SinCos® SCK 25 to 53 and SCL 25 to 53: Motor Feedback Systems with HIPERFACE®-Interface

DATA SHEET

1,024 sine/ cosine periods

Motor Feedback Systems

HIPERFACE® by SICK|STEGMANN

SCK/SCL series motor feedback systems are used worldwide in many different applications and environments.

Absolute positioning with 16,384 steps per revolution and a maximum of 4,096 revolutions give a resolution of 27 bits.

Writing motor-specific data to the electronic type label and programming are important features of these series.

This allows you to put your individual motor feedback system together!

The advantages of the SinCos® SCK and SCL series, at a glance:

- for hollow shafts from 25 to 53 mm
- couplings, which would affect the accuracy and the dynamic behaviour of the drive, are not required
- no increase in torque through encoder ball bearings
- minimum mounting space since housings, couplings and bearings are not required.

SICK|STEGMANN

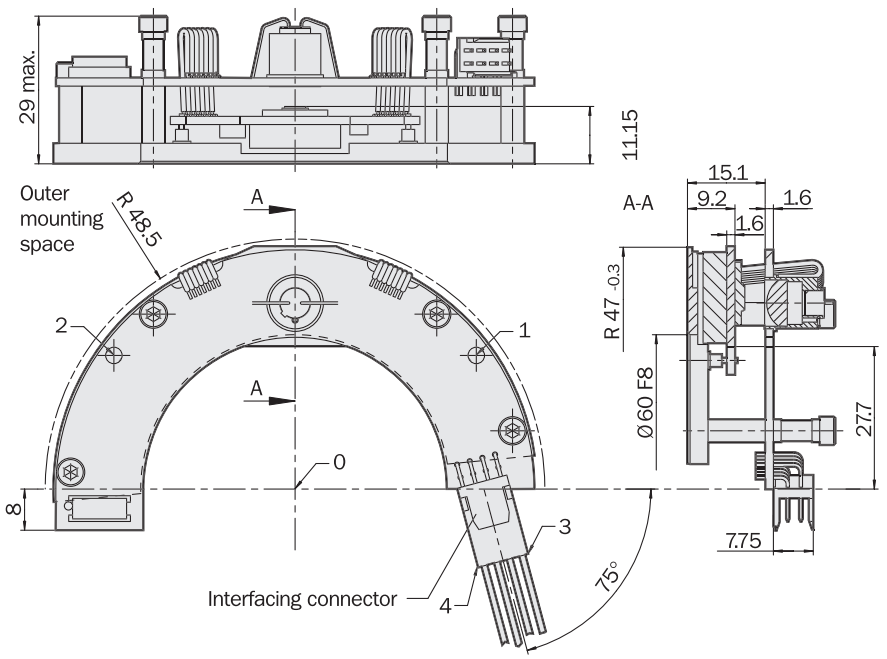
07-2005

1,024 sine/ cosine periods

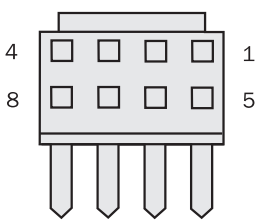
Motor Feedback Systems

- 1,024 sine/cosine periods per revolution
- Encoder temperature interrogation
- Programming of the positional value
- Electronic type label

Dimensional drawing SCK sensor block



General tolerances according to DIN ISO 2768-mk



View of the connector

Accessories

- Connection systems
- Shims
- Code discs
- Programming tool

PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	U_s	red	Supply voltage 7 … 12 V
2	GND	blue	Earth connection
3	REFSIN	brown	Process data channel
4	REFCOS	black	Process data channel
5	Data +	grey	RS-485-parameter channel
6	Data –	green	RS-485-parameter channel
7	+ SIN	white	Process data channel
8	+ COS	pink	Process data channel

Caution: To ensure proper function, the screen connection strand (200 mm) MUST be connected. It is included in the supply.

Technical Data	Code Discs **CHS** for Hollow Shaft Diameter (mm)	25	35	40	45	50	53
Number of sine/cosine periods per revolution	1,024	■	■	■	■	■	■
Dimensions	mm (see dimensional drawing)	■	■	■	■	■	■
Mass of the sensor block	50 g	■	■	■	■	■	■
Mass of the code disc complete	29 g	■					
	32 g		■				
	45 g			■			
	42 g				■		
	56 g					■	
	43 g						■
Moment of inertia of the code disc complete	160 g·cm²	■					
	197 g·cm²		■				
	300 g·cm²			■			
	305 g·cm²				■		
	440 g·cm²					■	
	370 g·cm²						■
Tightening torque for the code disc set screws	20 … 40 Ncm	■	■	■	■	■	■
Code type for the absolute value	Binary	■	■	■	■	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)	Increasing	■	■	■	■	■	■
Measurement step after generating arctan with 12 bit resolution	0.3 angular seconds	■	■	■	■	■	■
Total number of steps Singleturn	32,768	■	■	■	■	■	■
Error limits for the digital absolute value							
via RS 485 [1]	± 320 angular seconds	■	■	■	■	■	■
Error limits for evaluating the "1,024" signals,							
integral non-linearity [1]	± 180 angular seconds	■	■	■	■	■	■
Non-linearity within a sine/cosine period							
differential non-linearity	± 12 angular seconds	■	■	■	■	■	■
Output frequency for sine/cosine signals	0 … 200 kHz	■	■	■	■	■	■
Working speed up to which the absolute position can be reliably produced	6,000 min^{-1}	■	■	■	■	■	■
Max. operating speed	9,000 min^{-1}	■	■	■	■	■	■
Max. angular acceleration	0.2 x 10^6 rad/s^2	■	■	■	■	■	■
Permissible shaft movement							
radial dynamic	± 0.015 mm	■	■	■	■	■	■
axial dynamic	± 0.05 mm	■	■	■	■	■	■
Angular motion, perpendicular to the rotational axis							
static	± 0.005 mm/mm	■	■	■	■	■	■
dynamic	± 0.0025 mm/mm	■	■	■	■	■	■
Working temperature range	– 10 … + 100 °C	■	■	■	■	■	■
Storage temperature range	– 40 … + 125 °C	■	■	■	■	■	■
Permissible relative humidity [2]	90 %	■	■	■	■	■	■
Resistance							
to shocks [3]	70/10 g/ms	■	■	■	■	■	■
to vibration [4]	10/10 … 2000 g/Hz	■	■	■	■	■	■
Protection to IEC 60529 [5]	IP 00	■	■	■	■	■	■
EMC [6]		■	■	■	■	■	■
Operating voltage range	7 … 12 V	■	■	■	■	■	■
Recommended supply voltage	8 V	■	■	■	■	■	■
Max. operating current, no load	< 110 mA	■	■	■	■	■	■
Available memory area within EEPROM 512	128 bytes	■	■	■	■	■	■
Interface signals							
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential	■	■	■	■	■	■
Parameter channel = RS 485	Digital	■	■	■	■	■	■

[1] With a maximum runout of the code tracks of 0.06 mm.

[2] Condensation not permissible

[3] To DIN EN 60068-2-27

[4] To DIN EN 60068-2-6

[5] In assembled state

[6] To DIN EN 61000-2 and DIN EN 61000-3
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. This is also where the GND (0 V) connection of the supply voltage is linked to earth.
Users must perform their own tests when other screen designs are used.

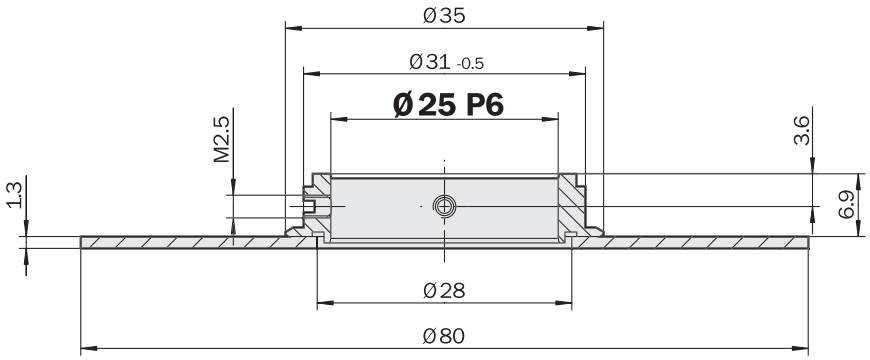
Ordering information see page 5

1,024 sine/ cosine periods

Motor Feedback Systems

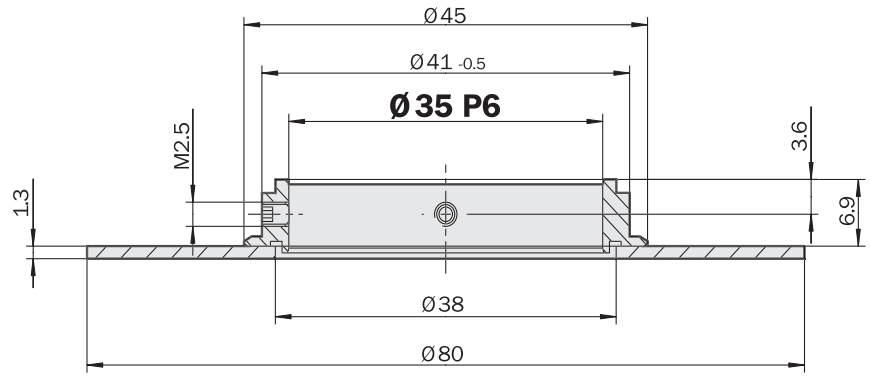
- 1,024 sine/cosine periods per revolution
- Encoder temperature interrogation
- Programming of the positional value
- Electronic type label

Dimensional drawing code disc with hub CH-H10-SCK 25 (CHS 25)



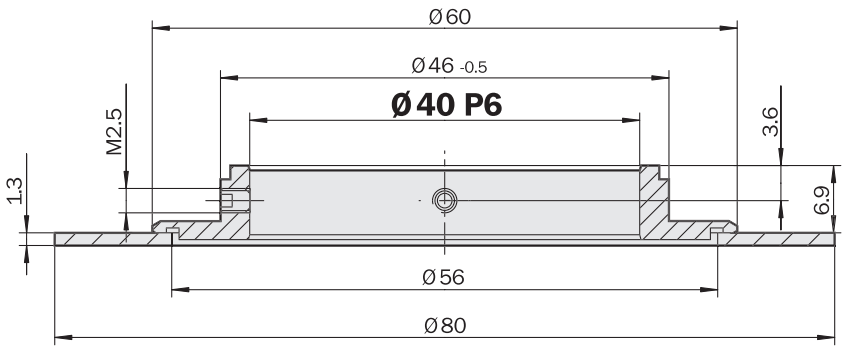
General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCK 35 (CHS 35)



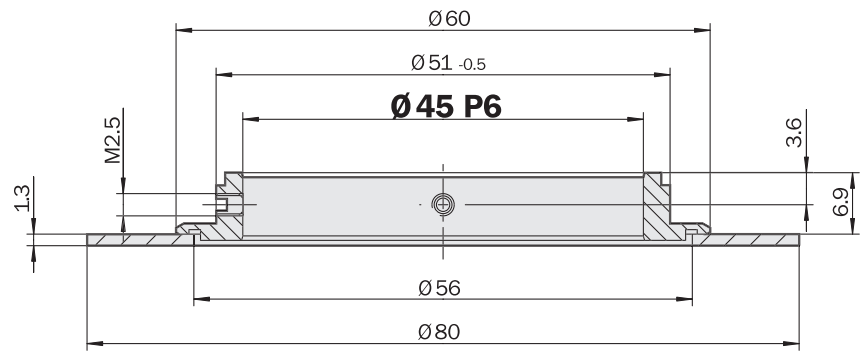
General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCK 40 (CHS 40)



General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCK 40 (CHS 40)

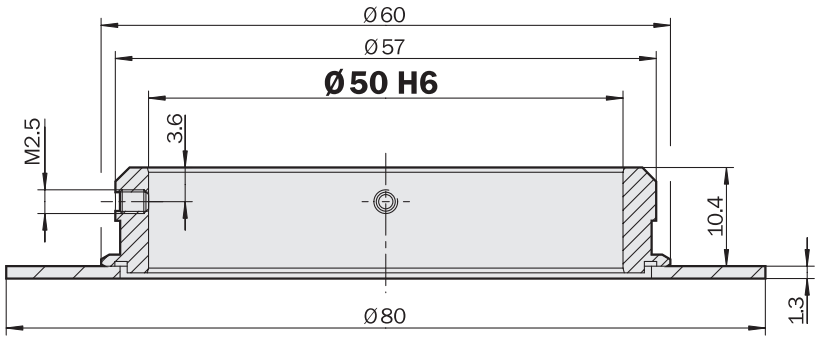


General tolerances according to DIN ISO 2768-mk

Accessories

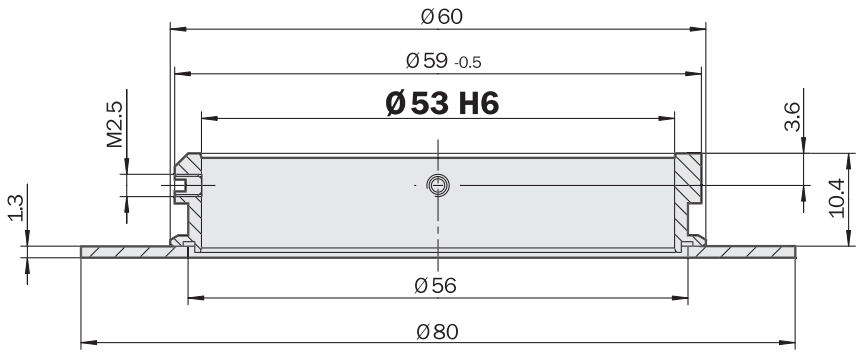
- Connection systems
- Shims
- Code discs
- Programming tool

Dimensional drawing code disc with hub CH-H10-SCK 50 (CHS 50)



General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCK 53 (CHS 53)



General tolerances according to DIN ISO 2768-mk

Ordering information		
SCK with hollow shaft diameter from 25 to 53 mm (complete unit)		
Type	**Part no.**	**Description**
SCK25-HDA0-K01	1 034 032	Singleturn, diameter 25 mm
SCK35-HDA0-K01	1 034 033	Singleturn, diameter 35 mm
SCK40-HDA0-K01	1 034 034	Singleturn, diameter 40 mm
SCK45-HDA0-K01	1 034 035	Singleturn, diameter 45 mm
SCK50-HDA0-K01	1 034 407	Singleturn, diameter 50 mm
SCK53-HDA0-K01	1 034 036	Singleturn, diameter 53 mm

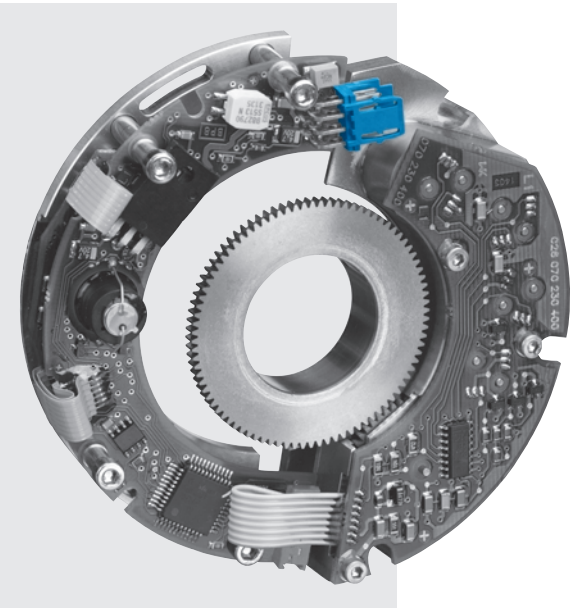
Ordering information		
Code discs with hub for sensor block SCK as accessories		
Type	**Part no.**	**Description**
CH-H10-SCK25	2 031 092	Code disc Ø 25 mm
CH-H10-SCK35	2 031 093	Code disc Ø 35 mm
CH-H10-SCK40	2 031 094	Code disc Ø 40 mm
CH-H10-SCK45	2 031 095	Code disc Ø 45 mm
CH-H10-SCK50	2 031 899	Code disc Ø 50 mm
CH-H10-SCK53	2 031 096	Code disc Ø 53 mm

Shims please order separately (see page 16).

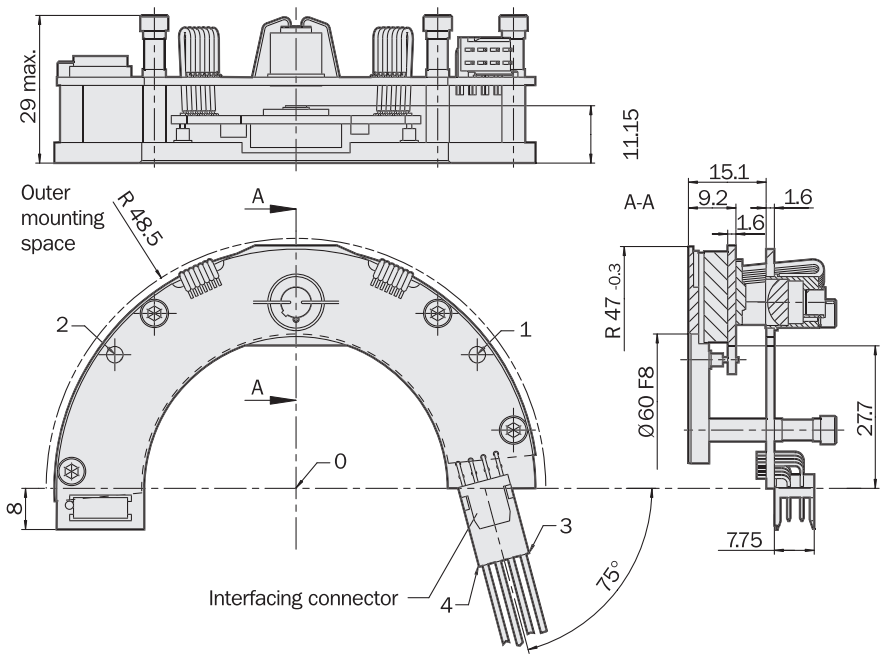
1,024 sine/ cosine periods

Motor Feedback Systems

- 1,024 sine/cosine periods per revolution
- 4,096 revolutions can be measured
- Encoder temperature interrogation
- Programming of the positional value
- Electronic type label

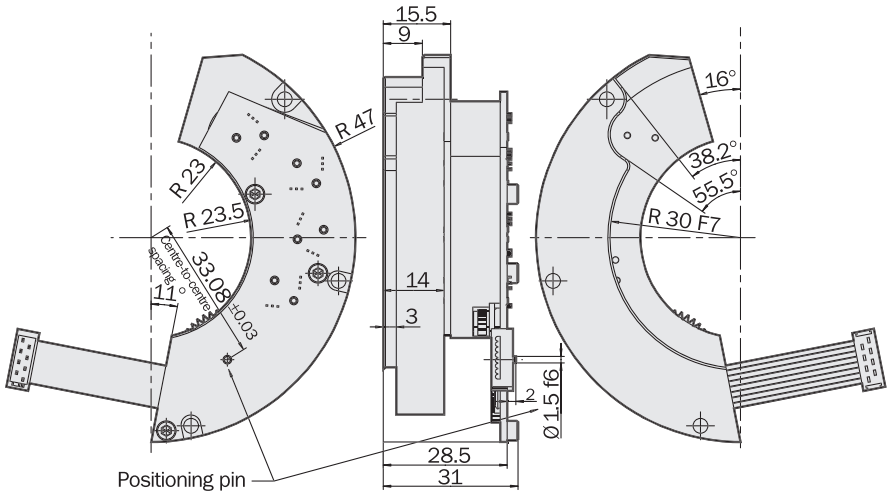


Dimensional drawing SCL sensor block

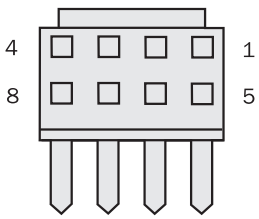


General tolerances according to DIN ISO 2768-mk

Dimensional drawing SCL gear box for SCL 25 and 35



General tolerances according to DIN ISO 2768-mk



View of the connector

PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	U_s	red	Supply voltage 7 … 12 V
2	GND	blue	Earth connection
3	REFSIN	brown	Process data channel
4	REFCOS	black	Process data channel
5	Data +	grey	RS-485-parameter channel
6	Data –	green	RS-485-parameter channel
7	+ SIN	white	Process data channel
8	+ COS	pink	Process data channel

Caution: To ensure proper function, the screen connection strand (200 mm) MUST be connected. It is included in the supply.

Accessories

- Connection systems
- Shims
- Code discs
- Programming tool

Technical Data	Code Discs **CHM** for Hollow Shaft Diameter (mm)	25	35
Number of sine/cosine periods per revolution	1,024		
Dimensions	mm (see dimensional drawing)		
Mass of the sensor block	50 g		
Mass of the gear box	182 g		
Mass of the code disc complete	58 g		
	52 g		
Moment of inertia of the code disc complete	246 g·cm^2		
	273 g·cm^2		
Tightening torque for the code disc set screws	20 … 40 Ncm		
Code type for the absolute value	Binary		
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)	Increasing		
Measurement step after generating arctan with 12 bit resolution	0.3 angular seconds		
Total number of steps Multiturn	32,768 x 4,096		
Error limits for the digital absolute value			
via RS 485 [1]	± 320 angular seconds		
Error limits for evaluating the "1,024" signals,			
integral non-linearity [1]	± 180 angular seconds		
Non-linearity within a sine/cosine period			
differential non-linearity	± 12 angular seconds		
Output frequency for sine/cosine signals	0 … 200 kHz		
Working speed up to which the absolute position can be reliably produced	6,000 min^{-1}		
Max. operating speed	6,000 min^{-1}		
Max. angular acceleration	0.2 x 10^6 rad/s^2		
Permissible shaft movement			
radial dynamic	± 0.015 mm		
axial dynamic	± 0.05 mm		
Angular motion, perpendicular to the rotational axis			
static	± 0.005 mm/mm		
dynamic	± 0.0025 mm/mm		
Working temperature range	– 10 … + 100 °C		
Storage temperature range	– 40 … + 110 °C		
Permissible relative humidity [2]	90 %		
Resistance			
to shocks [3]	70/10 g/ms		
to vibration [4]	10/10 … 2000 g/Hz		
Protection to IEC 60529 [5]	IP 00		
EMC [6]			
Operating voltage range	7 … 12 V		
Recommended supply voltage	8 V		
Max. operating current, no load	< 110 mA		
Available memory area within EEPROM 512	128 bytes		
Interface signals			
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential		
Parameter channel = RS 485	Digital		

[1] With a maximum runout of the code tracks of 0.06 mm.

[2] Condensation not permissible

[3] To DIN EN 60068-2-27

[4] To DIN EN 60068-2-6

[5] In assembled state

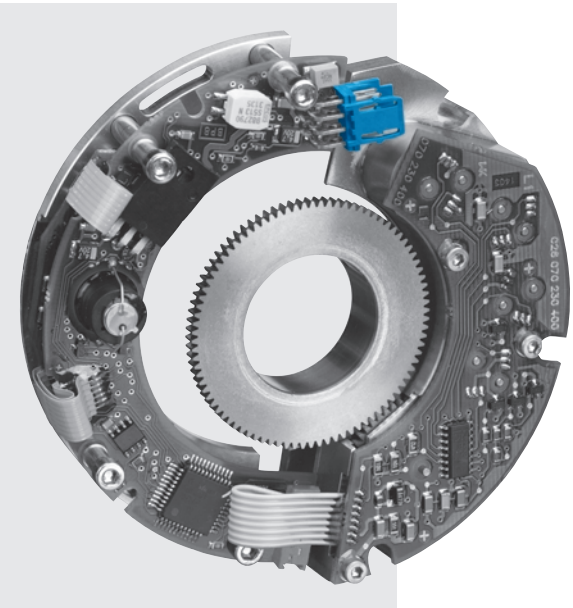
[6] To DIN EN 61000-2 and DIN EN 61000-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. This is also where the GND (0 V) connection of the supply voltage is linked to earth.
Users must perform their own tests when other screen designs are used.

Ordering information see page 10

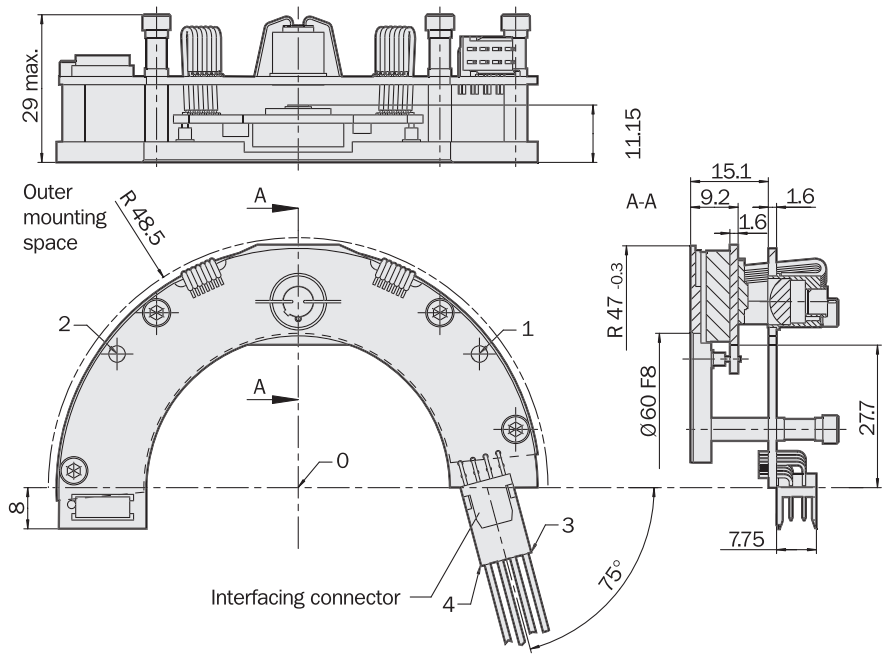
1,024 sine/ cosine periods

Motor Feedback Systems

- 1,024 sine/cosine periods per revolution
- 4,096 revolutions can be measured
- Encoder temperature interrogation
- Programming of the positional value
- Electronic type label

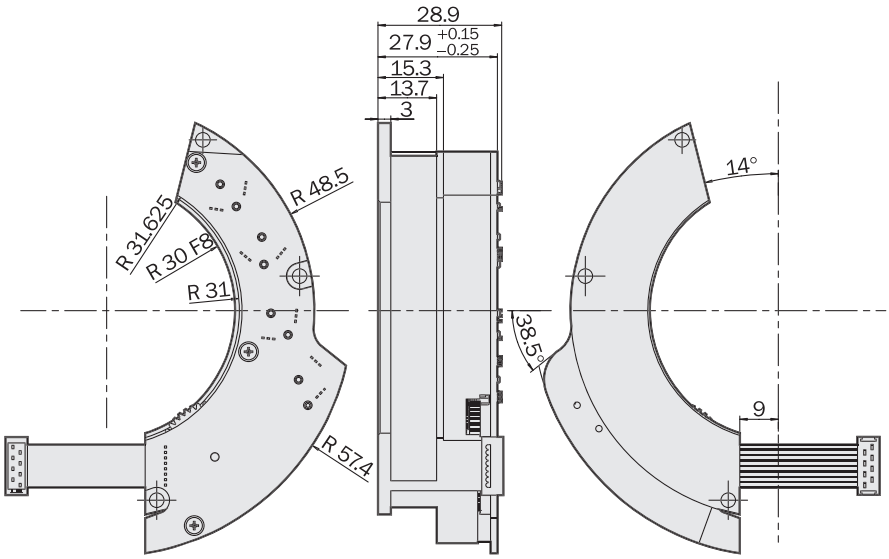


Dimensional drawing SCL sensor block

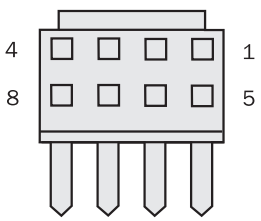


General tolerances according to DIN ISO 2768-mk

Dimensional drawing SCL gear box for SCL 40, 45, 50 and 53



General tolerances according to DIN ISO 2768-mk



View of the connector

PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	U_s	red	Supply voltage 7 … 12 V
2	GND	blue	Earth connection
3	REFSIN	brown	Process data channel
4	REFCOS	black	Process data channel
5	Data +	grey	RS-485-parameter channel
6	Data –	green	RS-485-parameter channel
7	+ SIN	white	Process data channel
8	+ COS	pink	Process data channel

Caution: To ensure proper function, the screen connection strand (200 mm) MUST be connected. It is included in the supply.

Accessories

- Connection systems
- Shims
- Code discs
- Programming tool

Technical Data Code Discs **CHM** for Hollow Shaft Diameter (mm)		40	45	50	53
Number of sine/cosine periods per revolution	1,024	■	■	■	■
Dimensions	mm (see dimensional drawing)	■	■	■	■
Mass of the sensor block	50 g	■	■	■	■
Mass of the gear box	270 g	■	■	■	■
Mass of the code disc complete	75 g	■			
	68 g		■		
	64 g			■	
	52 g				■
Moment of inertia of the code disc complete	475 g·cm²	■			
	485 g·cm²		■		
	510 g·cm²			■	
	440 g·cm²				■
Tightening torque for the code disc set screws	20 … 40 Ncm	■	■	■	■
Code type for the absolute value	Binary	■	■	■	■
Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)	Increasing	■	■	■	■
Measurement step after generating arctan with 12 bit resolution	0.3 angular seconds	■	■	■	■
Total number of steps Multiturn	32,768 x 4,096	■	■	■	■
Error limits for the digital absolute value					
via RS 485 [1]	± 320 angular seconds	■	■	■	■
Error limits for evaluating the "1,024" signals,					
integral non-linearity [1]	± 180 angular seconds	■	■	■	■
Non-linearity within a sine/cosine period					
differential non-linearity	± 12 angular seconds	■	■	■	■
Output frequency for sine/cosine signals	0 … 200 kHz	■	■	■	■
Working speed up to which the absolute position can be reliably produced	6,000 min^{-1}	■	■	■	■
Max. operating speed	5,000 min^{-1}	■	■	■	■
Max. angular acceleration	0.2 x 10^6 rad/s²	■	■	■	■
Permissible shaft movement					
radial dynamic	± 0.015 mm	■	■	■	■
axial dynamic	± 0.05 mm	■	■	■	■
Angular motion, perpendicular to the rotational axis					
static	± 0.005 mm/mm	■	■	■	■
dynamic	± 0.0025 mm/mm	■	■	■	■
Working temperature range	– 10 … + 100 °C	■	■	■	■
Storage temperature range	– 40 … + 110 °C	■	■	■	■
Permissible relative humidity [2]	90 %	■	■	■	■
Resistance					
to shocks [3]	70/10 g/ms	■	■	■	■
to vibration [4]	10/10 … 2000 g/Hz	■	■	■	■
Protection to IEC 60529 [5]	IP 00	■	■	■	■
EMC [6]		■	■	■	■
Operating voltage range	7 … 12 V	■	■	■	■
Recommended supply voltage	8 V	■	■	■	■
Max. operating current, no load	< 110 mA	■	■	■	■
Available memory area within EEPROM 512	128 bytes	■	■	■	■
Interface signals					
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential	■	■	■	■
Parameter channel = RS 485	Digital	■	■	■	■

[1] With a maximum runout of the code tracks of 0.06 mm.

[2] Condensation not permissible

[3] To DIN EN 60068-2-27

[4] To DIN EN 60068-2-6

[5] In assembled state

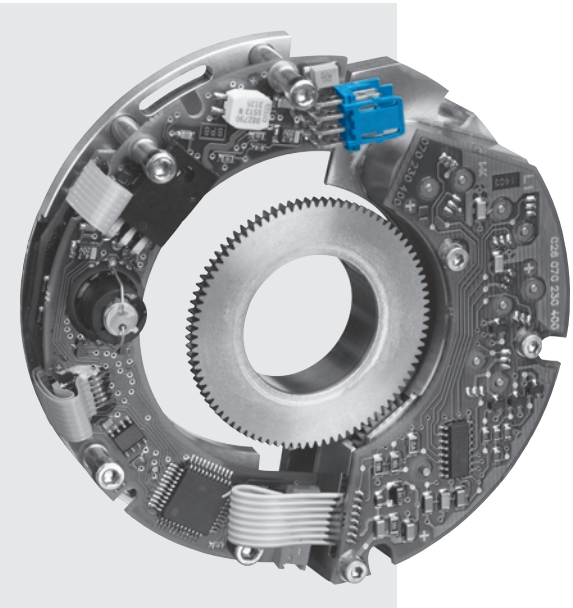
[6] To DIN EN 61000-2 and DIN EN 61000-3
The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. This is also where the GND (0 V) connection of the supply voltage is linked to earth.
Users must perform their own tests when other screen designs are used.

Ordering information see page 10

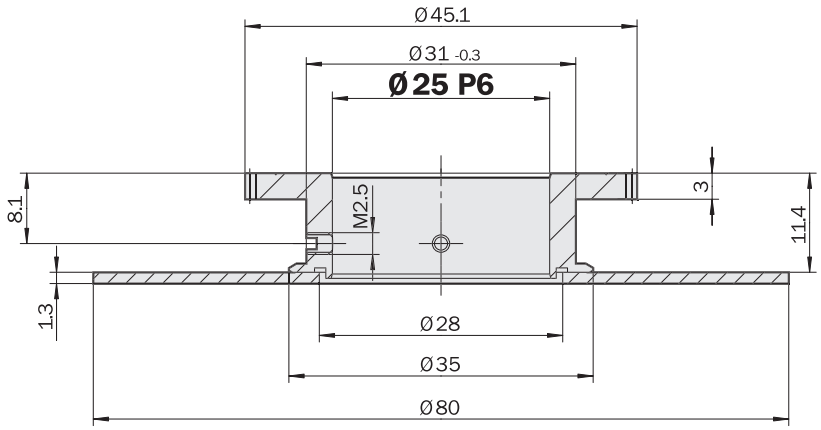
1,024 sine/ cosine periods

Motor Feedback Systems

- 1,024 sine/cosine periods per revolution
- 4,096 revolutions can be measured
- Encoder temperature interrogation
- Programming of the positional value
- Electronic type label

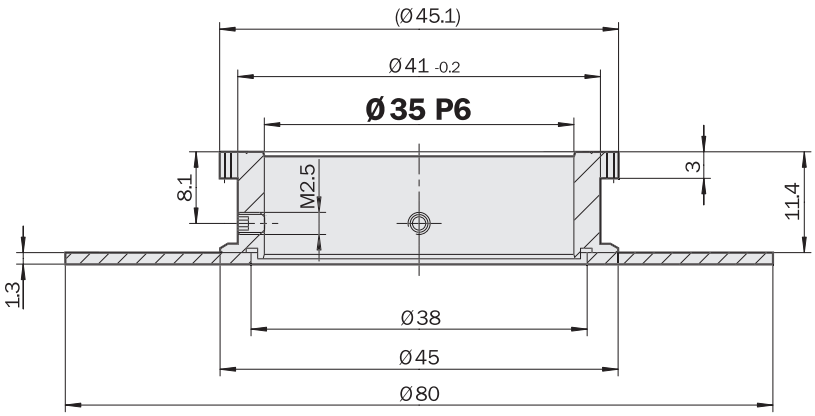


Dimensional drawing code disc with hub CH-H10-SCL25 (CHM 25)



General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCL35 (CHM 35)



General tolerances according to DIN ISO 2768-mk

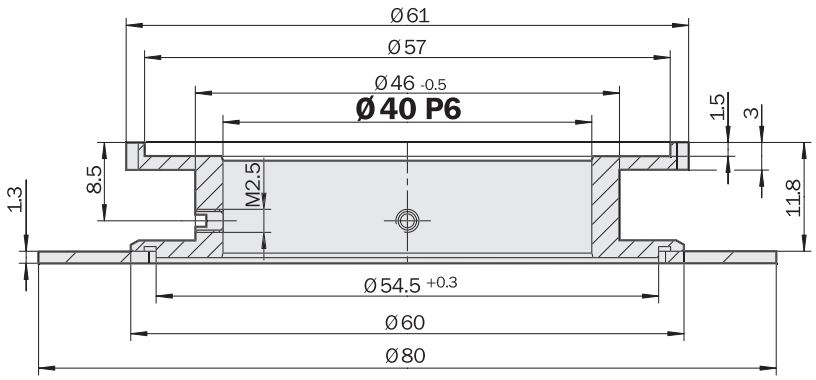
Ordering information		
SCL with hollow shaft diameter from 25 to 53 mm (complete unit)		
Type	**Part no.**	**Description**
SCL25-HDA0-K01	1 034 037	Multiturn, diameter 25 mm
SCL35-HDA0-K01	1 034 038	Multiturn, diameter 35 mm
SCL40-HDA0-K01	1 034 235	Multiturn, diameter 40 mm
SCL45-HDA0-K01	1 034 236	Multiturn, diameter 45 mm
SCL50-HDA0-K01	1 034 406	Multiturn, diameter 50 mm
SCL53-HDA0-K01	1 034 237	Multiturn, diameter 53 mm

Ordering information		
Code discs with hub for sensor block SCL as accessories		
Type	**Part no.**	**Description**
CH-H10-SCL25	2 031 097	Code disc Ø 25 mm
CH-H10-SCL35	2 031 098	Code disc Ø 35 mm
CH-H10-SCL40	2 031 099	Code disc Ø 40 mm
CH-H10-SCL45	2 031 100	Code disc Ø 45 mm
CH-H10-SCL50	2 031 898	Code disc Ø 50 mm
CH-H10-SCL53	2 031 101	Code disc Ø 53 mm

Shims please order separately (see page 16).

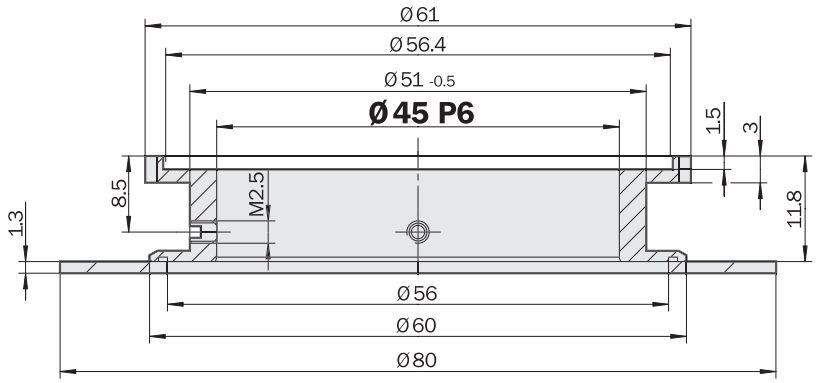
Accessories
Connection systems
Shims
Code discs
Programming tool

Dimensional drawing code disc with hub CH-H10-SCL40 (CHM 40)



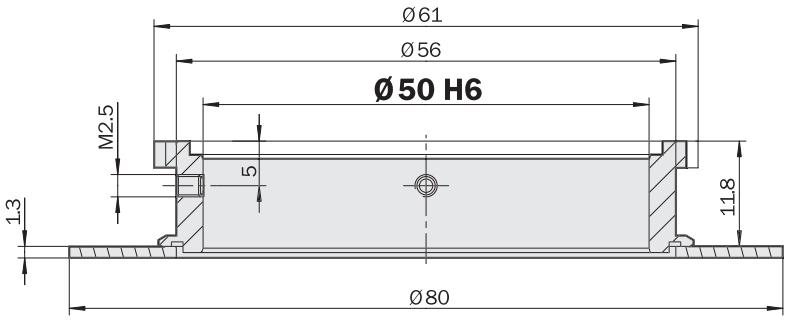
General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCL45 (CHM 45)



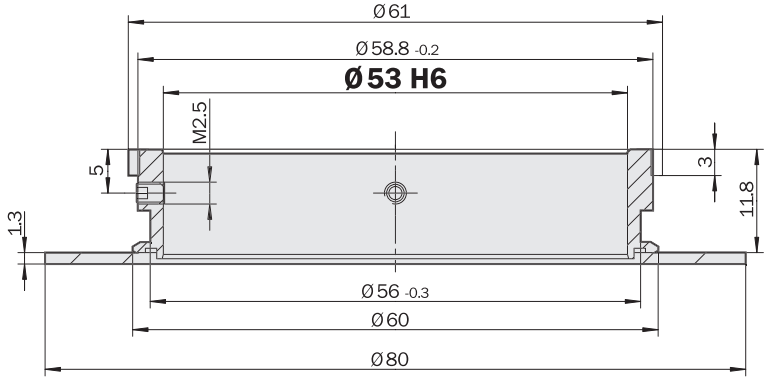
General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCL50 (CHM 50)



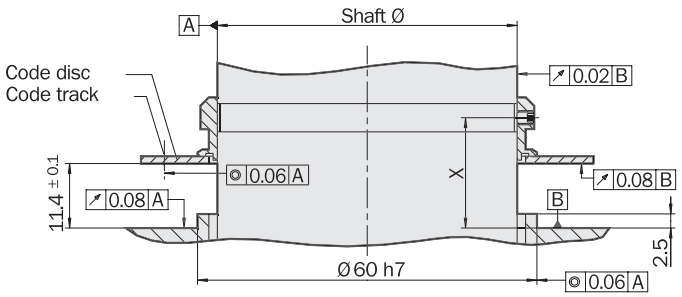
General tolerances according to DIN ISO 2768-mk

Dimensional drawing code disc with hub CH-H10-SCL53 (CHM 53)

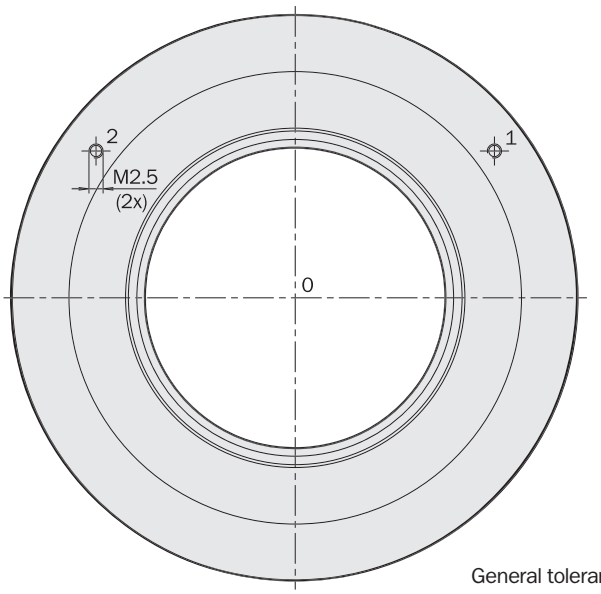


General tolerances according to DIN ISO 2768-mk

Dimensional drawing sensor block with code discs CH-H10-SCK 25 to 53



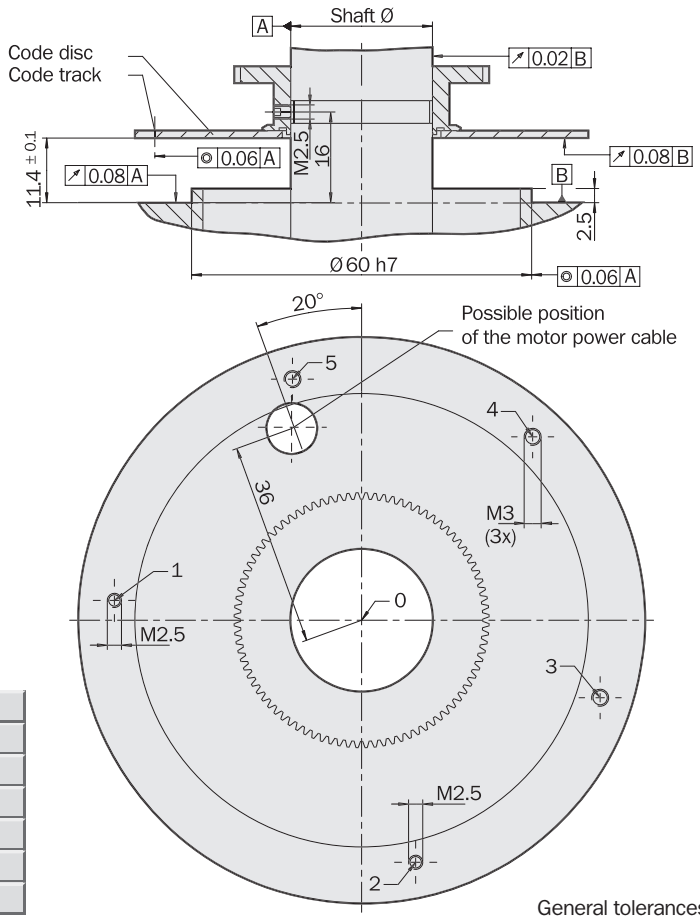
Pos.	X ± 0.05	Y ± 0.05
0	0.000	0.000
1	32.218	25.957
2	– 35.218	25.957



Shaft-Ø	X [mm]
25 e6	16
35 e6	16
40 e6	16
45 e6	16
50 g6	19.5
53 g6	19.5

General tolerances according to DIN ISO 2768-mk

Dimensional drawing sensor block and gear box SCL 25 and 35 with code discs CH-H10-SCL25 and CH-H10-SCL35

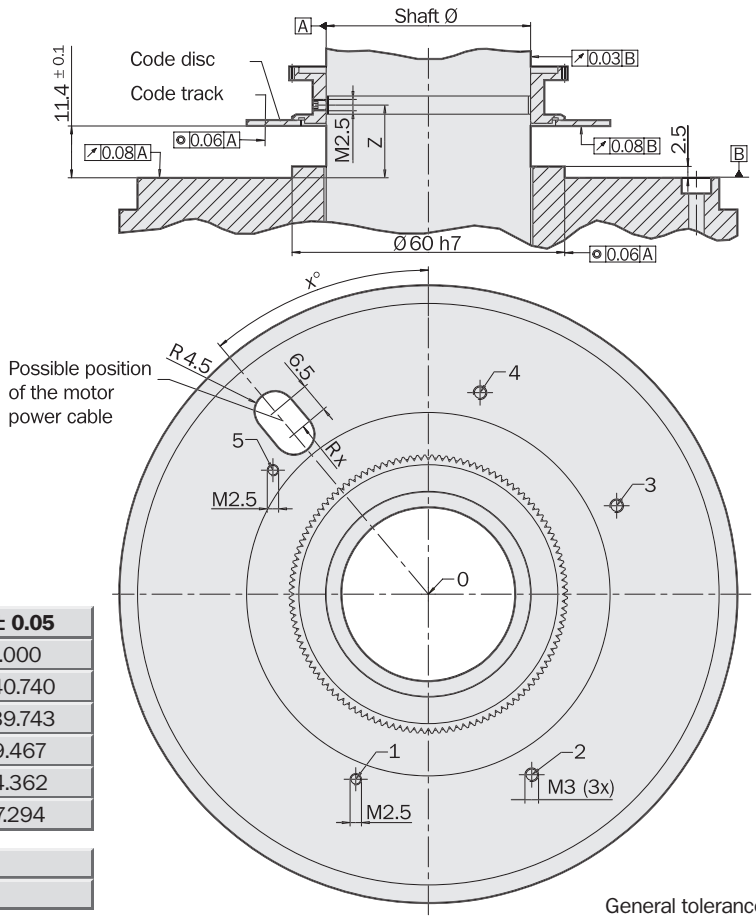


Pos.	X ± 0.05	Y ± 0.05
0	0.000	0.000
1	– 43.619	3.502
2	9.538	– 42.707
3	42.084	– 13.674
4	30.178	32.362
5	– 12.197	42.536

Shaft-Ø
25 e6
35 e6

General tolerances according to DIN ISO 2768-mk

Dimensional drawing sensor block and gear box SCL 40, SCL 45 and SCL 53 with code discs CH-H10-SCL40, CH-H10-SCL45, CH-H10-SCL50, CH-H10-SCL53



Pos.	X ± 0.05	Y ± 0.05
0	0.000	0.000
1	– 15.974	– 40.740
2	22.762	– 39.743
3	41.457	19.467
4	11.387	44.362
5	– 34.204	27.294

x	40°
Rx	R46

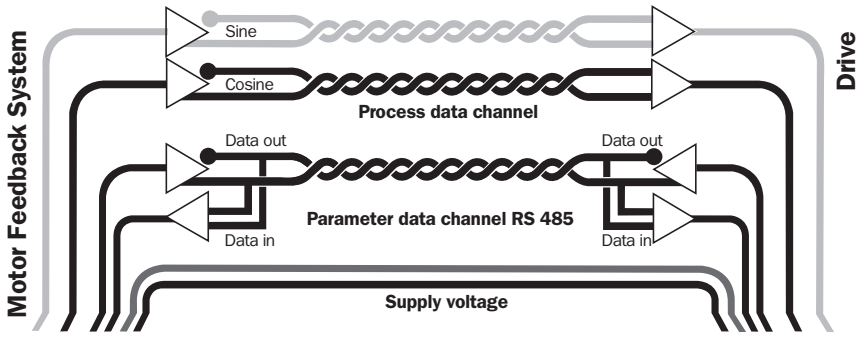
Shaft-Ø	Z [mm]
40 e6	16
45 e6	16
50 g6	19.5
53 g6	19.5

General tolerances according to DIN ISO 2768-mk

HIPERFACE® by SICK|STEGMANN

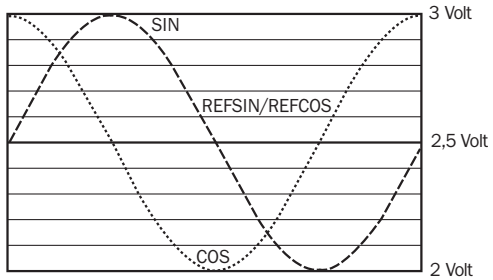
Electrical interface

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



Signal specification of the process data channel

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



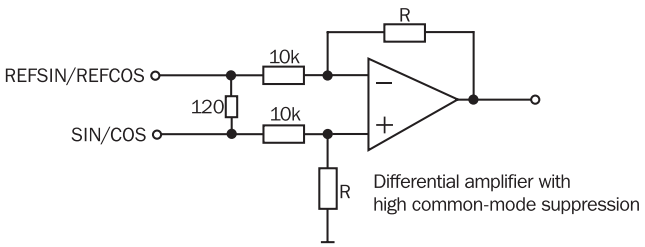
1 period = 360° : 1,024

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.

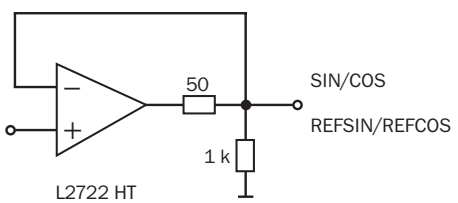
Sophisticated technology guarantees stable amplitudes of the analogue signals across all specified environmental conditions, with a maximum variation of only 20%.

Characteristics applicable to all environmental conditions stated	
Signal	**Values/Units**
Signal peak, peak $V_{p\text{-}t\text{-}p}$ of SIN, COS	0.9 ... 1.1 V
Signal offset REFSIN, REFCOS	2.2 ... 2.8 V

Recommended receiver circuit for sine and cosine signals



The output circuit of the process data channel within the SinCos encoder



HIPERFACE® by SICK|STEGMANN

Type-specific settings	SCK	SCL
Type ID (command 52h)	22h	27h
Free EEPROM [bytes]	128	128
Address	40h	40h
Mode_485	E4h	E4h
Codes 0 … 3	55h	55h
Counter	0	0

Overview of commands supported			SCK	SCL
Command byte	Function	Code 0 [1]	Comments	Comments
42h	Read Position			
43h	Set Position	•		
44h	Read analogue value		Channel number F0h	Channel number F0h
			Temperature [°C] [2]	Temperature [°C] [2]
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 rating plate		Encoder type = 22h	Encoder type = 27h
53h	Encoder reset			
55h	Allocate encoder address	•		
56h	Read serial number and program version			
57h	Configure serial interface	•		
63h	Internal synchronisation and position setting	•		

[1] 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.

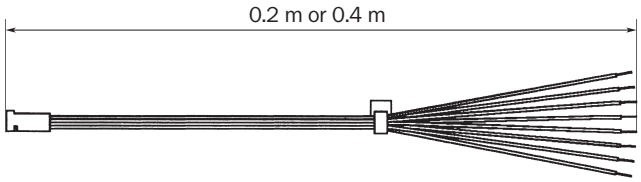
[2] Encoder temperature = $\frac{\text{Digital value} + 40}{2{,}048}$

Overview of status messages				
Error type	Status code	Description	SCK	SCL
	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	01h	Analogue signals outside specification	•	•
	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)	•	•
	1Dh	Transmitter current critical (dirt, transmitter breakage)	•	•
	1Eh	Encoder temperature critical	•	•
	08h	Counter overflow	•	•

Dimensional drawing and ordering information

Stranded cable, straight, 8 wires, 8 x 0.24 mm²

Type	Part no.	Contacts	Wire length
DOL-0B08-G0M2XB1	2 031 081	8	0.2 m
DOL-0B08-G0M4XB1	2 031 083	8	0.4 m



General tolerances according to DIN ISO 2768-mk

Shims

Type	Part no.	Description
BEF-MW-SCXKIT	2 031 080	Set (2 off)

Code discs

Code disc with hub for sensor block SCK

Type	Part no.	Description
CH-H10-SCK25	2 031 092	Code disc Ø 25 mm
CH-H10-SCK35	2 031 093	Code disc Ø 35 mm
CH-H10-SCK40	2 031 094	Code disc Ø 40 mm
CH-H10-SCK45	2 031 095	Code disc Ø 45 mm
CH-H10-SCK50	2 031 899	Code disc Ø 50 mm
CH-H10-SCK53	2 031 096	Code disc Ø 53 mm

Code disc with hub for sensor block SCL

Type	Part no.	Description
CH-H10-SCL25	2 031 097	Code disc Ø 25 mm
CH-H10-SCL35	2 031 098	Code disc Ø 35 mm
CH-H10-SCL40	2 031 099	Code disc Ø 40 mm
CH-H10-SCL45	2 031 100	Code disc Ø 45 mm
CH-H10-SCL50	2 031 898	Code disc Ø 50 mm
CH-H10-SCL53	2 031 101	Code disc Ø 53 mm

Dimensional drawing and ordering information

HIPERFACE® cable 8 core, supplied by the metre 4 x 2 x 0,15 mm², screened, flexible

Type	Part no.	Wires
LTG-2708-MW	6 028 361	8

Programming tool for HIPERFACE®-devices

Type	Part no.	Motor Feedback System
PGT-03-S	1 034 252	SCK and SCL

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