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Resolution
0.1 mm

Linear Encoder

POMUX®

KH 53: Absolute Linear Encoders. Wear-free for rough environmental conditions

The POMUX KH 53 absolute linear encoder functions on the transmitter/receiver principle. Because of the absolute position detection, an initialising reference run is not necessary.

The measuring method: A read head determines without contact, the absolute position of a series of scale sections, which are mounted along the measurement section.
The read head consists of a series of magnetoresistive sensors, which can always detect the position of at least 3 permanent magnets to determine the absolute position.

The scale sections are manufactured from aluminium and are referred to as measuring elements: These are mounted in a row at fixed intervals with the aid of a mounting gauge until the desired measuring length is reached. Fitted within each measuring element are permanent magnets, whose spacing from one another represents the unique encoding of a portion of the measurement section. The read head moves parallel to these measuring elements. The separation of read head and measuring element is 25 mm.

With a measuring length of up to 1.700 m, the KH 53 is particularly suitable for use in cranes, in storage and conveyor engineering and on rail-bound vehicles. As a result of the non-contact principle of operation, this system operates without wear even under the harshest environmental conditions.

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◄ In a high-bay warehouse, the co-ordinates MUST be correct in order to ensure smooth operation. With KH 53 Linear Encoders, they are correct to a tenth of a millimetre.

▼ Pinpoint positioning, even over long distances: in fully and partially automated loading stations, Linear Encoders – quite literally – are the measure of all things.

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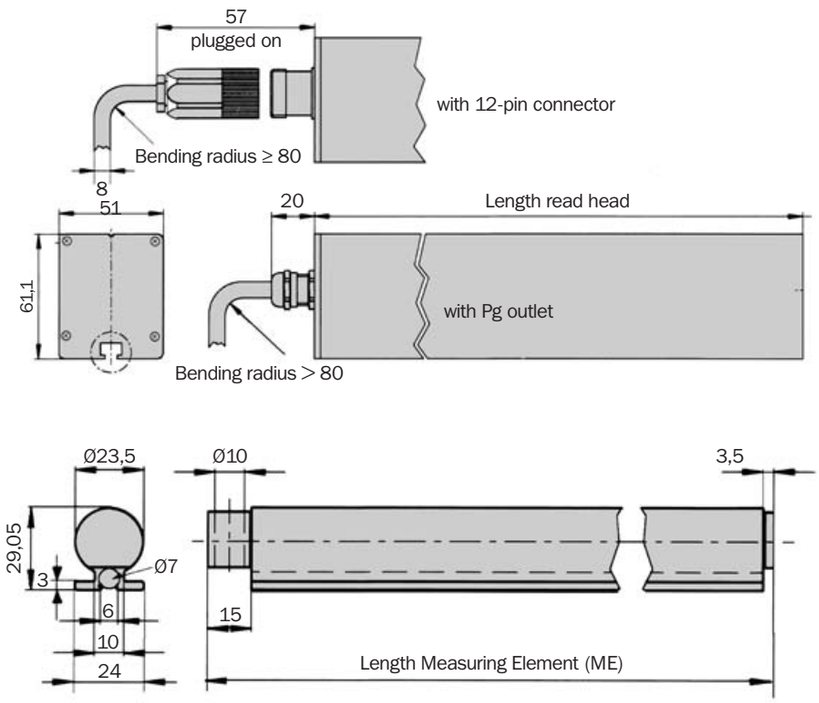
Resolution 0.1 mm

Linear Encoder

- Measuring length up to 1.7 km
- Non-contact length measuring system, wear free
- Absolute position measurement no initialising reference run
- Choice of electrical interfaces
- Position sampling time independent of length
- Degree of protection up to IP 66

CE

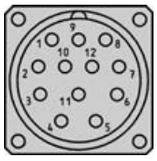
Dimensional drawing Linear Encoder KH 53 SSI



PIN and wire allocation SSI Interface [1)]

PIN	Signal	Colour of wires (cable outlet)	Explanation
1	GND	blue	Earth (ground) connection
2	data +	white	Interface signal
3	clock +	yellow	Interface signal
4	R x D +	grey	RS 422 Programming lines
5	R x D –	green	RS 422 Programming lines
6	T x D +	pink	RS 422 Programming lines
7	T x D –	black	RS 422 Programming lines
8	+ U_s	red	Supply voltage
9	N. C.	orange	Not connected
10	data –	brown	Interface signal
11	clock –	violet	Interface signal
12	N. C.	–	Not connected

See chapter Accessories
Accessories for encoders



View of the connector M23 fitted to the encoder body SSI

[1)] **Other Interfaces on request**

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Technical data		KH 53 SSI
System resolution		0.1 mm
Reproducibility		0.3 mm
Measurement accuracy [1]		± 1000 + ME (Tu-25° C) Tk µm
Coefficient of thermal expansion Tk		28 µm/°C/m
Mass		
Read head	38	2.4 kg
	107	2.7 kg
	354	3.6 kg
	1700	5.2 kg
Measuring element		0.5 kg/m
Material		
Read head		AlMgSiPbF28
Measuring element		AlMgSi0,5F22
Resistance to shocks [2]		
Read head		30/10 g/ms
Measuring element		50/10 g/ms
Resistance to vibration [3]		
Read head		10/20 … 250 g/Hz
Measuring element		30/20 … 250 g/Hz
Working temperature range		– 20° … + 60 °C
Storage temperature range		
Read head		– 40° … + 85 °C
Protection class acc. IEC 60529		
Read head with srew-in system		IP 65
Read head with cable		IP 66
Max. movement speed [4]		6.6 m/s
Initialisation time		2 s
Position forming time		0.8 ms
Supply voltage		10 … 32 V
Operating current SSI		120 mA
Interface for parameterising		
Four wire transmission, asynchrony, full duplex		
Data format: 1 start bit, 8 data bits, 1 stop bit, no parity		
Data protocol: ASCII, Baud rate 9600		RS 422
Interface digital, serial		SSI 24 bits format
Standart (Default setting SSI standard)		RS 422 off

[1] If the read head and measuring element are mounted within ± 1 mm of the nominal mounting distance in the N and Y directions.
The figures quoted related to the accuracy within a measuring element with reference to the start of that measuring element.
ME = length (x)
Tu = Ambient temperature °C

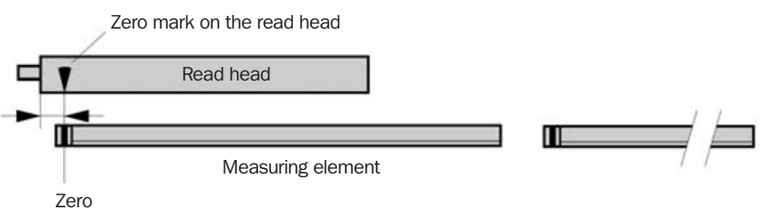
[2] According DIN EN 61000-2-27 the shock resistance can be considerably increased in special variants.

[3] According DIN EN 61000-2-6 the vibration resistance can be considerably increased in special variants.

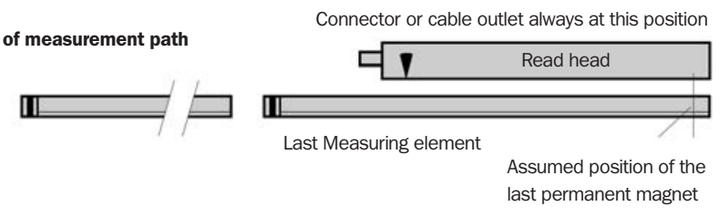
[4] If the max. movement speed is exceeded or the read head cannot detect a measuring element the error message FF FF FE Hex is produced.

Position tolerances

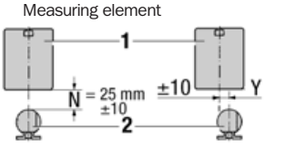
Start of measuring path



End of measurement path



1 Read head
2 Measuring element



The reliability and accuracy of the measuring system are dependent upon maintaining the mounting tolerances! Any magnetic material should be at least of 80 mm from the measuring elements.

Order information see page 115

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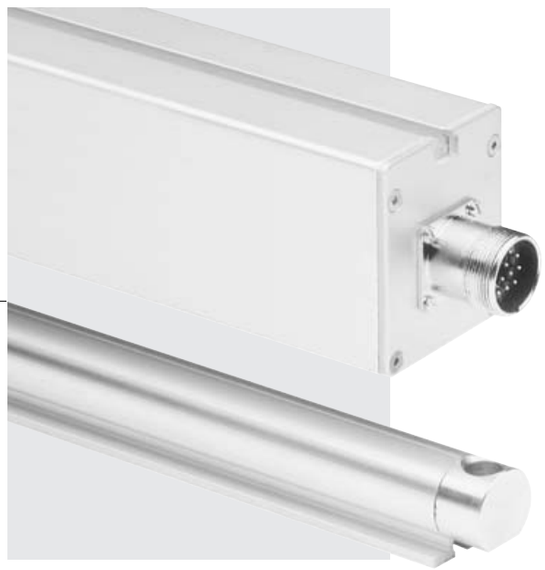
Resolution 0.1 mm

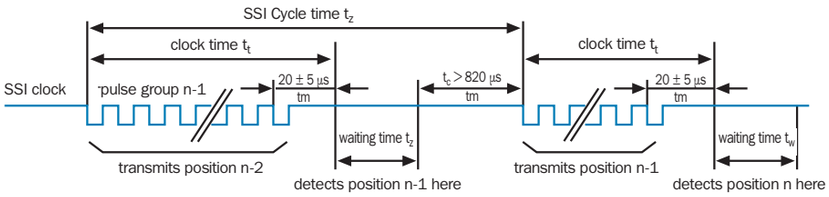
Linear Encoder

- Measuring length up to 1.7 km
- Non-contact length measuring system, wear free
- Absolute position measurement no initialising reference run
- Choice of electrical interfaces
- Position sampling time independent of length
- Degree of protection up to IP 66



CE

Interface description



tm = Monoflop time
tc = Read head scanning interval with deactivated asynchronous interface (Default).

A number of special features must be observed for use of this interface in POMUX KH 53 :

Standard operation

The digital angle information cannot be read directly from a coding disc but is formed by complex computation algorithm from a number of analog voltages, it is not possible to detect the position value associated with this time when first trailing edge of the clock signal occurs.

During standard operation, the KH 53 forms a position value cyclically every 800 µs irrespective of the SSI read cycle, and places this value in the output register provided for this purpuse, for recovery by the interface. Since the SSI read cycle and the position forming cycle can never be the same, this results in a continuous shift in the time position assignment.

In other words:
The time assignment of the position value fluctuates from 5 µs to 800 µs in this operating mode.

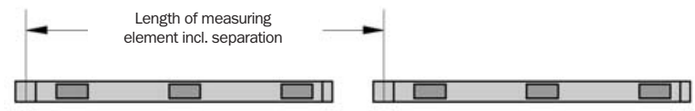
Synchronous SSI-Operation

The synchronous SSI operating mode can be connected via the parametrising interface in order to avoid the fluctuation of the time position assignment, which can lead to highly unpredictable behaviour of the control loop.
In this operating mode, position detection is started on the first trailing edge of the SSI pulse, and the position is detected using the last pulse group.
In order to keep the delay time of between position measurement and position transmission as short as possible, the position measurement can be delayed by parameterising a waiting time. This ensures that the current position is measured as shortly as possible before the SSI clock group.

The waiting time t_w must be less than the SSi cycle time t_z minus the clock time t_t minus 820 µs.

Waiting time condition
$t_w < t_z - t_t - t_c$
$t_c = 820$ µs

Order information



Measuring length	Read head length	Length of measuring element incl. separation	Mounting equipment per measuring element (proposed)
up to 38 m	0.87 m	2.30 m Ident. A1 … AN	4 Spacer supports or 8 Fastening clamps
up to 107 m	1.05 m	1.87 m Ident. B1 … BN	3 Spacer supports or 6 Fastening clamps
up to 354 m	1.38 m	2.50 m Ident. C1 … CN	4 Spacer supports or 8 Fastening clamps
up to 1700 m	2.03 m	1.90 m Ident. D1 … DN	3 Spacer supports or 6 Fastening clamps

See chapter Accessories
Accessories for encoders

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Order information

Calculation example for a measuring length of 100 m

Choose the system with a max. measuring length of 107 m

$$\text{Number of measuring elements required} = \frac{\text{Desired measuring length}}{\text{Length of measuring element (see table above)}}$$

Number of measuring element = 100 m/1.87 m = **53.48**

Ordering quantity is therefore **54** pcs **measuring elements** and **54 * 3 = 162 spacer supports**

If **two separate measuring lengths** are required, then please order as **2 x 54** measuring elements (**not 108** measuring elements)

Length measuring systems

Length measuring system KH 53 - absolute, linear; measuring length up to 38 Meter

Type	Part no.	Measuring element length
KHK53-AXR00038	1 030 048	Read head 38, SSI, cable 1.5 m
KHK53-AXS00038	1 030 049	Read head 38, SSI, cable 3.0 m
KHK53-AXT00038	1 030 050	Read head 38, SSI, cable 5.0 m
KHK53-AXU00038	1 030 051	Read head 38, SSI, cable 10.0 m
KHK53-AXB00038	1 030 052	Read head 38, SSI, connector M23, 12 pin
KHT53-XXX00038	1 030 055	Measuring element up to 38 m, coded
KHU53-XXX00038	1 030 056	Measuring element up to 38 m, universal, configurable [1]
KHM53-XXX00038	1 030 057	Mounting gauge 38

Length measuring system KH 53 - absolute, linear; measuring length up to 107 Meter

Type	Part no.	Measuring element length
KHK53-AXR00107	1 030 058	Read head 107, SSI, cable 1.5 m
KHK53-AXS00107	1 030 059	Read head 107, SSI, cable 3.0 m
KHK53-AXT00107	1 030 060	Read head 107, SSI, cable 5.0 m
KHK53-AXU00107	1 030 061	Read head 107, SSI, cable 10.0 m
KHK53-AXB00107	1 030 062	Read head 107, SSI, connector M23, 12 pin
KHT53-XXX00107	1 030 065	Measuring element up to 107 m, coded
KHU53-XXX00107	1 030 066	Measuring element up to 107 m, universal, configurable [1]
KHM53-XXX00107	1 030 067	Mounting gauge 107

Length measuring system KH 53 - absolute, linear; measuring length up to 354 Meter

Type	Part no.	Measuring element length
KHK53-AXR00354	1 030 068	Read head 354, SSI, cable 1.5 m
KHK53-AXS00354	1 030 069	Read head 354, SSI, cable 3.0 m
KHK53-AXT00354	1 030 070	Read head 354, SSI, cable 5.0 m
KHK53-AXU00354	1 030 071	Read head 354, SSI, cable 10.0 m
KHK53-AXB00354	1 030 072	Read head 354, SSI, connector M23, 12 pin
KHT53-XXX00354	1 030 075	Measuring element up to 354 m, coded
KHU53-XXX00354	1 030 076	Measuring element up to 354 m, universal, configurable [1]
KHM53-XXX00354	1 030 077	Mounting gauge 354

Length measuring system KH 53 - absolute, linear; measuring length up to 1700 Meter

Type	Part no.	Measuring element length
KHK53-AXR01700	1 030 078	Read head 1700, SSI, cable 1.5 m
KHK53-AXS01700	1 030 079	Read head 1700, SSI, cable 3.0 m
KHK53-AXT01700	1 030 080	Read head 1700, SSI, cable 5.0 m
KHK53-AXU01700	1 030 081	Read head 1700, SSI, cable 10.0 m
KHK53-AXB01700	1 030 082	Read head 1700, SSI, connector M23, 12 pin
KHT53-XXX01700	1 030 085	Measuring element up to 1700 m, coded
KHU53-XXX01700	1 030 086	Measuring element up to 1700 m, universal, configurable [1]
KHM53-XXX01700	1 030 087	Mounting gauge 1700

[1] For temporary replacement of damaged measuring elements

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Resolution 0.1 mm

Linear Encoder

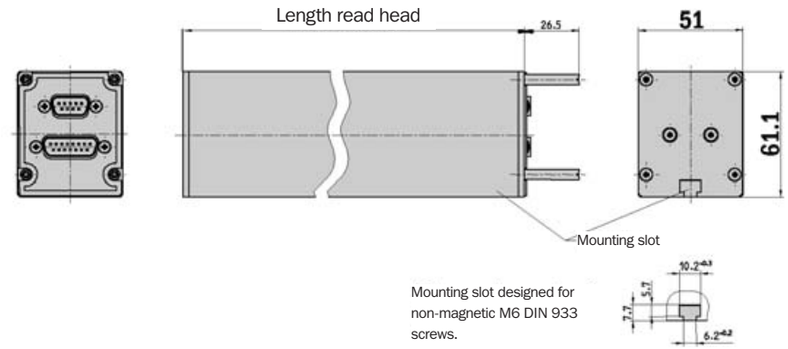
- Measuring length up to 1.7 km
- Non-contact length measuring system, wear free
- Absolute position measurement no initialising reference run
- Choice of electrical interfaces
- Position sampling time independent of length
- Degree of protection up to IP 66

CE

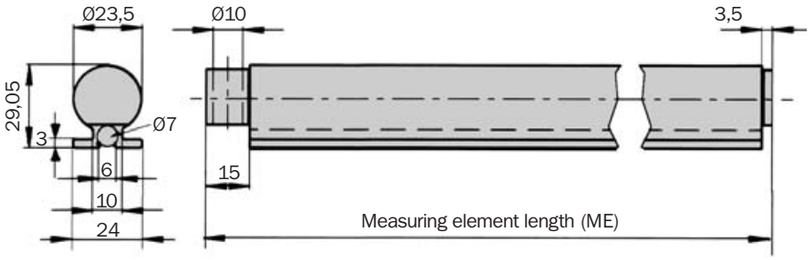
See chapter Accessories

Accessories for encoders

Dimensional drawing read head



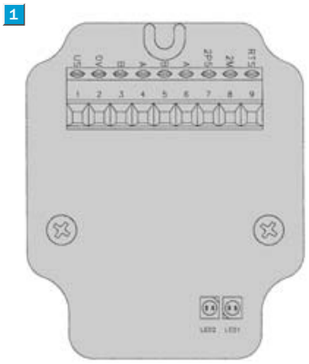
Dimensional drawing measuring element



1 Profibus Adaptor PIN and wire allocation

Terminal strip	Signal	Explanation
1	U_s (24 V)	Supply voltage 10 … 32 V
2	0 V (GND)	Ground (0 V)
3	B	B-cable Profibus DP (out)
4	A	A-cable Profibus DP (out)
5	B	B-cable Profibus DP (in)
6	A	A-cable Profibus DP (in)
7	2P5 1)	+ 5 V (potential free)
8	2M 1)	0 V (potential free)
9	RTS 2)	Request to Send

1



1) For the connection of external bus termination or to supply the transmitter/receiver of a fibre optic data transfer system.

2) This signal is optional for the direction acknowledgement for a fibre optic connection.

1 To connect the wires the connection adapter can be completely removed from the rest of the unit. The diagram alongside shows the terminal allocation.

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Technical Data		KH 53 ProfiBus
System resolution		0.1 mm
Reproducibility		± 0.3 mm
Measurement accuracy [1]		± 1000 + ME (Tu-25° C) Tk µm
Coefficient of thermal expansion Tk		28 µm/°C/m
Mass		
Read head	38	2.4 kg
	107	2.7 kg
	354	3.6 kg
	1700	5.2 kg
Measuring element		0.5 kg/m
Material		
Read head		AlMgSiPbF28
Measuring element		AlMgSi0,5F22
Resistance to shocks [2]		
Read head		30/10 g/ms
Measuring element		50/10 g/ms
Resistance to vibration [3]		
Read head		10/20 … 250 g/Hz
Measuring element		30/20 … 250 g/Hz
Working temperature range		– 20° … + 60 °C
Storage temperature range		– 40° … + 85 °C
Protection class acc. IEC 60529		IP 66
Max. movement speed [4]		6.6 m/s
Initialisation time		2 s
Position forming time		1.1 ms
Supply voltage		10 … 32 V
Operating current		2.0 W
Bus Interface Profibus DP		
Electrical Interface [5]		RS 485
Protocol		Profibus DP basic functions
		Profile for encoders (07hex) – Class 2
Address setting (node number)		0 … 127 (DIP switches or protocol)
Data transmission rate (baud rate)		9.6 kBaud – 12 MBaud
		automatic detection
Electronic adjustment (number SET)		Via Protocol
Status information		Operation (green LED), bus activity(red LED)
Bus termination [6]		Via DIP switches
Electrical connection		Bus connector with screw fixing (x 3)

[1] If the read head and measuring element are mounted within ± 1 mm of the nominal mounting distance in the N and Y directions.
The figures quoted related to the accuracy within a measuring element with reference to the start of that measuring element.
ME = length (x)
Tu = Ambient temperature °C

[2] According DIN EN 61000-2-27 the shock resistance can be considerably increased in special variants.

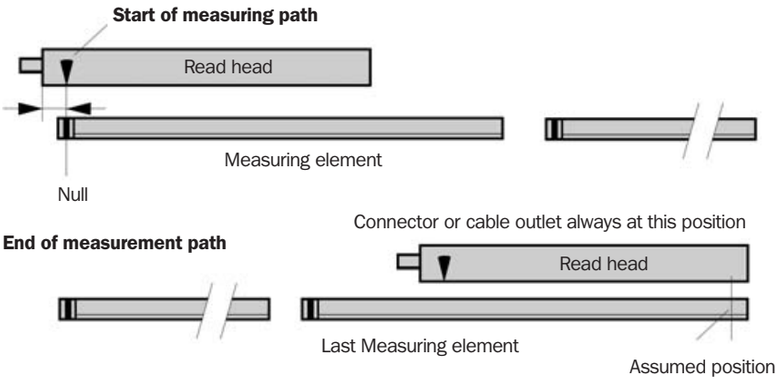
[3] According DIN EN 61000-2-6 the vibration resistance can be considerably increased in special variants.

[4] If the max. movement speed is exceeded or the read head cannot detect a measuring element an error message is produced.

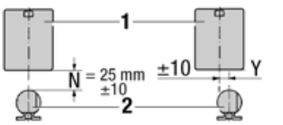
[5] Acc. EN 50 170-2 (DIN 19245 part 1-3) DC isolated via opto-couplers

[6] Should only be connected in the final device.

Position tolerances



1 Read head
2 Measuring element



The reliability and accuracy of the measuring system are dependent upon maintaining the mounting tolerances! Any magnetic material should be at least of 80 mm from the measuring elements.

Order information see page 119

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Implementation

DP Functionalities
In acc. with the Profibus DP basic functions.

DP services
- Data interchange (Write_Read_Data)
- Address allocation (Set_Slave_Address)
- Control commands (Global_Control)
- Read the inputs (Read_Inputs)
- Read the outputs (Read_Outputs)
- Read diagnostic data (Slave_Diagnosis)
- Send configuration data (Set_Param)
- Check configuration data (Chk_Config)

Communication
- Cyclic Master-Slave Data transfer

Protective mechanisms
- Data transfer with HD = 4
- Time monitoring of the data traffic

Configuration
Settings in accordance with encoder profile
- Counting direction (CW, CCW)
- Class-2 functionality (ON, OFF)
- Scaling function (ON, OFF)

- „Activation of SSA-service“ 2)
- Selection of the station address 2)

Configuration
Setting the formats (IN/OUT) for the cyclic-data interchange via one configuration byte (K-1).

2 words IN/OUT data (I-1/O-1) 1)
4 words IN/OUT data (I-1, I-2, I-3/O-1) 2)

Data interchange: - Input Data (IN)
I-1 Position value 1) 4 bytes
I-2 Speed (0,1m/min) 2) 2 bytes
I-3 Time stamp 2) 2 bytes

Data interchange: - Output data (OUT)
O-1 PRESET Value 1) 4 bytes

Diagnostic information
Station-related diagnosis (63 bytes in accordance with Encoder Profil Class-2)

Setting: - PRESET value
The PRESET function is used for commissioning, and to allocate a specific position value to the current physical position.
The following settings are possible:
- by software: -- (see Output data)

Setting: - Counting direction
- by hardware via DIP switches S1
- by software via telegram

Counting direction increasing:
When the encoder travels in the direction of measuring element n to measuring element n+1.

Setting: - Station Address
- by hardware via DIP switch S1
- by software via telegram

The setting by software is carried out only if the „SSA-service“ has been previously activated.

Setting: - Bus termination
The 2-way DIP switch (S2) permits an internal bus termination to be switched in and out (ON/OFF).
If the bus is terminated externally, switch S2 must be in the OFF position.

Device specific file (*.GS_)
For the purpose of automatic commissioning of the encoder, use is made of the *.GS_-file. All the characteristic features of the device are defined in it.

STEG05F6.GSD	German
STEG05F6.GSE	English

1) As per Encoder Profile
2) Manufacturer-specific function

Order information see page 117

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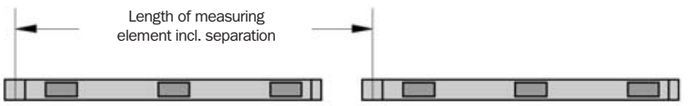
Dimensional drawing and order information



Dimension and calculation table

Measuring length	Read head length	Length of measuring element [1]	Mounting equipment per measuring element (proposed)
up to 38 m	0.87 m	2.30 m (Ident. A1 … AN)	4 Spacer supports or 8 Fastening clamps
up to 107 m	1.05 m	1.87 m (Ident. B1 … BN)	3 Spacer supports or 6 Fastening clamps
up to 354 m	1.38 m	2.50 m (Ident. C1 … CN)	4 Spacer supports or 8 Fastening clamps
up to 1700 m	2.03 m	1.90 m (Ident. D1 … DN)	3 Spacer supports or 6 Fastening clamps

[1] Including separation

Calculation example for a measuring length of 100 m

Choose the system with a max. measuring length of 107 m

$$\text{Number of measuring elements required} = \frac{\text{Desired measuring length}}{\text{Length of measuring element (see table above)}}$$

Number of measuring element = 100 m/1.87 m = **53.48**

Ordering quantity is therefore **54** pcs **measuring elements** and **54 * 3 = 162 spacer supports**

If **two separate measuring lengths** are required, then please order as **2 x 54** measuring elements (**not 108** measuring elements)

Length measuring systems

Length measuring system KH 53 – absolute, linear; measuring length up to 38 Meter

Type	Part no.	Measuring element length
KHK53-PXH00038	1 030 053	Read head 38, Profibus DP, Interface for Profibus Link Adaptor
		Profibus Link Adaptor please order separately (see page 120)
KHT53-XXX00038	1 030 055	Measuring element up to 38 m, coded
KHU53-XXX00038	1 030 056	Measuring element up to 38 m, universal, configurable [2]
KHM53-XXX00038	1 030 057	Mounting gauge 38

Length measuring system KH 53 – absolute, linear; measuring length up to 107 Meter

Type	Part no.	Measuring element length
KHK53-PXH00107	1 030 063	Read head 107, Profibus DP, Interface for Profibus Link Adaptor
		Profibus Link Adaptor please order separately (see page 120)
KHT53-XXX00107	1 030 065	Measuring element up to 107 m, coded
KHU53-XXX00107	1 030 066	Measuring element up to 107 m, universal, configurable [2]
KHM53-XXX00107	1 030 067	Mounting gauge 107

Length measuring system KH 53 – absolute, linear; measuring length up to 354 Meter

Type	Part no.	Measuring element length
KHK53-PXH00354	1 030 073	Read head 354, Profibus DP, Interface for Profibus Link Adaptor
		Profibus Link Adaptor please order separately (see page 120)
KHT53-XXX00354	1 030 075	Measuring element up to 354 m, coded
KHU53-XXX00354	1 030 076	Measuring element up to 354 m, universal, configurable [2]
KHM53-XXX00354	1 030 077	Mounting gauge 354

Length measuring system KH 53 – absolute, linear; measuring length up to 1700 Meter

Type	Part no.	Measuring element length
KHK53-AXR01700	1 030 083	Read head 1700, Profibus DP, Interface for Profibus Link Adaptor
		Profibus Link Adaptor please order separately (see page 120)
KHT53-XXX01700	1 030 085	Measuring element up to 1700 m, coded
KHU53-XXX01700	1 030 086	Measuring element up to 1700 m, universal, configurable [2]
KHM53-XXX01700	1 030 087	Mounting gauge 1700

[1] For temporary replacement of damaged measuring elements

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Resolution 0.1 mm

Linear Encoder

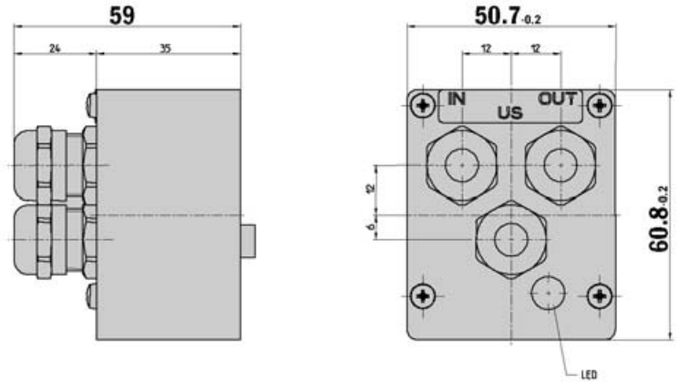
- Measuring length up to 1.7 km
- Non-contact length measuring system, wear free
- Absolute position measurement no initialising reference run
- Choice of electrical interfaces
- Position sampling time independent of length
- Degree of protection up to IP 66

CE

See chapter Accessories

Accessories for encoders

Dimensional drawing Profibus Link Adaptor KA3



General tolerances according to DIN ISO 2768-mk

KH 53 Profibus Link Adaptor KA3

Type	Part no.	Explanation
AD-KHK53-KA3PR	2 029 157	KH 53 Profibus Link Adaptor KA3

Switch settings

In the Profibus Link Adaptor it is possible to change the following settings via DIP switches or push buttons.

S 1 (1-7) Address setting (0 … 127)

S 1 (8-8) Counting direction (CW/CCW)

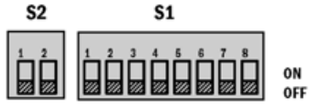
S 2 Bus termination

Access is provided via a removable screw cap (metrical/PG) on the rear of the Profibus Link Adaptor.

Status Information via LEDs

LED-1 Bus activity (red)

LED-2 Operating voltage (green)



General

The KH 53 Profibus is an absolute length measuring system with a resolution of 100 µm. The Bus coupling is realised within the encoder and is a Profibus DP slave in accordance with EN 50170 Vol. 2. The realisation of the Profibus interface is performed by the Profibus ASIC SPC3 from Siemens.

The KH 53 Profibus encompasses all Class 2 functions in accordance with Encoder Profile (1.1)

The encoder is implemented as a DP slave with general DP functions.

The conformance of the encoder with Profibus DP was verified by the PNO certified test centre.

The physical connection of the encoder is realised using a connection adaptor.
The following options are available:

- Cable exit with 3 cable glands

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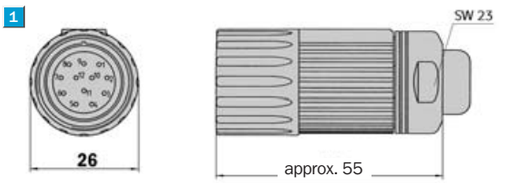
Dimensional drawings and order information

Screw-in system M23, 12 pin for SSI-Interface

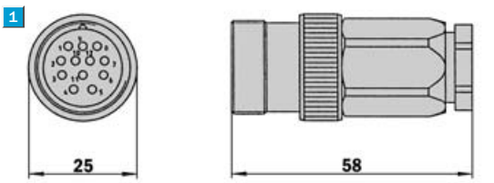
Connector M23 female, 12 pin

Type	Part no.	Contacts
DOS-2312-G	6 027 538	12



Connector M23 male, 12 pin

Type	Part no.	Contacts
STE-2312-G	6 027 537	12



Cable connector M23, 12 pin, straight, cable 12 core, SSI and programming, screened, flexible

Type	Part no.	Contacts	Cable length
DOL-2312-G1M5MA1	2 029 200	12	1.5 m
DOL-2312-G03MMA1	2 029 201	12	3.0 m
DOL-2312-G05MMA1	2 029 202	12	5.0 m
DOL-2312-G10MMA1	2 029 203	12	10.0 m
DOL-2312-G20MMA1	2 029 204	12	20.0 m
DOL-2312-G30MMA1	2 029 205	12	30.0 m

Cable 12 core, per meter, 4 x 2 x 0.25 + 2 x 0.5 + 2 x 0.14 mm² with screening, flexible, cable diameter 7.8 mm

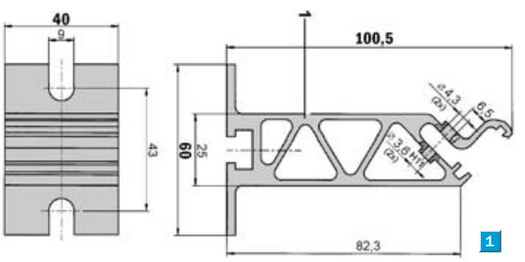
Type	Part no.	Cores	Explanation
LTG-2512-MW	6 027 531	12	
LTG-2612-MW	6 028 516	12	UV and salt water resistant

Mounting systems

Spacer support, height 100 mm, for KH 53, bored with srews *

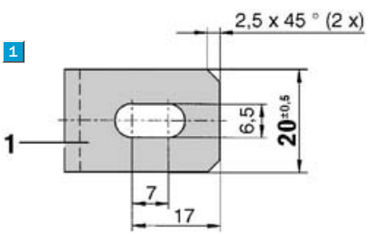
Type	Part no.
BEF-KHK-KHT53	2 029 158

* To fit measuring element



Fastening clamp for KH 53, screws not included

Type	Part no.
BEF-WK-KHT53	2 029 159



1 General tolerances according to DIN ISO 2768-mk

Adaptor modules for SSI Interface

Serial Parallel Adaptor

Type	Part no.	Explanation
AD-SSIG-PA	1 030 106	SSI Parallel Adaptor module, with plastic housing
AD-SSI-PA	1 030 107	SSI Parallel Adaptor module, without plastic housing
AD-SSIPG-PA	1 030 108	SSI Parallel Adaptor module, programmable, with plastic housing 2
AD-SSIPF-PA	1 030 109	SSI Parallel Adaptor module, programmable, without plastic housing, with front plate 2
AD-SSIP-PA	1 030 110	SSI Parallel Adaptor module, programmable, without plastic housing, without front plate 2

Connection system Sub-D for Adaptor modules

Cable connector Sub-D male, 15 pin, straight, screened

Type	Part no.	Contacts
STE-0D15-G	2 029 223	15

Cable connector Sub-D female, 37 pin, straight, screened

Type	Part no.	Contacts
DOS-0D37-G	2 029 224	37

Programming Tools

Programming Tool for KH 53 (with SSI Interface)

Type	Part no.
PGT-01-S	1 030 111

Programming Tool for SSI Adaptor modules 2

Type	Part no.
PGT-02-S	1 030 112