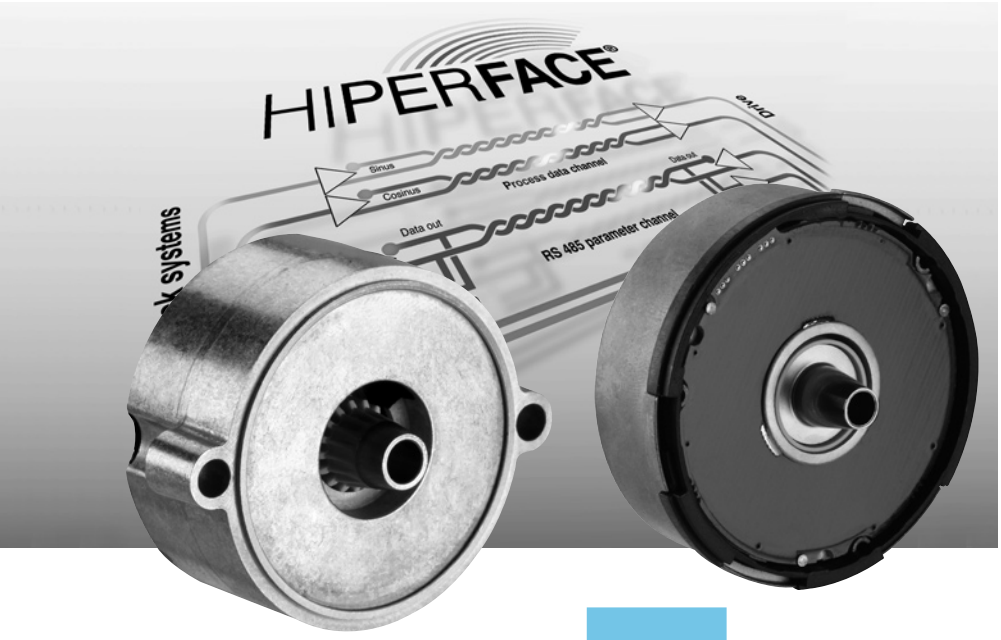
SinCos® SEK/SEL52 and SEK/SEL37: Motor Feedback Systems with HIPERFACE® interface

DATA SHEET



16 sine/ cosine periods

Motor Feedback System

HIPERFACE® by SICK|STEGMANN

RoHS 2002/95/EC

Extreme robustness, multiturn capability and all benefits of the HIPERFACE® interface are reflected in the new SinCos® SEK/SEL52 and SEK/SEL37 product ranges.

At the heart of these new ranges is a bearing-less, capacitive sensor element.

The holistic scanning almost completely compensates for eccentricity errors. The capacitive operating principle can function without ball bearings and is therefore extremely robust. By dispensing with wearing parts, possible error sources are largely excluded, and the motor feedback systems have a high temperature resistance previously reserved for resolvers. Moreover, the system construction allows extremely low power consumption.

The compact SEK/SEL37 products are designed for mounting onto conical shafts. In addition to the shoulder clamping used with resolvers, SEK/SEL device types in the 2.1" housing also feature hollow shaft and conical shaft types. Thus, these motor feedback systems with high resolution are particularly suited to industrial applications requiring a compact, precise and cost-effective solution.

SICK|STEGMANN

11-2008

HVS PRECONISATEUR DE SOLUTIONS DEPUIS 1985
2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel : 03 26 82 49 29
E-mail:hvssystem@hvssystem.com
Site web : www.hvssystem.com

16 sine/ cosine periods

Motor Feedback System

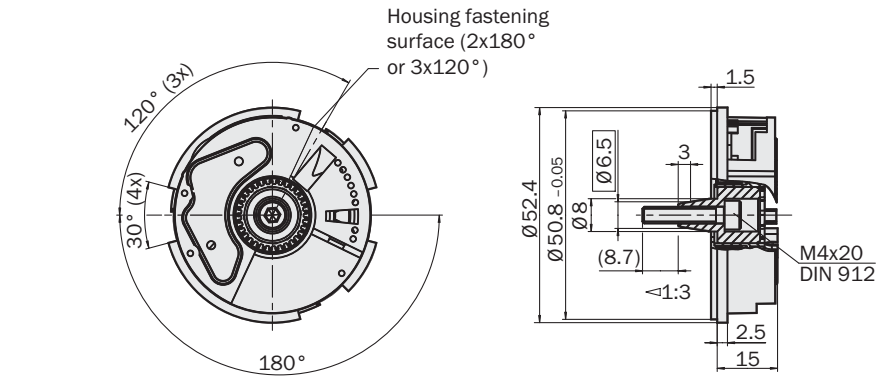
- 16 sine/cosine periods per revolution
- 4,096 revolutions measurable (Multiturn)
- Programming of the positional value
- Electronic type lable

RoHS 2002/95/EC

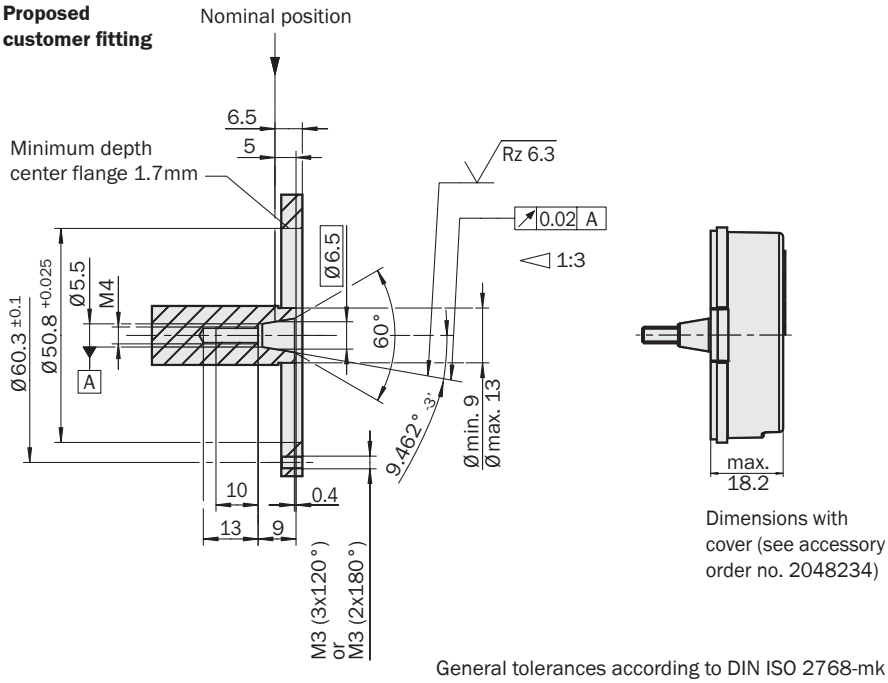
Accessories

- Connection systems
- Mounting systems
- Programming Tool
- Cover

Dimensional drawing SEK/SEL52 tapered shaft



Proposed customer fitting



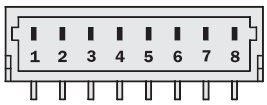
Dimensions with cover (see accessory order no. 2048234)

General tolerances according to DIN ISO 2768-mk

Pin and wire allocation

PIN	Signal	Colour of wires	Explanation
1	U_S	red	Supply voltage7 ... 12 V
2	+ SIN	white	Process data channel
3	REFSIN	brown	Process data channel
4	+ COS	pink	Process data channel
5	REFCOS	black	Process data channel
6	GND	blue	Ground connection
7	Data +	grey or yellow	RS485-parameter channel
8	Data –	green or purple	RS485-parameter channel

The GND-(0V) connection of the supply voltage has no connection to the housing.



Technical Data to DIN 32878		Tapered shaft SEK/SEL52	SEK	SEL
Number of sine/cosine periods per revolution		16	■	■
Number of the absolute ascertainable revolutions	Single SEK	1	■	
	Multi SEL	4,096		■
Dimensions		mm (see dimensional drawing)	■	■
Mass		0.04 kg	■	■
Mass with cover [1]		0.07 kg	■	■
Moment of inertia to the rotor		7 gcm^2	■	■
Code type for the absolut value		Binary	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)		Increasing	■	■
Measurement step at interpolation of the sine/cosine signals with e. g. 12 bits		20 angular seconds	■	■
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 288 angular seconds	■	■
Non-linearity within a sine/cosine period				
differential non-linearity		± 72 angular seconds [2]	■	■
Working speed up to which the absolute position can be reliably produced		6,000 min^{-1}	■	■
Max. Operating speed	Single SEK	12,000 min^{-1}	■	
	Multi SEL	10,000 min^{-1}		■
Max. angular acceleration		5 x 10^5 rad/s^2	■	■
Permissible shaft movement				
axial		± 0.5 mm	■	■
radial		± 0.15 mm	■	■
Working temperature range	Single SEK	– 40 ... + 115 °C	■	
	Multi SEL	– 20 ... + 115 °C		■
Storage temperature range [3]		– 50 ... + 125 °C	■	■
Permissible relative humidity		90 % [4]	■	■
Resistance				
To shocks [5]		100 g/10 ms	■	■
To vibration [6]		50 g/10 ... 2000 Hz	■	■
Protection class to IEC 60529 [7]		IP 40	■	■
EMC [8]			■	■
Operating voltage range		7 ... 12 V	■	■
Recommended supply voltage		8 V	■	■
Max. operating current, no load		< 50 mA	■	■
Available memory area				
within EEPROM 2048 [9]		1,792 bytes	■	■
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential	■	■
Parameter channel = RS 485		Digital	■	■

[1] Accessory part no. 2048234

[2] At nominal position ± 0.1 mm

[3] Without packaging

[4] Condensation not permitted

[5] To EN 60068-2-27

[6] To EN 60068-2-6

[7] With mating connector inserted and closed cover

[8] To EN 61000-6-2 and EN 61000-6-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen and by using the cover (see accessory part no. 2048234).
Users must perform their own tests when other screen designs are used.

[9] If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.

Ordering information

SEK/SEL52 tapered shaft

Type	Part no.	Description
SEK52-HFA0-K02	1037368	Single
SEL52-HFA0-K02	1037371	Multi

16 sine/ cosine periods

Motor Feedback System

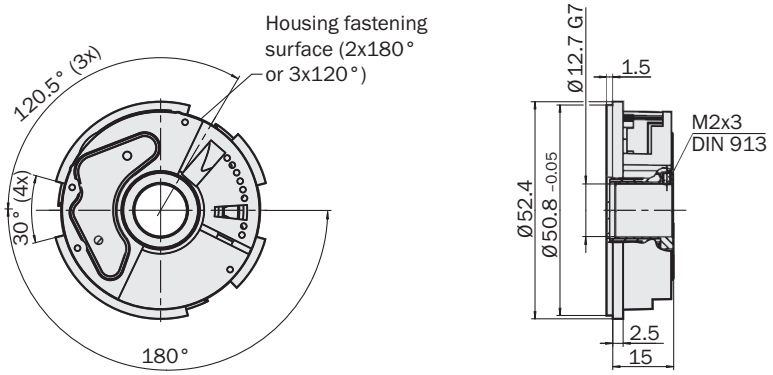
- 16 sine/cosine periods per revolution
- 4,096 revolutions measurable (Multiturn)
- Programming of the positional value
- Electronic type lable

RoHS 2002/95/EC

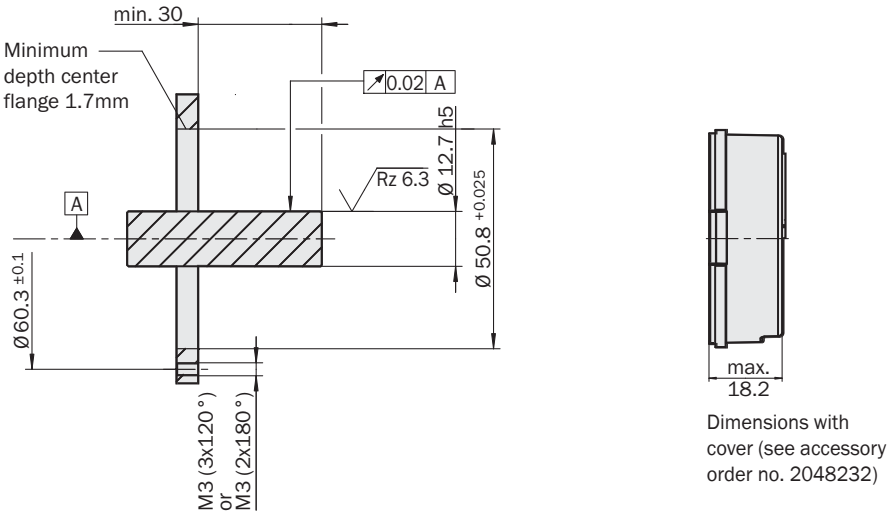
Accessories

- Connection systems
- Mounting systems
- Programming Tool
- Cover

Dimensional drawing SEK/SEL52 hollow shaft



Proposed customer fitting



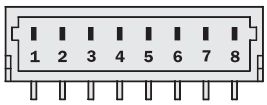
Dimensions with cover (see accessory order no. 2048232)

General tolerances according to DIN ISO 2768-mk

Pin and wire allocation

PIN	Signal	Colour of wires	Explanation
1	U_S	red	Supply voltage7 ... 12 V
2	+ SIN	white	Process data channel
3	REFSIN	brown	Process data channel
4	+ COS	pink	Process data channel
5	REFCOS	black	Process data channel
6	GND	blue	Ground connection
7	Data +	grey or yellow	RS485-parameter channel
8	Data –	green or purple	RS485-parameter channel

The GND-(0V) connection of the supply voltage has no connection to the housing.



Technical Data to DIN 32878		Hollow shaft SEK/SEL52	SEK	SEL
Number of sine/cosine periods per revolution		16	■	■
Number of the absolute ascertainable revolutions	Single SEK	1	■	
	Multi SEL	4,096		■
Dimensions		mm (see dimensional drawing)	■	■
Mass		0.04 kg	■	■
Mass with cover [1]		0.06 kg	■	■
Moment of inertia to the rotor		7 gcm^2	■	■
Code type for the absolut value		Binary	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)		Increasing	■	■
Measurement step at interpolation of the sine/cosine signals with e. g. 12 bits		20 angular seconds	■	■
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 288 angular seconds	■	■
Non-linearity within a sine/cosine period				
differential non-linearity		± 72 angular seconds [2]	■	■
Working speed up to which the absolute position can be reliably produced		6,000 min^{-1}	■	■
Max. Operating speed	Single SEK	12,000 min^{-1}	■	
	Multi SEL	10,000 min^{-1}		■
Max. angular acceleration		5 x 10^5 rad/s^2	■	■
Permissible shaft movement				
axial		± 0.5 mm	■	■
radial		± 0.15 mm	■	■
Working temperature range	Single SEK	– 40 ... + 115 °C	■	
	Multi SEL	– 20 ... + 115 °C		■
Storage temperature range [3]		– 50 ... + 125 °C	■	■
Permissible relative humidity		90 % [4]	■	■
Resistance				
To shocks [5]		100 g/10 ms	■	■
To vibration [6]		50 g/10 ... 2000 Hz	■	■
Protection class to IEC 60529 [7]		IP 40	■	■
EMC [8]			■	■
Operating voltage range		7 ... 12 V	■	■
Recommended supply voltage		8 V	■	■
Max. operating current, no load		< 50 mA	■	■
Available memory area				
within EEPROM 2048 [9]		1,792 bytes	■	■
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential	■	■
Parameter channel = RS 485		Digital	■	■

[1] Accessory part no. 2048232

[2] At nominal position ± 0.1 mm

[3] Without packaging

[4] Condensation not permitted

[5] To EN 60068-2-27

[6] To EN 60068-2-6

[7] With mating connector inserted and closed cover

[8] To EN 61000-6-2 and EN 61000-6-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen and by using the cover (see accessory part no. 2048232).
Users must perform their own tests when other screen designs are used.

[9] If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.

Ordering information

SEK/SEL52 hollow shaft

Type	Part no.	Description
SEK52-HNA0-K02	1037370	Single
SEL52-HNA0-K02	1037373	Multi

16 sine/ cosine periods

Motor Feedback System

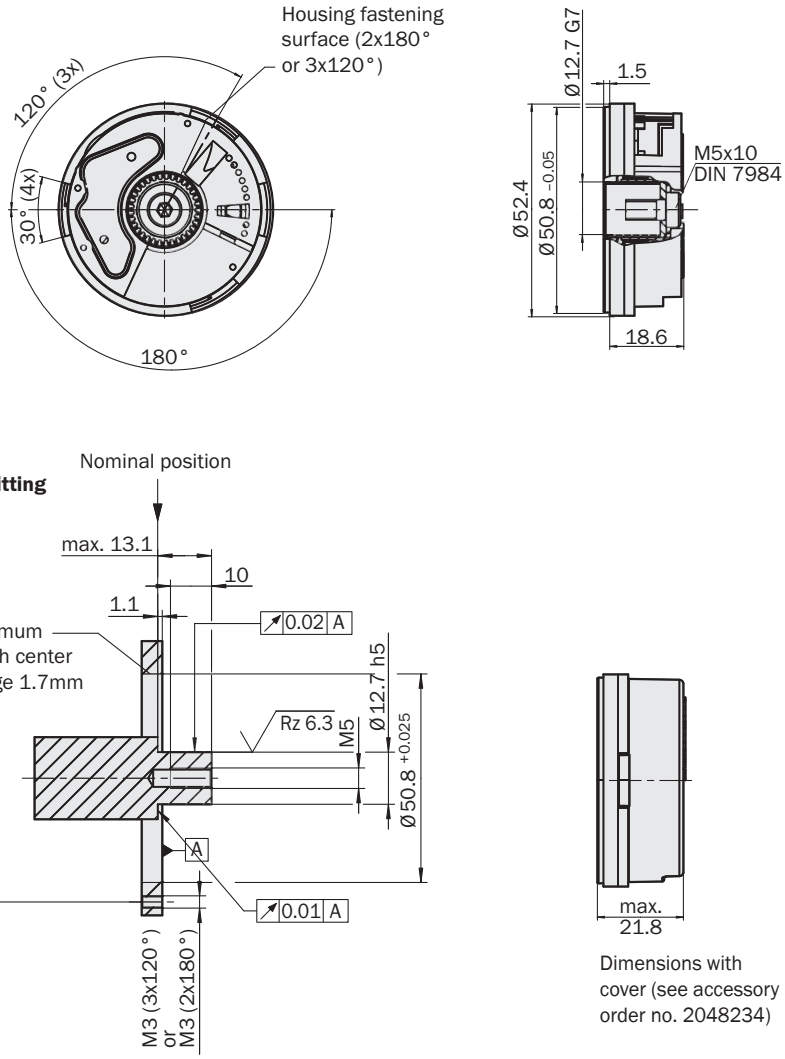
- 16 sine/cosine periods per revolution
- 4,096 revolutions measurable (Multiturn)
- Programming of the positional value
- Electronic type lable

RoHS 2002/95/EC

Accessories

- Connection systems
- Mounting systems
- Programming Tool
- Cover

Dimensional drawing SEK/SEL52 with shoulder clamping



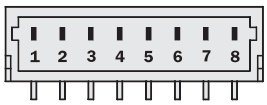
Dimensions with cover (see accessory order no. 2048234)

General tolerances according to DIN ISO 2768-mk

Pin and wire allocation

PIN	Signal	Colour of wires	Explanation
1	U_S	red	Supply voltage7 ... 12 V
2	+ SIN	white	Process data channel
3	REFSIN	brown	Process data channel
4	+ COS	pink	Process data channel
5	REFCOS	black	Process data channel
6	GND	blue	Ground connection
7	Data +	grey or yellow	RS485-parameter channel
8	Data –	green or purple	RS485-parameter channel

The GND-(0V) connection of the supply voltage has no connection to the housing.



Technische Daten nach DIN 32878		Shoulder clamping SEK/SEL52	SEK	SEL
Number of sine/cosine periods per revolution		16	■	■
Number of the absolute ascertainable revolutions	Single SEK	1	■	
	Multi SEL	4,096		■
Dimensions		mm (see dimensional drawing)	■	■
Mass		0.04 kg	■	■
Mass with cover [1]		0.07 kg	■	■
Moment of inertia to the rotor		6 gcm^2	■	■
Code type for the absolut value		Binary	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)		Increasing	■	■
Measurement step at interpolation of the sine/cosine signals with e. g. 12 bits		20 angular seconds	■	■
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 288 angular seconds	■	■
Non-linearity within a sine/cosine period				
differential non-linearity		± 72 angular seconds [2]	■	■
Working speed up to which the absolute position can be reliably produced		6,000 min^{-1}	■	■
Max. Operating speed	Single SEK	12,000 min^{-1}	■	
	Multi SEL	10,000 min^{-1}		■
Max. angular acceleration		5 x 10^5 rad/s^2	■	■
Permissible shaft movement				
axial		± 0.5 mm	■	■
radial		± 0.15 mm	■	■
Working temperature range	Single SEK	– 40 ... + 115 °C	■	
	Multi SEL	– 20 ... + 115 °C		■
Storage temperature range [3]		– 50 ... + 125 °C	■	■
Permissible relative humidity		90 % [4]	■	■
Resistance				
To shocks [3]		100 g/10 ms	■	■
To vibration [4]		50 g/10 ... 2000 Hz	■	■
Protection class to IEC 60529 [5]		IP 40	■	■
EMC [6]			■	■
Operating voltage range		7 ... 12 V	■	■
Recommended supply voltage		8 V	■	■
Max. operating current, no load		< 50 mA	■	■
Available memory area				
within EEPROM 2048 [7]		1,792 bytes	■	■
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential	■	■
Parameter channel = RS 485		Digital	■	■

[1] Accessory part no. 2048234

[2] At nominal position ± 0.1 mm

[3] Without packaging

[4] Condensation not permitted

[5] To EN 60068-2-27

[6] To EN 60068-2-6

[7] With mating connector inserted and closed cover

[8] To EN 61000-6-2 and EN 61000-6-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen and by using the cover (see accessory part no. 2048234).
Users must perform their own tests when other screen designs are used.

[9] If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.

Ordering information

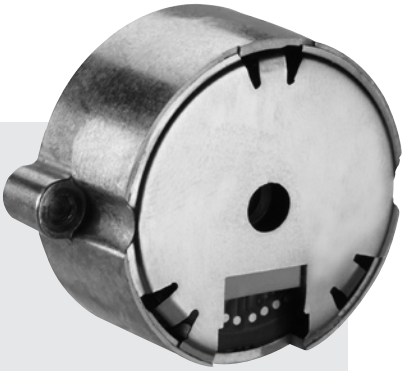
SEK/SEL52 with shoulder clamping

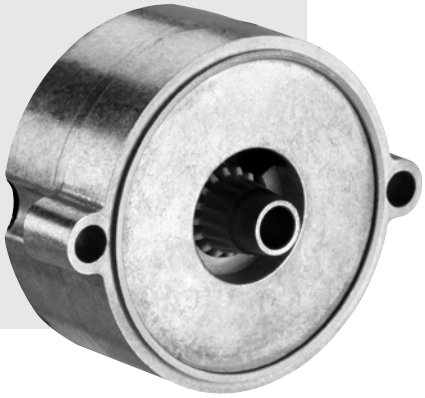
Type	Part no.	Description
SEK52-H1A0-K02	1037369	Single
SEL52-H1A0-K02	1037372	Multi

16 sine/ cosine periods

Motor Feedback System

- 16 sine/cosine periods per revolution
- 4,096 revolutions measurable (Multiturn)
- Programming of the positional value
- Electronic type lable





RoHS 2002/95/EC

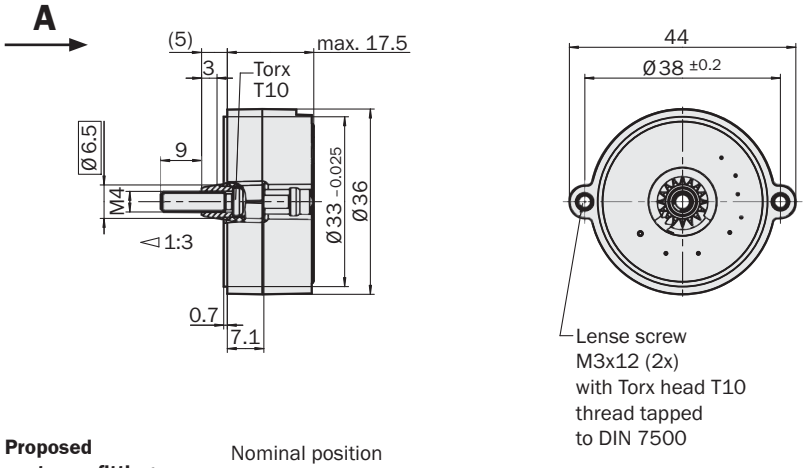
Accessories

Connection systems

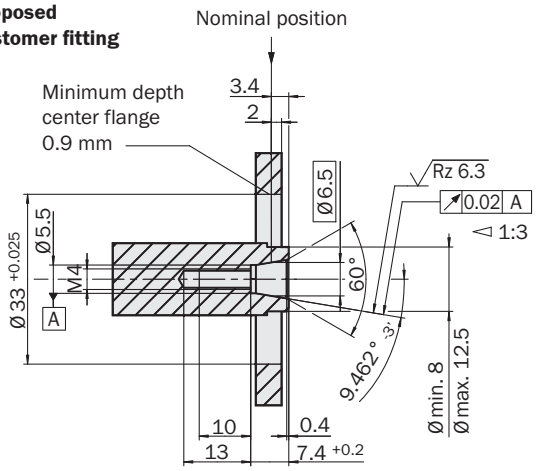
Mounting systems

Programming Tool

Dimensional drawing SEK/SEL37 radial connector



Proposed customer fitting

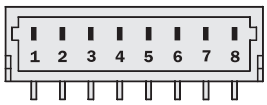


General tolerances according to DIN ISO 2768-mk

Pin and wire allocation

PIN	Signal	Colour of wires	Explanation
1	U_S	red	Supply voltage7 ... 12 V
2	+ SIN	white	Process data channel
3	REFSIN	brown	Process data channel
4	+ COS	pink	Process data channel
5	REFCOS	black	Process data channel
6	GND	blue	Ground connection
7	Data +	grey or yellow	RS485-parameter channel
8	Data –	green or purple	RS485-parameter channel

The GND-(0V) connection of the supply voltage has no connection to the housing.



Technische Daten nach DIN 32878		SEK/SEL37 radial connector	SEK	SEL
Number of sine/cosine periods per revolution		16	■	■
Number of the absolute ascertainable revolutions	Single SEK	1	■	
	Multi SEL	4,096		■
Dimensions		mm (see dimensional drawing)	■	■
Mass		0.04 kg	■	■
Moment of inertia to the rotor		1 gcm^2	■	■
Code type for the absolut value		Binary	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)		Increasing	■	■
Measurement step at interpolation of the sine/cosine signals with e. g. 12 bits		20 angular seconds	■	■
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 288 angular seconds	■	■
Non-linearity within a sine/cosine period				
differential non-linearity		± 144 angular seconds [1]	■	■
Working speed up to which the absolute position can be reliably produced		6,000 min^{-1}	■	■
Max. Operating speed	Single SEK and Multi SEL	12,000 min^{-1}	■	■
Max. angular acceleration		5 x 10^5 rad/s^2	■	■
Permissible shaft movement				
axial		± 0.3 mm	■	■
radial		± 0.15 mm	■	■
Working temperature range	Single SEK	– 40 ... + 115 °C	■	
	Multi SEL	– 20 ... + 115 °C		■
Storage temperature range [2]		– 50 ... + 125 °C	■	■
Permissible relative humidity		90 % [3]	■	■
Resistance				
To shocks [4]		100 g/10 ms	■	■
To vibration [5]		50 g/10 ... 2000 Hz	■	■
Protection class to IEC 60529 [6]		IP 20	■	■
EMC [7]			■	■
Operating voltage range		7 ... 12 V	■	■
Recommended supply voltage		8 V	■	■
Max. operating current, no load		< 50 mA	■	■
Available memory area				
within EEPROM 2048 [8]		1,792 bytes	■	■
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential	■	■
Parameter channel = RS 485		Digital	■	■

[1] At nominal position ± 0.1 mm

[2] Without packaging

[3] Condensation not permitted

[4] To EN 60068-2-27

[5] To EN 60068-2-6

[6] With mating connector inserted and closed cover

[7] To EN 61000-6-2 and EN 61000-6-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen.
Users must perform their own tests when other screen designs are used.

[8] If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.

Ordering information

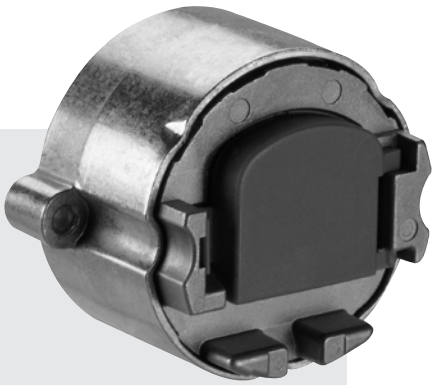
SEK/SEL37 radial connector

Type	Part no.	Description
SEK37-HFB0-K02	1037378	Single
SEL37-HFB0-K02	1037379	Multi

16 sine/ cosine periods

Motor Feedback System

- 16 sine/cosine periods per revolution
- 4,096 revolutions measurable (Multiturn)
- Programming of the positional value
- Electronic type lable

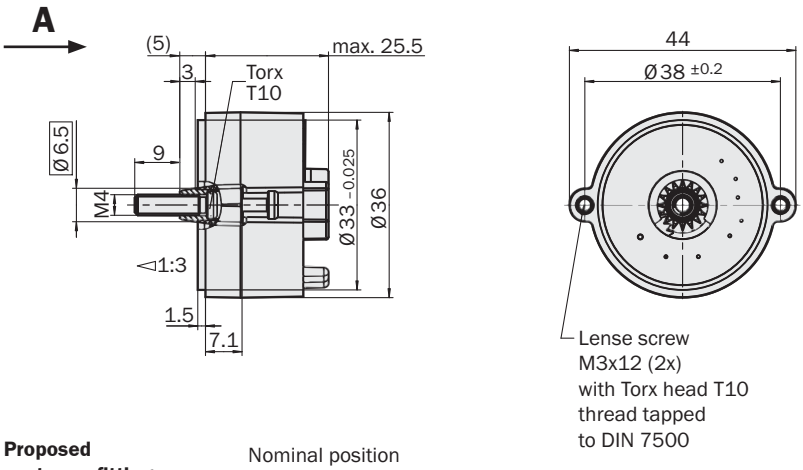


RoHS 2002/95/EC

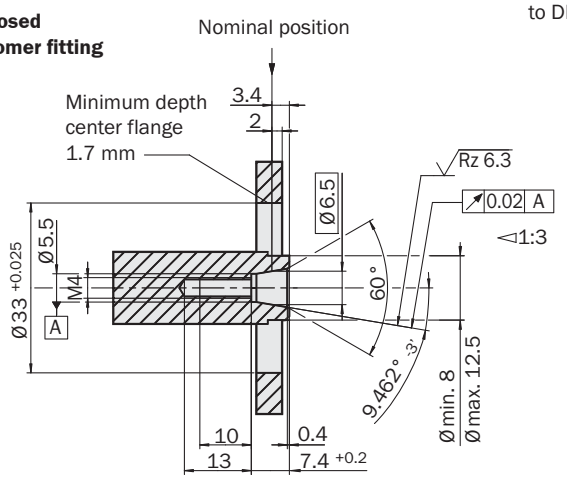
Accessories

- Connection systems
- Mounting systems
- Programming Tool

Dimensional drawing SEK/SEL37 axial connector



Proposed customer fitting

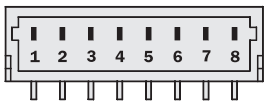


General tolerances according to DIN ISO 2768-mk

Pin and wire allocation

PIN	Signal	Colour of wires	Explanation
1	U_S	red	Supply voltage7 ... 12 V
2	+ SIN	white	Process data channel
3	REFSIN	brown	Process data channel
4	+ COS	pink	Process data channel
5	REFCOS	black	Process data channel
6	GND	blue	Ground connection
7	Data +	grey or yellow	RS485-parameter channel
8	Data –	green or purple	RS485-parameter channel

The GND-(0V) connection of the supply voltage has no connection to the housing.



Technische Daten nach DIN 32878		SEK/SEL37 axial connector	SEK	SEL
Number of sine/cosine periods per revolution		16	■	■
Number of the absolute ascertainable revolutions	Single SEK	1	■	
	Multi SEL	4,096		■
Dimensions		mm (see dimensional drawing)	■	■
Mass		0.05 kg	■	■
Moment of inertia to the rotor		1 gcm^2	■	■
Code type for the absolut value		Binary	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)		Increasing	■	■
Measurement step at interpolation of the sine/cosine signals with e. g. 12 bits		20 angular seconds	■	■
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 288 angular seconds	■	■
Non-linearity within a sine/cosine period				
differential non-linearity		± 144 angular seconds [1]	■	■
Working speed up to which the absolute position can be reliably produced		6,000 min^{-1}	■	■
Max. Operating speed	Single SEK and Multi SEL	12,000 min^{-1}	■	■
Max. angular acceleration		5 x 10^5 rad/s^2	■	■
Permissible shaft movement				
axial		± 0.3 mm	■	■
radial		± 0.15 mm	■	■
Working temperature range	Single SEK	– 40 ... + 115 °C	■	
	Multi SEL	– 20 ... + 115 °C		■
Storage temperature range [2]		– 50 ... + 125 °C	■	■
Permissible relative humidity		90 % [3]	■	■
Resistance				
To shocks [4]		100 g/10 ms	■	■
To vibration [5]		50 g/10 ... 2000 Hz	■	■
Protection class to IEC 60529 [6]		IP 40	■	■
EMC [7]			■	■
Operating voltage range		7 ... 12 V	■	■
Recommended supply voltage		8 V	■	■
Max. operating current, no load		< 50 mA	■	■
Available memory area				
within EEPROM 2048 [8]		1,792 bytes	■	■
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential	■	■
Parameter channel = RS 485		Digital	■	■

[1] At nominal position ± 0.1 mm

[2] Without packaging

[3] Condensation not permitted

[4] To EN 60068-2-27

[5] To EN 60068-2-6

[6] With mating connector inserted and closed cover

[7] To EN 61000-6-2 and EN 61000-6-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen.
Users must perform their own tests when other screen designs are used.

[8] If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.

Ordering information

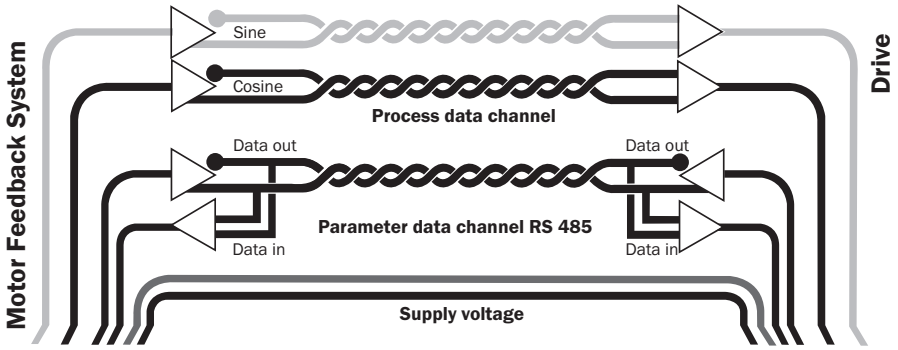
SEK/SEL37 axial connector

Type	Part no.	Description
SEK37-HFA0-K02	1037376	Single
SEL37-HFA0-K02	1037377	Multi

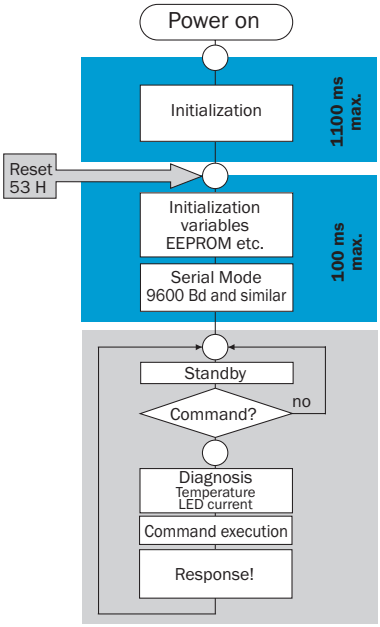
HIPERFACE® by SICK|STEGMANN

Electrical interface

- **Safe data transmission**
- **High information content**
- **Electronic type label**
- **Only 8 leads**
- **Bus-enabled parameter channel**
- **Process data channel in real time**



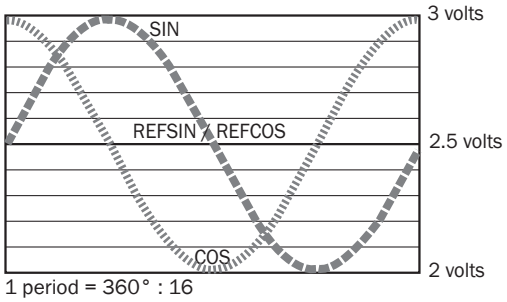
HIPERFACE® Starting time



CAUTION:
No **RS485 communication** is possible during the phases highlighted in blue

Signal specification of the process data channel

Signal diagram for clockwise rotation of the shaft, looking in direction "A"

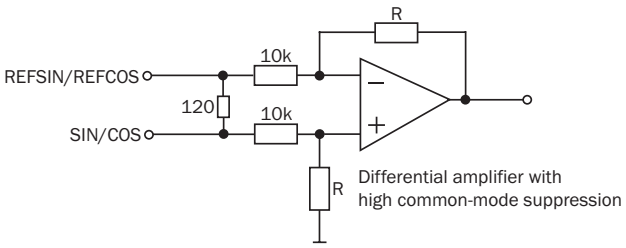


Access to the process data used for speed control, i.e. to the sine and cosine signals, is practically always "online". When the supply voltage is applied, the speed controller has access to this information at any time.

Sophisticated technology guarantees stable amplitudes of the analogue signals across all specified environmental conditions, with a maximum variation of only ± 20 %.

Characteristics applicable to all permissible environmental conditions	
Signal	**Value/Units**
Signal peak, peak V_{ss} of SIN, COS	0.8 ... 1.2 V
Signal offset REFSIN, REFCOS	2.2 ... 2.8 V

Recommended receiver circuit for sine and cosine signals



Further informations to the interface see HIPERFACE®-description part no. 8010701

HIPERFACE® by SICK|STEGMANN

Type-specific settings	SEK37/SEK52	SEL37/SEL52
Type ID (command 52h)	42h	47h
Free EEPROM [bytes]	1,792	1,792
Address	40h	40h
Mode_485 [1) 2)]	E4h	E4h
Codes 0 ... 3	55h	55h
Counter	0	0

Overview of commands supported			SEK37/SEK52	SEL37/SEL52
Command byte	Function	Code 0 [3)]	Comments	Comments
42h	Read position (5 bits per sine/cosine period)		9 bits	21 bits
43h	Set position	•		
44h	Read analogue value		Channel number F0h [4)] and 48h	Channel number F0h [4)] and 48h
			Temperature [°C]	Temperature [°C]
46h	Read counter			
47h	Increase counter			
49h	Reset counter	•		
4Ah	Read data			
4Bh	Save data			
4Ch	Determine status of a data field			
4Dh	Create data field			
4Eh	Determine available memory area			
4Fh	Change access code			
50h	Read encoder status			
52h	Read out name plate		Encoder type = 42h	Encoder type = 47h
53h	Encoder reset			
55h	Allocate encoder address	•		
56h	Read serial number and program version			

1) The baud rate 9600 is set by default. Other baud rates cannot be selected.

2) When using the motor feedback systems SEK|SEL37 and SEK|SEL52, please ensure that the controller's auto-baud function is not enabled, since these motor feedback systems compensate for minor variations when transmitting at a baud rate of 9600.

3) The commands thus labelled include the parameter "Code 0". Code 0 is a byte inserted into the protocol, for additional safeguarding of vital system parameters against accidental overwriting. When shipped, "Code 0" = 55h.

4) Temperature compatible with SCx (encoder temperature [°C] *2.048 – 40)

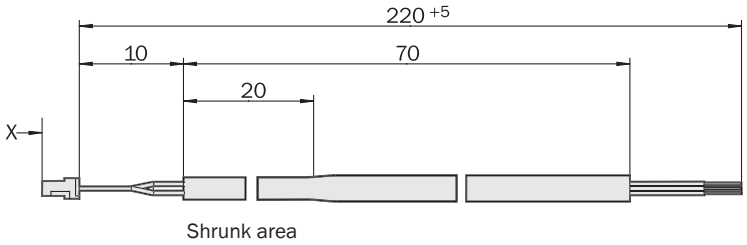
Overview of status messages				
Error type	Status code	Description	SEK37/52	SEL37/52
	00h	The encoder has recognised no error	•	•
Initialisation	01h	Faulty compensating data	•	•
	02h	Faulty internal angular offset	•	•
	03h	Data field partitioning table damaged	•	•
	04h	Analogue limit values not available	•	•
	05h	Internal I^2C bus not operational	•	•
	06h	Internal checksum error	•	•
Protocol	07h	Encoder reset occurred as a result of program monitoring	•	•
	09h	Parity error	•	•
	0Ah	Checksum of the data transmitted is incorrect	•	•
	0Bh	Unknown command code	•	•
	0Ch	Number of data transmitted is incorrect	•	•
	0Dh	Command argument transmitted is not allowed	•	•
Data	0Eh	The selected data field must not be written to	•	•
	0Fh	Incorrect access code	•	•
	10h	Size of data field stated cannot be changed	•	•
	11h	Word address stated, is outside data field	•	•
	12h	Access to non-existent data field	•	•
Position	1Fh	Speed too high, no position formation possible	•	•
	20h	Singleturn position unreliable	•	•
	21h	Positional error Multiturn		•
	22h	Positional error Multiturn		•
	23h	Positional error Multiturn		•
Other	1Ch	Monitoring the value of the analogue signals (process data)	•	•
	1Eh	Encoder temperature critical	•	•
	08h	Counter overflow	•	•

Further informations to the interface see HIPERFACE®-description part no. 8010701

Dimensional drawings and ordering information

Stranded cable/connector, straight, 8 wires, 8 x 0.15 mm²

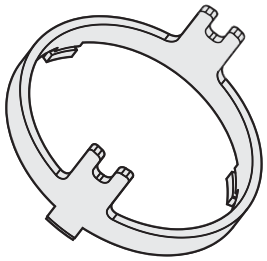
Type	Part no.	Contacts	Wire length
DOL-0J08-G0M2XB6	2031086	8	0.2 m



Shrunk area

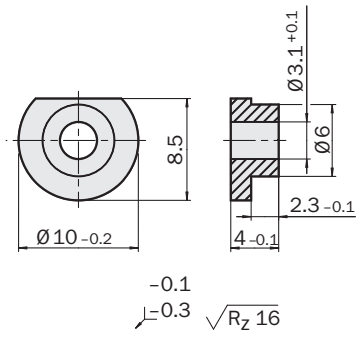
Assembly tool for SEK/SEL52 hollow shaft

Type	Part no.	Description
BEF-MW-SEY52	2048235	Assembly tool SEK/SEL52



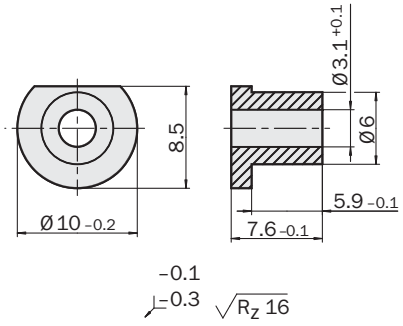
Servo clamp, Set (contents 3 off)

Type	Part no.	Description
BEF-WK-RESOL	2039082	Servo clamp for SEK/SEL52 (Hollow shaft and tapered shaft)



Servo clamp, Set (contents 3 off)

Type	Part no.	Description
BEF-WK-RESOL1	2048827	Servo clamp for SEK/SEL52 (Collar clamping)



Cable HIPERFACE®, 8 wires, per metre 4 x 2 x 0,15 mm²

Type	Part no.	Wires
LTG-2708-MW	6028361	8

Programming Tool for HIPERFACE® devices

Type	Part no.	Motor Feedback System
PGT-03-S	1034252	SEK/SEL37 and SEK/SEL52

Dimensional drawings and ordering information

Cover SEK/SEL52 with tapered shaft or collar clamping

Type	Part no.	Description
BEF-GA-SEY52BS1	2048234	Cover closed

Abdeckung SEK/SEL52 mit Hohlwelle

Type	Part no.	Description
BEF-GA-SEY52TS1	2048232	Cover opened

Contact:

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

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

Brasil
Phone +55 11 5091-4900
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 (0)2 11 53 01-250
E-Mail vzdinfo@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

Italia
Phone +39 011 797965
E-Mail stegmann@stegmann.it

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

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

Nederland
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

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 8 680 64 50
E-Mail info@sick.se

Taiwan
Phone +886 2 2365-6292
E-Mail sickgrc@ms6.hinet.net

USA
Phone +1 937-454-1956
E-Mail sales@stegmann.com

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

SICK | STEGMANN

SICK
6900 West 110th Street
Minneapolis, MN 55438
Ph: 800.325.SICK (7425) • Fax: 952.941.9287
www.sickusa.com

SICK STEGMANN, INC.
7496 Webster Street
Dayton, OH 45414
Ph: 800.811.9110 • Fax: 937.454.1955
www.stegmann.com

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