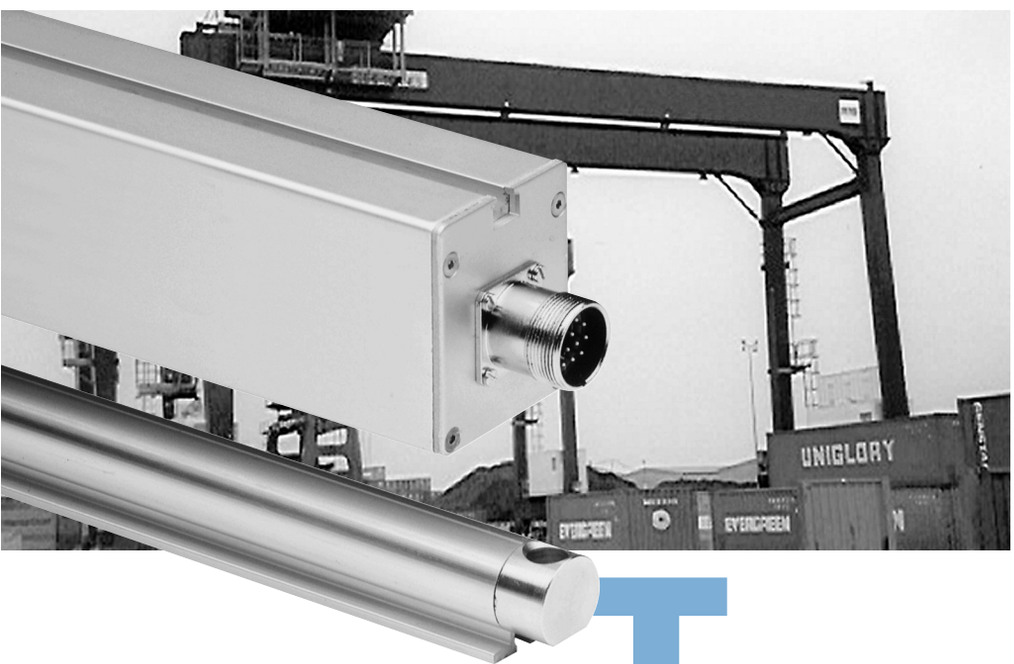
DATA SHEET

KH53/KH53 Advanced: Absolute Linear Encoders. Wear-free for rough environmental conditions



Resolution 0.1 mm

Linear Encoder

POMUX®

The POMUX KH53 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 measuring elements 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 resp. 55 mm.

With a measuring length of up to 1,700 m, the KH53 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.

SICK | STEGMANN

04-2009

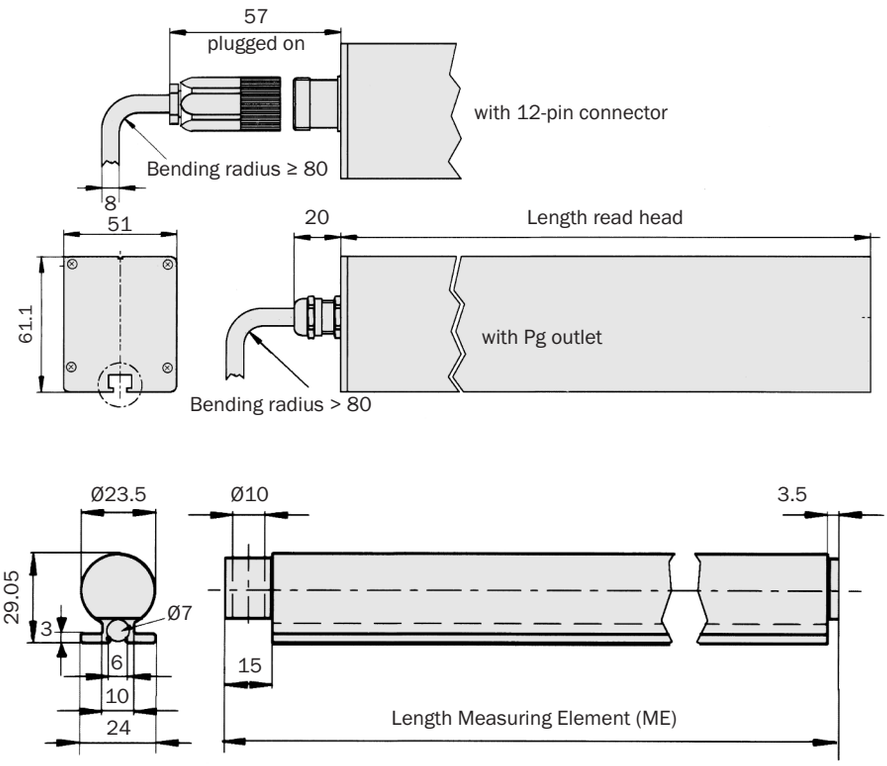
Resolution 0.1 mm

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 KH53 SSI

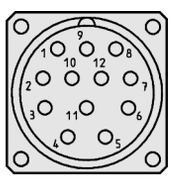


PIN and wire allocation SSI Interface [1)]

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

Accessories

- Connection Systems
- Mounting Systems
- Adapter Module
- Programming Tool



View of the connector M23 fitted to the encoder body SSI

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

Technical data		SSI	KH53	KH53 Advanced
System resolution		0.1 mm	■	■
Reproducibility		0.3 mm	■	
		1.0 mm		■
Measurement accuracy [1]		± 1000 + ME (Tu – 25 °C) Tk µm	■	
		± 2000 + ME (Tu – 25 °C) Tk µm		■
Position tolerances		± 10 mm	■	
(see diagram page 5)		± 20 mm		■
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	■	
	54	4.4 kg		■
	548	6.7 kg		■
Measuring element		Approx. 0.5 kg/m	■	
		Approx. 0.65 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	■	
		– 30 ... + 70 °C		■
Storage temperature range				
Read head		– 40 ... + 85 °C	■	■
Protection class acc. IEC 60529				
Read head head with cable		IP 66	■	■
Read head with srew-in system		IP 65 [4]	■	■
Max. movement speed [5]		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	■	■
Electrical connection		Cable outlet	■	■
		Screw-in connector system M23	■	■

[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 measuring element
Tu = Ambient temperature °C
(see diagram page 5)

[2] According DIN EN 61000-2-27

[3] According DIN EN 61000-2-6

[4] With mating connector fitted

[5] 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 see page 5, Order information see page 6/7.

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

Accessories

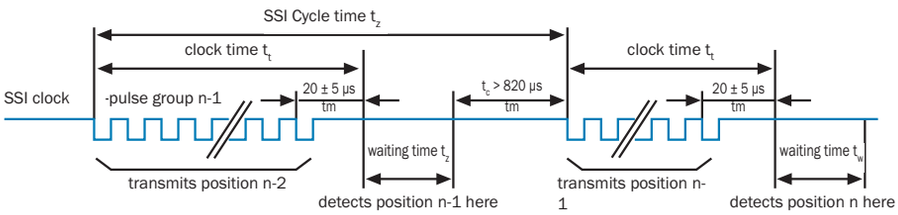
Connection Systems

Mounting Systems

Adapter Module

Programming Tool

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 KH53 :

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 KH53 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.

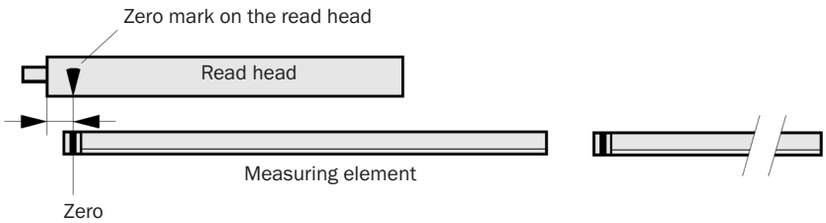
Waiting time condition

$t_w < t_z - t_t - t_c$

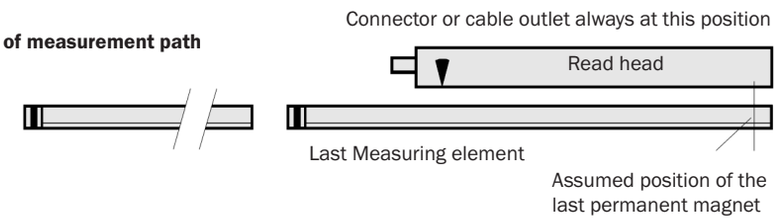
t_c = 820 µs

Position tolerances

Start of measuring path

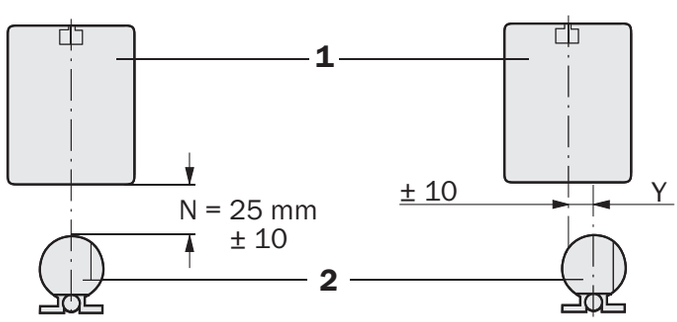


End of measurement path



KH53

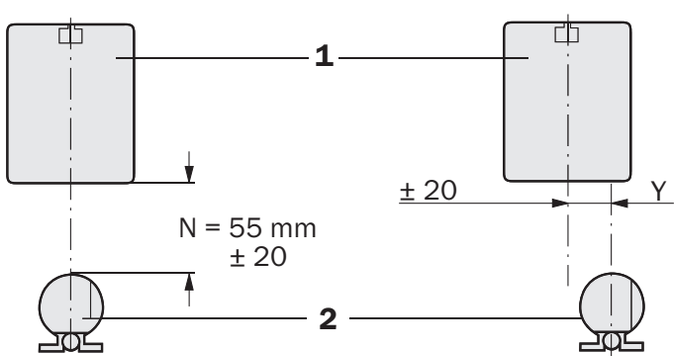
1 Read head
2 Measuring element



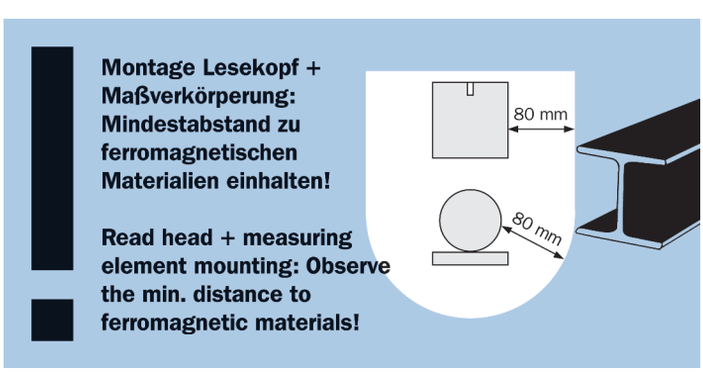
The reliability and accuracy of the measuring system are dependent upon maintaining the mounting tolerances! Magnetic and materials that can be magnetised, are not allowed within a radius of 80 mm of the measuring elements and the sensing face of the encoder.

KH53 Advanced

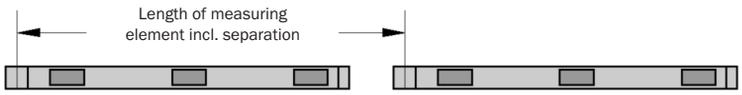
1 Read head
2 Measuring element



The reliability and accuracy of the measuring system are dependent upon maintaining the mounting tolerances! Magnetic and materials that can be magnetised, are not allowed within a radius of 80 mm of the measuring elements and the sensing face of the encoder.



Order information



Dimension and calculation table KH53

Measuring length up to	Read head length	Length of measuring element incl. separation	Mounting equipment per measuring element (proposed)
39.90 m	0.886 m	2.304 m Identification letters A1 ... ≤ A18	4 Spacer supports or 8 Fastening clamps
107.40 m	1.051 m	1.8688 m Identification letters B1 ... ≤ B58	3 Spacer supports or 6 Fastening clamps
351.20 m	1.376 m	2.5088 m Identification letters C1 ... ≤ C141	4 Spacer supports or 8 Fastening clamps
1676.40 m	2.026 m	1.9072 m Identification letters D1 ... ≤ D880	3 Spacer supports or 6 Fastening clamps

Dimension and calculation table KH53 Advanced

Measuring length up to	Read head length	Length of measuring element incl. separation	Mounting equipment per measuring element (proposed)
53.50 m	1.58 m	1.408 m Identification letters F1 ... ≤ F39	3 Spacer supports or 6 Fastening clamps
546.40 m	2.506 m	2.3552 m Identification letters G1 ... ≤ G233	4 Spacer supports or 8 Fastening clamps

The dimensions given are slightly rounded.

Order information

Calculation example for a measuring length of 100 m

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

Number of measuring elements required = $\dfrac{\text{Measuring length + Read head length}}{\text{Length of measuring element (according to table above)}}$

Number of measuring element = 101,051 m/1.8688 m = **54.07**

Ordering quantity is therefore **55** pcs **measuring elements** and **55 * 3 = 165 spacer supports**

If **two separate measuring lengths** are required, then please order as **2 x 55** measuring elements (**not 110** measuring elements)

Caution! For valid position determination, the reading head must not travel over the end of the last measuring element.

Length measuring systems

Length measuring system KH53 - absolute, linear; measuring length up to 38 m

Type	Part no.	Measuring element length
KHK53-AXR00038	1030048	Read head 38, SSI, cable 1.5 m
KHK53-AXS00038	1030049	Read head 38, SSI, cable 3.0 m
KHK53-AXT00038	1030050	Read head 38, SSI, cable 5.0 m
KHK53-AXU00038	1030051	Read head 38, SSI, cable 10.0 m
KHK53-AXB00038	1030052	Read head 38, SSI, connector M23, 12-pin
KHT53-XXX00038	1030055	Measuring element up to 38 m, coded
KHU53-XXX00038	1030056	Measuring element up to 38 m, universal, configurable [1]
KHM53-XXX00038	1030057	Mounting gauge 38

[1] For temporary replacement of damaged measuring elements

Order information

Length measuring systems KH53

Length measuring system KH53 – absolute, linear; measuring length up to 38 m

Type	Part no.	Explanation
KHK53-AXR00107	1030058	Read head 107, SSI, cable 1.5 m
KHK53-AXS00107	1030059	Read head 107, SSI, cable 3.0 m
KHK53-AXT00107	1030060	Read head 107, SSI, cable 5.0 m
KHK53-AXU00107	1030061	Read head 107, SSI, cable 10.0 m
KHK53-AXB00107	1030062	Read head 107, SSI, connector M23, 12-pin
KHT53-XXX00107	1030065	Measuring element up to 107 m, coded [1]
KHU53-XXX00107	1030066	Measuring element up to 107 m, universal, configurable [2]
KHM53-XXX00107	1030067	Mounting gauge 107

Length measuring system KH53 – absolute, linear; measuring length up to 354 m

Type	Part no.	Explanation
KHK53-AXR00354	1030068	Read head 354, SSI, cable 1.5 m
KHK53-AXS00354	1030069	Read head 354, SSI, cable 3.0 m
KHK53-AXT00354	1030070	Read head 354, SSI, cable 5.0 m
KHK53-AXU00354	1030071	Read head 354, SSI, cable 10.0 m
KHK53-AXB00354	1030072	Read head 354, SSI, connector M23, 12-pin
KHT53-XXX00354	1030075	Measuring element up to 354 m, coded [1]
KHU53-XXX00354	1030076	Measuring element up to 354 m, universal, configurable [2]
KHM53-XXX00354	1030077	Mounting gauge 354

Length measuring system KH53 – absolute, linear; measuring length up to 1700 m

Type	Part no.	Explanation
KHK53-AXR01700	1030078	Read head 1700, SSI, cable 1.5 m
KHK53-AXS01700	1030079	Read head 1700, SSI, cable 3.0 m
KHK53-AXT01700	1030080	Read head 1700, SSI, cable 5.0 m
KHK53-AXU01700	1030081	Read head 1700, SSI, cable 10.0 m
KHK53-AXB01700	1030082	Read head 1700, SSI, connector M23, 12-pin
KHT53-XXX01700	1030085	Measuring element up to 1700 m, coded [1]
KHU53-XXX01700	1030086	Measuring element up to 1700 m, universal, configurable [2]
KHM53-XXX01700	1030087	Mounting gauge 1700

Length measuring systems KH53 Advanced

Length measuring systems KH53 Advanced – absolute, linear; measuring length up to 54 m

Type	Part no.	Explanation
KHK53-AXT00054	1035442	Read head 54, SSI, cable 5.0 m
KHK53-AXB00054	1035443	Read head 54, SSI, connector M23, 12-pin
KHT53-XXX00054	1035445	Measuring element up to 54 m, coded [1]
KHU53-XXX00054	1035446	Measuring element up to 54 m, universal, configurable [2]
KHM53-XXX00054	1035447	Mounting gauge 54

Length measuring systems KH53 Advanced – absolute, linear; measuring length up to 548 m

Type	Part no.	Explanation
KHK53-AXT00548	1035448	Read head 548, SSI, cable 5.0 m
KHK53-AXB00548	1035449	Read head 548, SSI, connector M23, 12-pin
KHT53-XXX00548	1035451	Measuring element up to 548 m, coded [1]
KHU53-XXX00548	1035452	Measuring element up to 548 m, universal, configurable [2]
KHM53-XXX00548	1035453	Mounting gauge 548

[1] When placing a repeat order for particular defective measuring elements, please indicate the corresponding code number of the measuring element.

[2] For temporary replacement of damaged measuring elements

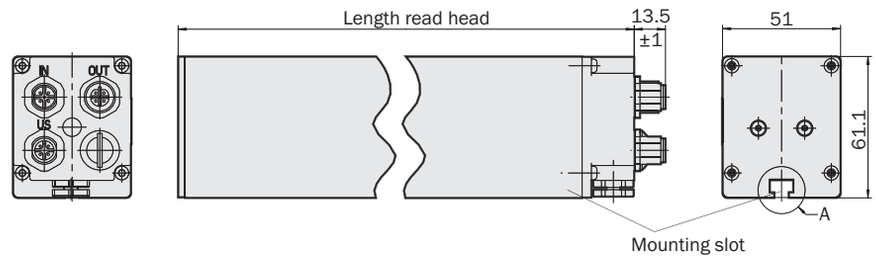
Resolution 0.1 mm

Linear Encoder

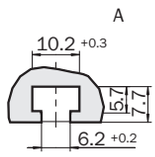
- Measuring length up to 1.7 km
- Non-contact length measuring system, wear free
- Absolute position measurement no initialising reference run
- Choice of electrical interfaces
- Position sampling time independent of length
- Degree of protection up to IP 67

CE

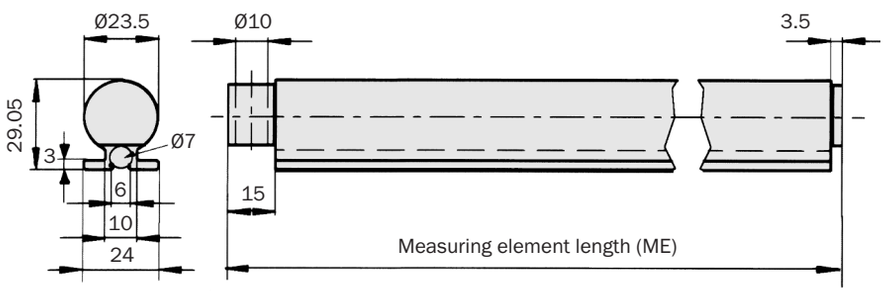
Dimensional drawing read head



Mounting slot designed for non-magnetic M6 DIN 933 screws.



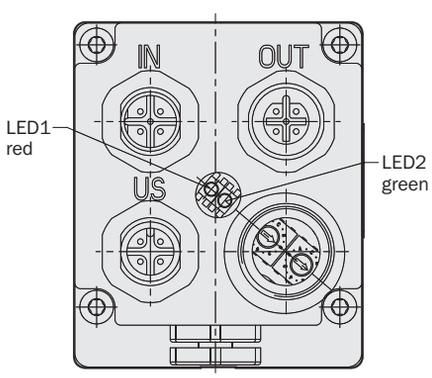
Dimensional drawing measuring element



PIN allocation for Profibus interface

Connect. 4-pin (Male)	Connect. 5-pin (Male)	Connect. 5-pin (Female)	Signal	Explanation
1	–	–	Us (24 V)	Supply voltage 10 ... 32 V
3	–	–	0 V (GND)	Ground (0 V)
–	–	4	B	B-cable Profibus DP (OUT)
–	–	2	A	A-cable Profibus DP (OUT)
–	4	–	B	B-cable Profibus DP (IN)
–	2	–	A	A-cable Profibus DP (IN)
–	–	1	2P5 [1]	+ 5 V (potential free)
–	–	3	2M [1]	0 V (potential free)
–	–	–	RTS [2]	Request to Send
2	1	–	N. C.	–
4	3	–	N. C.	–
–	5	5	Screen	Housing potential

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



Accessories

Mounting Systems

Connection Systems

Technical data		Profibus	KH53	KH53 Advanced
System resolution		0.1 mm	■	■
Reproducibility		0.3 mm	■	
		1.0 mm		■
Measurement accuracy [1]		± 1000 + ME (Tu – 25 °C) Tk µm	■	
		± 2000 + ME (Tu – 25 °C) Tk µm		■
Position tolerances		± 10 mm	■	
(see diagram page 11)		± 20 mm		■
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	■	
	54	4.4 kg		■
	548	6.7 kg		■
Measuring element		Approx. 0.5 kg/m	■	
		Approx. 0.65 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	■	
		– 30 ... + 70 °C		■
Storage temperature range				
Read head		– 40 ... + 85 °C	■	■
Protection class acc. IEC 60529				
Read head with link connector		IP 67 [4]	■	■
Max. movement speed [5]		6.6 m/s	■	■
Initialisation time		2 s	■	■
Position forming time		1.1 ms	■	■
Supply voltage		10 ... 32 V	■	■
Operating power consumption		2.0 W	■	■
Bus interface Profi-Bus DP			■	■
Elektrische interface [6]		RS 485	■	■
Protokoll		Profibus DP basic functions	■	■
		Profile for Encoders (07hex) – Class 2	■	■
Address setting (node number)		0 ... 127 (Hex 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 [7]		Via external switches	■	■
Electrical connection		Screw-in connector system M23 (3x)	■	■

[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 measuring element
Tu = Ambient temperature °C
(see diagram page 5)

[2] According DIN EN 61000-2-27

[3] According DIN EN 61000-2-6

[4] With mating connectors fitted

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

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

[7] Activation only at the last bus subscriver of the line.

Position tolerances see page 11, Order information see page 12/13.

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 Hex switch S2
- by software via telegram

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

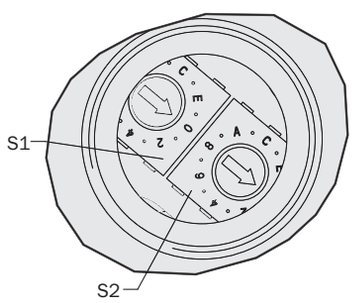
Setting: - Station Address
- by hardware via Hex switch S1/S2
- by software via telegram

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

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

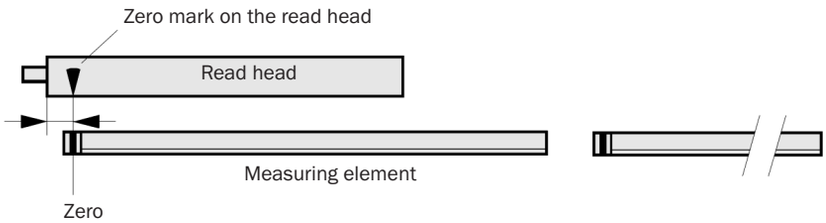
[1)] As per Encoder Profile
[2)] Manufacturer-specific function



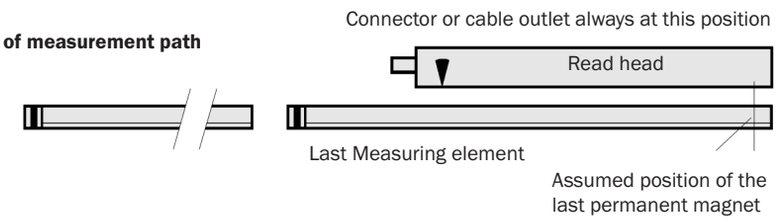
Order information see page 12/13.

Position tolerances

Start of measuring path

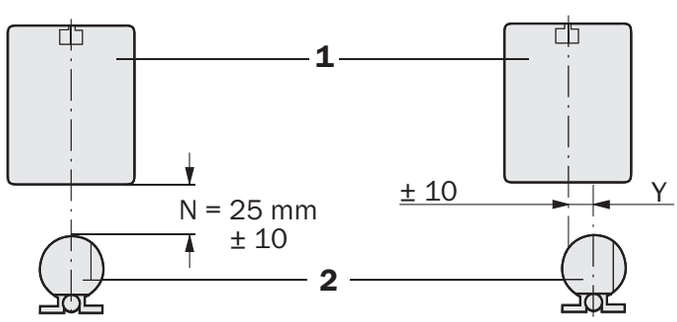


End of measurement path



KH53

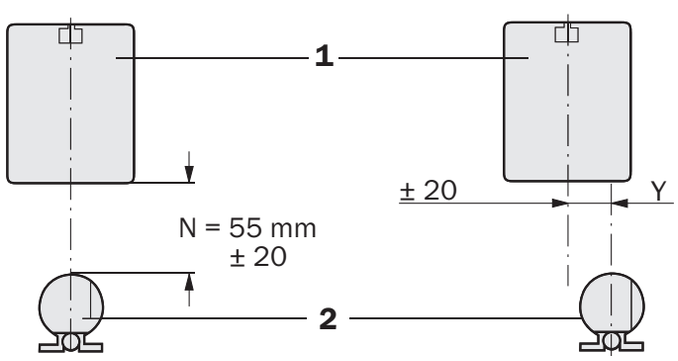
1 Read head
2 Measuring element



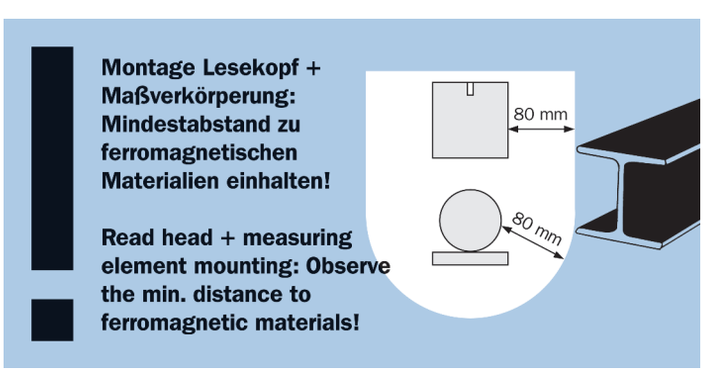
The reliability and accuracy of the measuring system are dependent upon maintaining the mounting tolerances! Magnetic and materials that can be magnetised, are not allowed within a radius of 80 mm of the measuring elements and the sensing face of the encoder.

KH53 Advanced

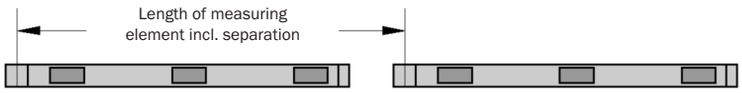
1 Read head
2 Measuring element



The reliability and accuracy of the measuring system are dependent upon maintaining the mounting tolerances! Magnetic and materials that can be magnetised, are not allowed within a radius of 80 mm of the measuring elements and the sensing face of the encoder.



Dimensional drawing and order information



Dimension and calculation table KH53

Measuring length up to	Read head length	Length of measuring element incl. separation	Mounting equipment per measuring element (proposed)
39.90 m	0.905 m	2.304 m Identification letters A1 ... ≤ A18	4 Spacer supports or 8 Fastening clamps
107.40 m	1.070 m	1.8688 m Identification letters B1 ... ≤ B58	3 Spacer supports or 6 Fastening clamps
351.20 m	1.395 m	2.5088 m Identification letters C1 ... ≤ C141	4 Spacer supports or 8 Fastening clamps
1676.40 m	2.045 m	1.9072 m Identification letters D1 ... ≤ D880	3 Spacer supports or 6 Fastening clamps

Dimension and calculation table KH53 Advanced

Measuring length up to	Read head length	Length of measuring element incl. separation	Mounting equipment per measuring element (proposed)
53.50 m	1.599 m	1.408 m Identification letters F1 ... ≤ F39	3 Spacer supports or 6 Fastening clamps
546.40 m	2.525 m	2.3552 m Identification letters G1 ... ≤ G233	4 Spacer supports or 8 Fastening clamps

The dimensions given are slightly rounded.

Order information

Calculation example for a measuring length of 100 m

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

Number of measuring elements required = $\dfrac{\text{Measuring length + Read head length}}{\text{Length of measuring element (according to table above)}}$

Number of measuring element = 101,070 m/1.8688 m = **54.08**

Ordering quantity is therefore **55** pcs **measuring elements** and **55 * 3 = 165 spacer supports**

If **two separate measuring lengths** are required, then please order as **2 x 55** measuring elements (**not 110** measuring elements)

Caution! For valid position determination, the reading head must not travel over the end of the last measuring element.

Order information

Length measuring system

Length measuring system KH53 – absolute, linear; measuring length up to 38 m

Type	Part no.	Explanation
KHK53-PXF00038	1036163	Read head 38, Profibus DP
KHT53-XXX00038	1030055	Measuring element up to 38 m, coded [1]
KHU53-XXX00038	1030056	Measuring element up to 38 m, universal, configurable [2]
KHM53-XXX00038	1030057	Mounting gauge 38

Length measuring system KH53 – absolute, linear; measuring length up to 107 m

Type	Part no.	Explanation
KHK53-PXF00107	1036164	Read head 107, Profibus DP
KHT53-XXX00107	1030065	Measuring element up to 107 m, coded [1]
KHU53-XXX00107	1030066	Measuring element up to 107 m, universal, configurable [2]
KHM53-XXX00107	1030067	Mounting gauge 107

Length measuring system KH53 – absolute, linear; measuring length up to 354 m

Type	Part no.	Explanation
KHK53-PXF00354	1036165	Read head 354, Profibus DP
KHT53-XXX00354	1030075	Measuring element up to 354 m, coded [1]
KHU53-XXX00354	1030076	Measuring element up to 354 m, universal, configurable [2]
KHM53-XXX00354	1030077	Mounting gauge 354

Length measuring system KH53 – absolute, linear; measuring length up to 1700 m

Type	Part no.	Explanation
KHK53-PXF01700	1036166	Read head 1700, Profibus DP
KHT53-XXX01700	1030085	Measuring element up to 1700 m, coded [1]
KHU53-XXX01700	1030086	Measuring element up to 1700 m, universal, configurable [2]
KHM53-XXX01700	1030087	Mounting gauge 1700

Length measuring system KH53 Advanced

Length measuring system KH53 Advanced – absolute, linear; measuring length up to 54 m

Type	Part no.	Explanation
KHK53-PXF00054	1036167	Read head 54, Profibus DP
KHT53-XXX00054	1035445	Measuring element up to 54 m, coded [1]
KHU53-XXX00054	1035446	Measuring element up to 54 m, universal, configurable [2]
KHM53-XXX00054	1035447	Mounting gauge 54

Length measuring system KH53 Advanced – absolute, linear; measuring length up to 548 m

Type	Part no.	Explanation
KHK53-PXF00548	1036168	Read head 548, Profibus DP
KHT53-XXX00548	1035451	Measuring element up to 548 m, coded [1]
KHU53-XXX00548	1035452	Measuring element up to 548 m, universal, configurable [2]
KHM53-XXX00548	1035453	Mounting gauge 548

[1] When placing a repeat order for particular defective measuring elements, please indicate the corresponding code number of the measuring element.

[2] For temporary replacement of damaged measuring elements

Switch settings

The following settings are possible via Hex switch:

S1/S2	Address setting (0 ... 127)
S2	Counting direction (CW/CCW)

Access is provided via a screw cap on the connector side of the read head.

Status Information via LEDs

LED-1	Bus activity (red)
LED-2	Operating voltage (green)

General

The KH53 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 KH53 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.

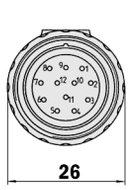
The following options are available:
- Screw-in connnector system M12

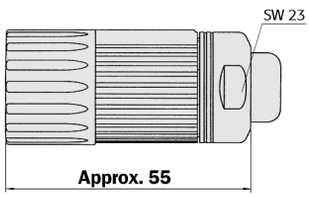
Dimensional drawings and order information

Screw-in system M23, 12-pin for KH53 with SSI-Interface

Connector M23 female, 12-pin

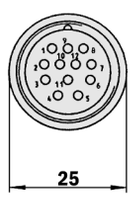
Type	Part no.	Contacts
DOS-2312-G	6027538	12

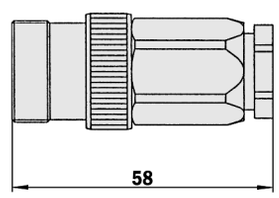




Connector M23 male, 12-pin

Type	Part no.	Contacts
STE-2312-G	6027537	12





Connector M23 female, 12-pin, straight, cable 12 cores, 4 x 2 x 0.25 + 2 x 0.5 + 2 x 0.14 mm², SSI and programming, with screening, capable of beeing dragged, not salt water and UV resistant

Type	Part no.	Contacts	Cable length
DOL-2312-G1M5MA1	2029200	12	1.5 m
DOL-2312-G03MMA1	2029201	12	3.0 m
DOL-2312-G05MMA1	2029202	12	5.0 m
DOL-2312-G10MMA1	2029203	12	10.0 m
DOL-2312-G20MMA1	2029204	12	20.0 m
DOL-2312-G30MMA1	2029205	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	6027531	12	
LTG-2612-MW	6028516	12	Salt water and UV resistant

Screw-in system M12 for KH53 Profibus interface

Cable receptacle/cable plug M12, for Profibus voltage supply

Type	Part no.	Contacts	Explanation
DOS-1204-G	6007302	4	Female connector, M12, 4-pin, straight

Cable receptacle/cable plug M12, for Profibus data cable

Type	Part no.	Explanation
PR-DOS-1205-G	6021353	Profibus female connector, M12, 5-pin, straight, screened, B-coded
PR-STE-1205-G	6021354	Profibus male connector, M12, 5-pin, straight, screened, B-coded

Female connector M12, 4-pin, straight, with cable 4-core for Profibus voltage supply

Type	Part no.	Explanation
DOL-1204-G05M	6009866	Cable 5.0 m, PVC

Female connector M12, 5-pin, straight, with cable 2-core, screened, for Profibus data cable

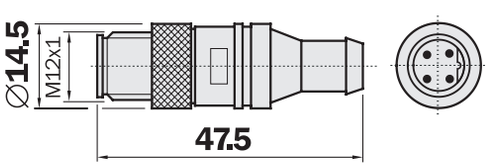
Type	Part no.	Explanation
DOL-12PR-G05M	6026006	Cable 5.0 m, B-coded
DOL-12PR-G10M	6026008	Cable 10.0 m, B-coded

Male connector, 5-pin, straight, with cable 2-core, screened, for Profibus data cable

Type	Part no.	Explanation
STL-12PR-G05M	6026005	Cable 5.0 m, B-coded
STL-12PR-G10M	6026007	Cable 10.0 m, B-coded

Profibus terminal resistor

Type	Part no.
PR-STE-END	6021156



Data cable for Profibus, 2-core, by the meter, screened

Type	Part no.	Cores
LTG-2102-MW	6021355	2

Dimensional drawings and order information

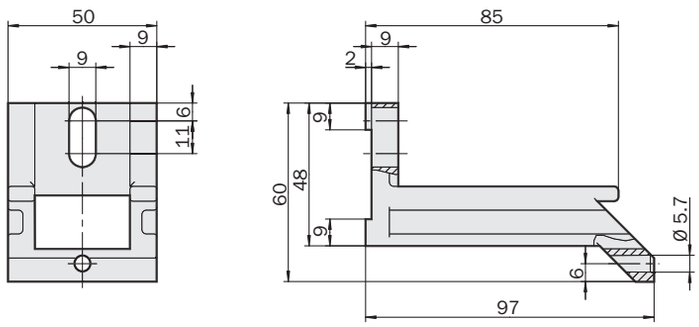
Mounting systems

Spacer support for KH53, bored with srews

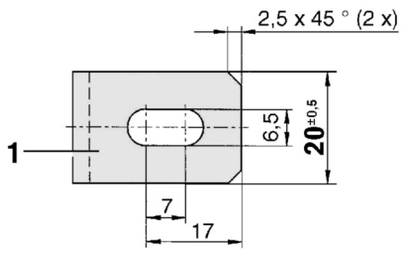
Type	Part no.
BEF-KHK-KHT53	2042468

Fastening clamp for KH53, screws not included

Type	Part no.
BEF-WK-KHT53	2029159



General tolerances according to DIN ISO 2768-mk



General tolerances according to DIN ISO 2768-mk

Adapter module for SSI interface

Serial Parallel Adapter

Type	Part no.	Explanation
AD-SSIG-PA	1030106	SSI Parallel Adapter module, with plastic housing
AD-SSI-PA	1030107	SSI Parallel Adapter module, without plastic housing

Connection system Sub-D for Adapter modules

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

Type	Part no.	Contacts
STE-0D15-G	2029223	15

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

Type	Part no.	Contacts
DOS-0D37-G	2029224	37

Programming Tool

Programming Tool for KH53 (with SSI Interface)

Type	Part no.
PGT-01-S	1030111

Australia
Phone +61 3 9497 4100
1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Belgium/Luxembourg
Phone +32 (0)2 466 55 66
E-Mail info@sick.be

Brasil
Phone +55 11 3215-4900
E-Mail sac@sick.com.br

Ceská Republika
Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

China
Phone +852-2763 6966
E-Mail ghk@sick.com.hk

Danmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Deutschland
Phone +49 211 5301-250
E-Mail info@sick.de

España
Phone +34 93 480 31 00
E-Mail info@sick.es

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Great Britain
Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

India
Phone +91–22–4033 8333
E-Mail info@sick-india.com

Israel
Phone +972-4-999-0590
E-Mail info@sick-sensors.com

Italia
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 (0)3 3358 1341
E-Mail support@sick.jp

Nederlands
Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

Norge
Phone +47 67 81 50 00
E-Mail austefjord@sick.no

Österreich
Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Polska
Phone +48 22 837 40 50
E-Mail info@sick.pl

Republic of Korea
Phone +82-2 786 6321/4
E-Mail kang@sickkorea.net

Republika Slowenija
Phone +386 (0)1-47 69 990
E-Mail office@sick.si

România
Phone +40 356 171 120
E-Mail office@sick.ro

Russia
Phone +7 495 775 05 34
E-Mail info@sick-automation.ru

Schweiz
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Singapore
Phone +65 6744 3732
E-Mail admin@sicksgp.com.sg

Suomi
Phone +358-9-25 15 800
E-Mail sick@sick.fi

Sverige
Phone +46 10 110 10 00
E-Mail info@sick.se

Taiwan
Phone +886 2 2375-6288
E-Mail sickgrc@ms6.hinet.net

Türkiye
Phone +90 216 587 74 00
E-Mail info@sick.com.tr

USA/Canada/México
Phone +1(952) 941-6780
1 800-325-7425 – tollfree
E-Mail info@sickusa.com

More representatives and agencies
in all major industrial nations at
www.sick.com

SICK AG | Waldkirch | Germany | www.sick.com
SICK STEGMANN GmbH | Donaueschingen
Germany | www.sick-stegmann.de

SICK | STEGMANN

8 010 310/2009-04-xx • MD/6/xx • Printed in Germany (2009-04) • Subject to change without notice . The specified product features and technical data do not represent any guarantee . STEG A4 2c int32