Colour	PIN	PIN	Signal
black	1	1	GND
brown	2	2	+UB
red	3	3	A
orange	4	4	B

With inverted signals

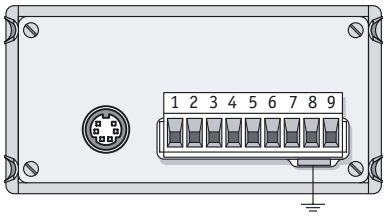
Colour	PIN	PIN	Signal
red	1	1	A
orange	2	2	B
blue	3	3	N.C.
brown	4	4	+UB
black	5	5	GND
yellow	6	6	A/
green	7	7	B/

With inverted signals and reference signal

Colour	PIN	PIN	Signal
red	1 (A)	1	A
orange	2 (B)	2	B
blue	3 (C)	3	I
brown	4 (D)	4	+UB
black	5 (E)	5	GND
yellow		6 (F)	6 A/
green	7 (G)	7	B/
violet	8 (H)	8	I/

MA502

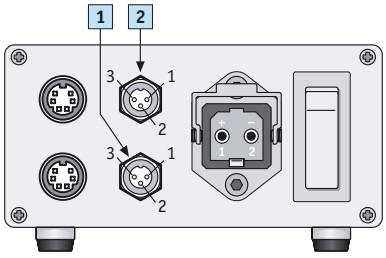
Panel-mount housing



PIN	Terminal strip connections
1	reference input
2	UB = +12 V
3	GND
4	N.C.
5	RS232 RXD interface
6	RS232 TXD interface
7	PE
8	N (230/115 VAC), GND (24 VDC)
9	L (230/115 VAC), UB (24 VDC)

MA502

Bench-top housing
24 V DC

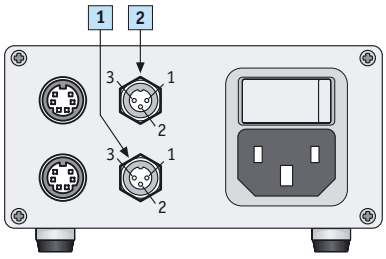


1	PIN	Reference switch connections
	1	RFS
	2	GND
	3	+UB

2	PIN	Interface connections
	1	GND
	2	RXD
	3	TXD

MA502

Bench-top housing
230 V AC



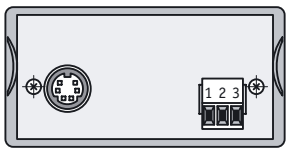
1	PIN	Reference switch connections
	1	RFS
	2	GND
	3	+UB

2	PIN	Interface connections
	1	GND
	2	RXD
	3	TXD

Appendix/ Pin-outs 2

MA506

EG panel-mount housing
24 V DC



	Name	Connection
	+	+UB = 10 ... 30 V DC
	–	GND
	CAL	Reset

MA506

TGL bench-top housing
24 V DC

	Pin	Terminal strip connections
	1	reference input
	2	+UB = 10 ... 30 V DC
	3	GND

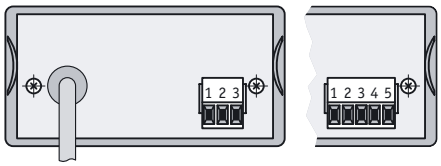
MA506

TGL bench-top housing
230 V AC

Safety plug

MA562

EG panel-mount housing
24 V DC



without Interface

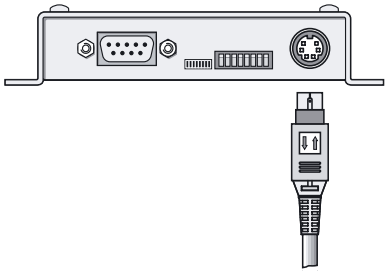
	Pin	Internal backup	External backup
	1	N.C.	External backup
	2	+UB	+UB
	3	GND	GND

with Interface

	Pin	Internal backup	External backup
	1	A	A
	2	B	B
	1	N.C.	External backup
	2	+UB	+UB
	3	GND	GND

AS510/1

D-SUB connector



	Pin	D-SUB connections
	1	A
	2	A/
	3	GND (for output signals)
	4	B
	5	B/
	6	0/
	7	0
	8	+ UB
	9	GND (for power supply)

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