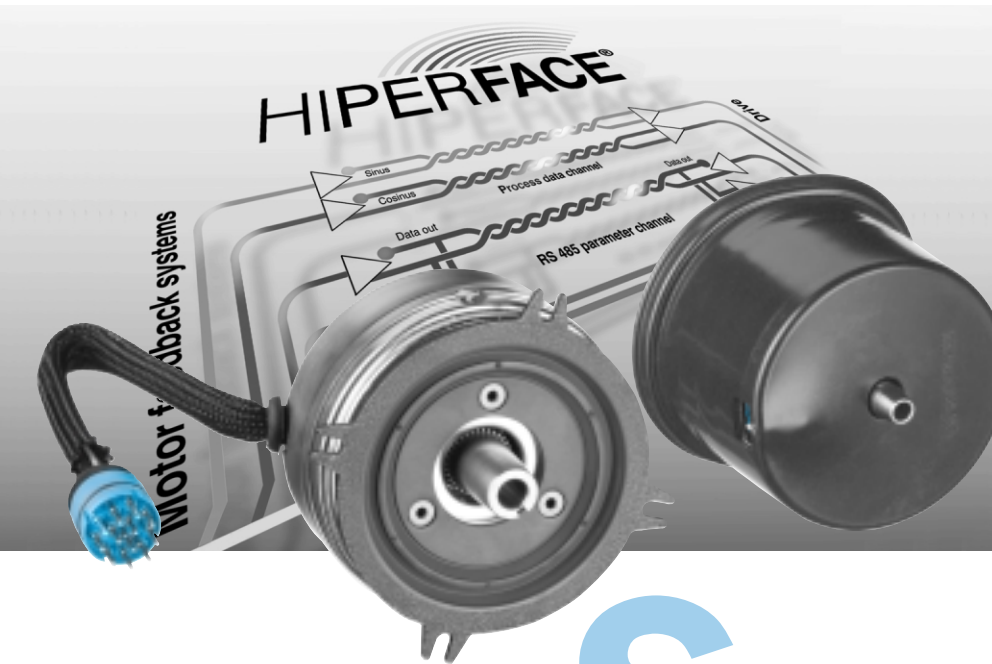


SinCos[®] SCS 60, SCM 60, SCS 70, SCM 70: Motor Feedback Systems with HIPERFACE[®] - Interface for Servo Motors



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

Select the motor feedback system to suit your individual requirement.

Possible product variations:

- Plug-in shaft, tapered shaft or hollow shaft with different stator supports
- 6 mm or 10 mm shaft with connector or cable exit
- Versions for integration, attachment, or standalone versions.

	512 sine/ cosine periods
Motor Feedback Systems	



SCS/SCM series of motor feedback systems are used worldwide in many different applications and environments.

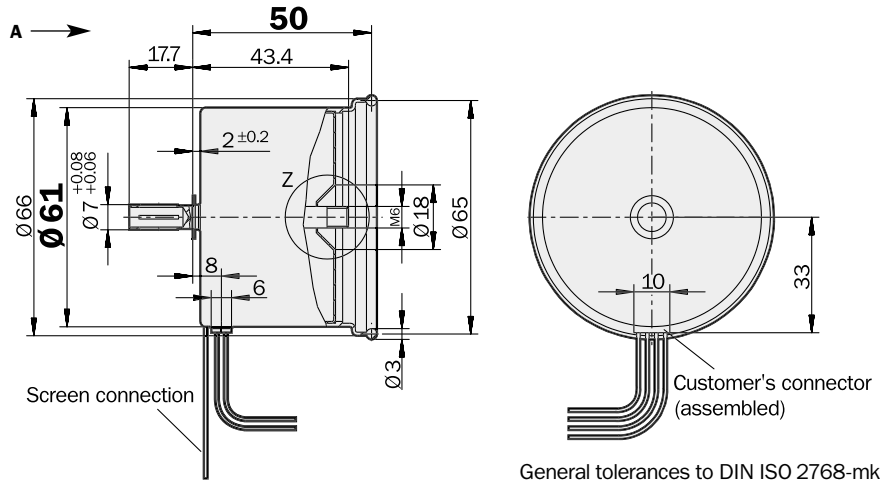
Absolute positioning with 16,384 steps per revolution and a maximum of 4,096 revolutions give a total resolution of 67,108,864 steps.

512 sine/cosine periods

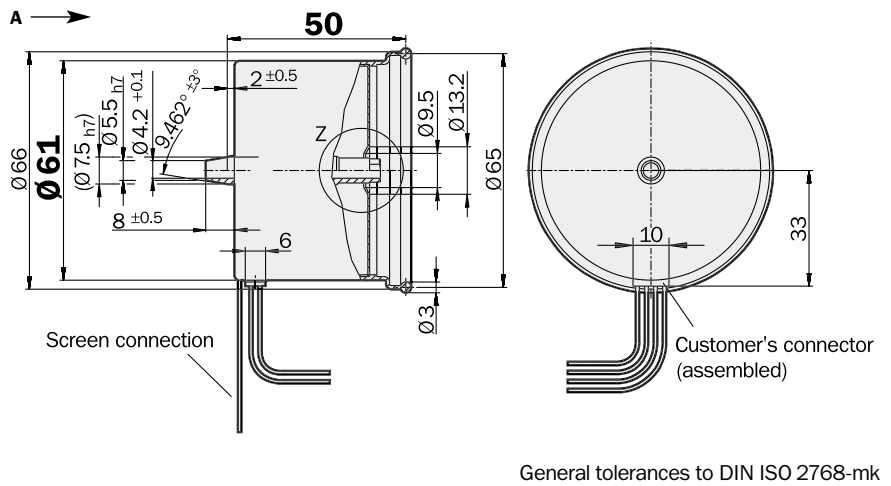
Motorfeedback-Systeme

- 512 sine/cosine periods per revolution
- Absolute position with a resolution of 16,384 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SCS/SCM 60, plug-in shaft



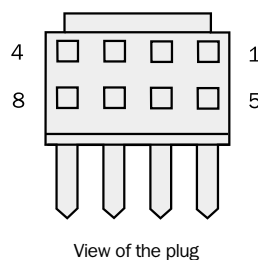
Dimensional drawing SCS/SCM 60, tapered shaft



PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	U _s	red	Supply voltage 7 ... 12 V
2	GND	blue	Ground 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 technology
Fixing technology
Programming tool

Technical Data			Plug-in Shaft and Tapered Shaft SCS/SCM 60											
			SCS	SCM										
Number of sine/cosine periods per revolution	512													
Dimensions	mm (see dimensional drawing)													
Mass	0.25 kg													
Inertial rotor moment	20 gcm ²													
Type of code 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	0.6 angular seconds													
Total number of steps	Single SCS	16,384												
	Multi SCM	67,108,864 = 16,384 x 4,096												
Error limits for the digital absolute value														
via RS 485		± 180 angular seconds												
Error limits for evaluating the "512" signals,														
integral non-linearity		± 40 angular seconds												
Non-linearity within a sine/cosine period														
differential non-linearity		± 18 angular seconds												
Output frequency for sine/cosine signals		0 ... 100 kHz												
Working speed up to which the absolute position can be reliably produced		6,000 min ⁻¹												
Max. operating speed		12,000 min ⁻¹												
Max. angular acceleration		5 x 10 ⁵ rad/s ²												
Operating torque		0.1 Ncm												
Starting torque		0.2 Ncm												
Permissible shaft movement														
statisch	radial/axial	± 0.5 mm/± 0.75 mm												
dynamisch	radial/axial	± 0.1 mm/± 0.25 mm												
Angular motion, perpendicular to the rotational axis														
static		± 0.005 mm/mm												
dynamic		± 0.0025 mm/mm												
Life of ball bearings		3.6 x 10 ⁹ revolutions												
Working temperature range		- 20 ... + 115 °C												
Storage temperature range		- 40 ... + 125 °C												
Permissible relative humidity ⁴⁾		90 %												
Resistance														
to shocks ²⁾		85/6 g/ms												
to vibration ³⁾		20/10 ... 2000 g/Hz												
Protection to IEC 60529 ⁴⁾		IP 40												
EMC ⁵⁾														
Operating voltage range		7 ... 12 V												
Recommended supply voltage		8 V												
Max. operating current, no load		100 ... 130 mA												
Available memory area within EEPROM		128 bytes												
Interface signals														
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential													
Parameter channel = RS 485	Digital													

⁴⁾ Condensation not permissible

²⁾ To DIN EN 60068-2-27

³⁾ To DIN EN 60068-2-6

⁴⁾ In assembled state

⁵⁾ 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

SCS/SCM 60 plug-in shaft and tapered shaft

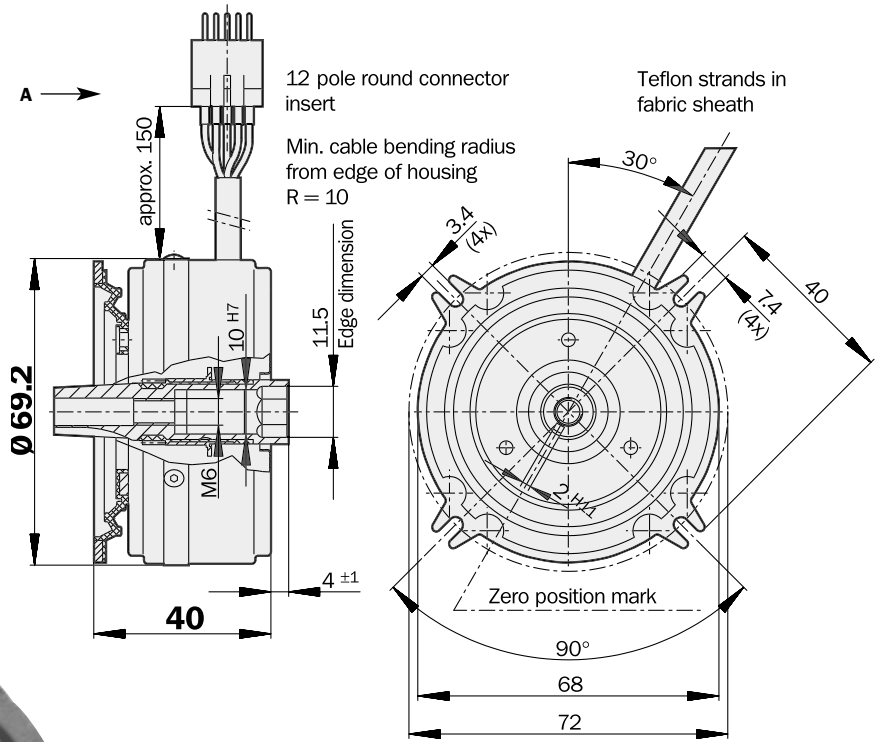
Type	Part no.	Description
SCS60-HAA0-K01	1 034 063	Single, plug-in shaft, connector
SCM60-HAA0-K01	1 034 040	Multi, plug-in shaft, connector
SCS60-HEA0-K01	1 034 066	Single, tapered shaft, connector
SCM60-HEA0-K01	1 034 042	Multi, tapered shaft, connector

512 sine/cosine periods

Motor Feedback Systems

- 512 sine/cosine periods per revolution
- Absolute position with a resolution of 16,384 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SCS/SCM 70, tapered shaft, version for integration



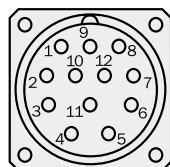
Preset (default)
zero position is 180° opposite the cable exit

General tolerances to DIN ISO 2768-mk



PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	REFCOS	black	Process data channel
2	Data +	grey	RS-485-parameter channel
3	N. C.	–	N. C.
4	N. C.	–	N. C.
5	SIN	white	Process data channel
6	REFSIN	brown	Process data channel
7	Data –	green	RS-485-parameter channel
8	COS	pink	Process data channel
9	Screen	–	Screen connection
10	GND	blue	Ground connection
11	N. C.	–	N. C.
12	U _s	red	Supply voltage 7 ... 12 V



View of the plug-in face

N. C. = Not Connected

Accessories

Connection technology
Fixing technology
Programming tool

Technical Data			Tapered Shaft, Version for Integration SCS/SCM 70											
			SCS	SCM										
Number of sine/cosine periods per revolution		512												
Dimensions		mm (see dimensional drawing)												
Mass		0.30 kg												
Inertial rotor moment		20 gcm ²												
Type of code 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		0.6 angular seconds												
Total number of steps	Single SCS	16,384												
	Multi SCM	67,108,864 = 16,384 x 4,096												
Error limits for the digital absolute value														
via RS 485		± 180 angular seconds												
Error limits for evaluating the "512" signals,														
integral non-linearity		± 40 angular seconds												
Non-linearity within a sine/cosine period														
differential non-linearity		± 18 angular seconds												
Output frequency for sine/cosine signals		0 ... 100 kHz												
Working speed up to which the absolute position can be reliably produced		6,000 min ⁻¹												
Max. operating speed		12,000 min ⁻¹												
Max. angular acceleration		5 x 10 ⁵ rad/s ²												
Operating torque		0.2 Ncm												
Starting torque		0.4 Ncm												
Permissible shaft movement														
statisch	radial/axial	± 0.5 mm/± 0.75 mm												
dynamisch	radial/axial	± 0.1 mm/± 0.25 mm												
Angular motion, perpendicular to the rotational axis														
static		± 0.005 mm/mm												
dynamic		± 0.0025 mm/mm												
Life of ball bearings		3.6 x 10 ⁹ revolutions												
Working temperature range		- 20 ... + 115 °C												
Storage temperature range		- 40 ... + 125 °C												
Permissible relative humidity ⁴⁾		90 %												
Resistance														
to shocks ²⁾		85/6 g/ms												
to vibration ³⁾		20/10 ... 2000 g/Hz												
Protection to IEC 60529 ⁴⁾		IP 40												
EMC ⁵⁾														
Operating voltage range		7 ... 12 V												
Recommended supply voltage		8 V												
Max. operating current, no load		100 ... 130 mA												
Available memory area within EEPROM		128 bytes												
Interface signals														
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential												
Parameter channel = RS 485		Digital												

⁴⁾ Condensation not permissible

²⁾ To DIN EN 60068-2-27

³⁾ To DIN EN 60068-2-6

⁴⁾ In assembled state

⁵⁾ 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

SCS/SCM 70 tapered shaft; version for integration

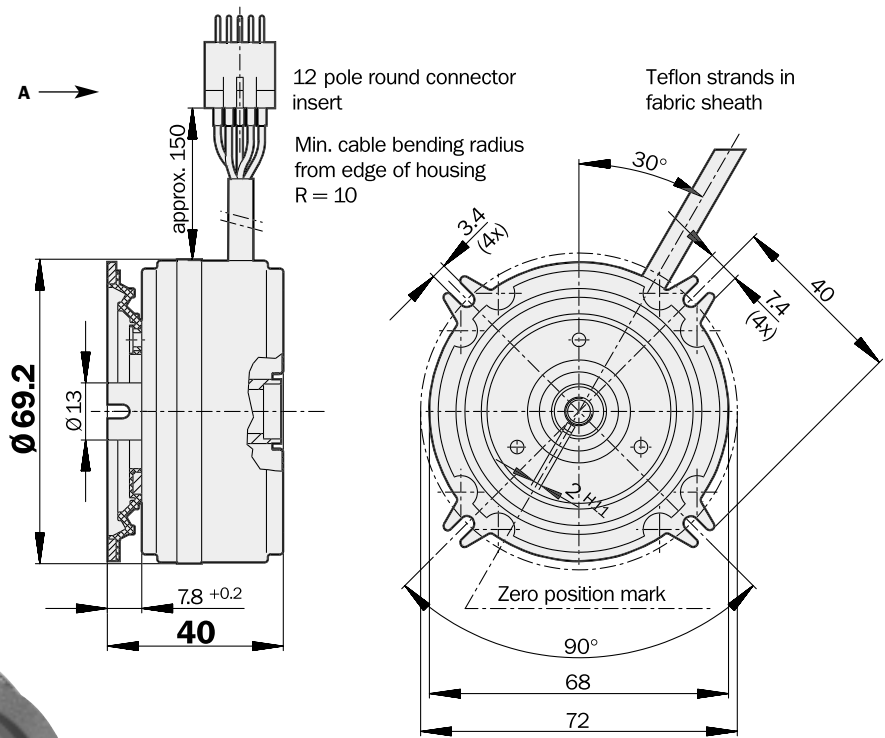
Type	Part no.	Description
SCS70-HSV0-K01	1 034 085	Single, strand 150 mm with connector
SCM70-HSV0-K01	1 034 059	Multi, strand 150 mm with connector

512 sine/cosine periods

Motor Feedback Systems

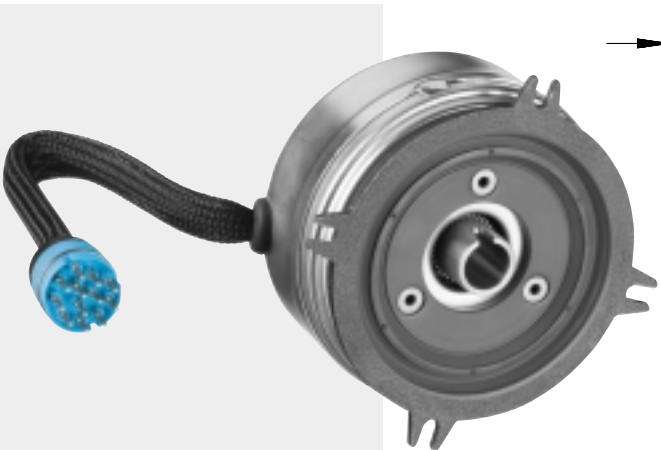
- 512 sine/cosine periods per revolution
- Absolute position with a resolution of 16,384 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SCS/SCM 70, hollow shaft, version for integration



Preset (default) zero position is 180° opposite the cable exit

General tolerances to DIN ISO 2768-mk

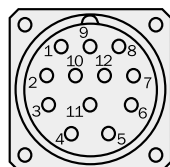


PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	REFCOS	black	Process data channel
2	Data +	grey	RS-485-parameter channel
3	N. C.	–	N. C.
4	N. C.	–	N. C.
5	SIN	white	Process data channel
6	REFSIN	brown	Process data channel
7	Data –	green	RS-485-parameter channel
8	COS	pink	Process data channel
9	Screen	–	Screen connection
10	GND	blue	Ground connection
11	N. C.	–	N. C.
12	U _s	red	Supply voltage 7 ... 12 V

Accessories

Connection technology
Fixing technology
Programming tool



View of the plug-in face

N. C. = Not Connected

Technical Data			Hollow Shaft, Version for Integration SCS/SCM 70											
			SCS	SCM										
Number of sine/cosine periods per revolution		512												
Dimensions		mm (see dimensional drawing)												
Mass		0.25 kg												
Inertial rotor moment		30 gcm ²												
Type of code 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		0.6 angular seconds												
Total number of steps	Single SCS	16,384												
	Multi SCM	67,108,864 = 16,384 x 4,096												
Error limits for the digital absolute value														
via RS 485		± 180 angular seconds												
Error limits for evaluating the "512" signals,														
integral non-linearity		± 40 angular seconds												
Non-linearity within a sine/cosine period														
differential non-linearity		± 18 angular seconds												
Output frequency for sine/cosine signals		0 ... 100 kHz												
Working speed up to which the absolute position can be reliably produced		6,000 min ⁻¹												
Max. operating speed		12,000 min ⁻¹												
Max. angular acceleration		5 x 10 ⁵ rad/s ²												
Operating torque		0.1 Ncm												
Starting torque		0.2 Ncm												
Permissible shaft movement														
statisch	radial/axial	± 0.5 mm/± 0.75 mm												
dynamisch	radial/axial	± 0.1 mm/± 0.25 mm												
Angular motion, perpendicular to the rotational axis														
static		± 0.005 mm/mm												
dynamic		± 0.0025 mm/mm												
Life of ball bearings		3.6 x 10 ⁹ revolutions												
Working temperature range		- 20 ... + 115 °C												
Storage temperature range		- 40 ... + 125 °C												
Permissible relative humidity ⁴⁾		90 %												
Resistance														
to shocks ²⁾		85/6 g/ms												
to vibration ³⁾		20/10 ... 2000 g/Hz												
Protection to IEC 60529 ⁴⁾		IP 40												
EMC ⁵⁾														
Operating voltage range		7 ... 12 V												
Recommended supply voltage		8 V												
Max. operating current, no load		100 ... 130 mA												
Available memory area within EEPROM		128 bytes												
Interface signals														
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential												
Parameter channel = RS 485		Digital												

⁴⁾ Condensation not permissible

²⁾ To DIN EN 60068-2-27

³⁾ To DIN EN 60068-2-6

⁴⁾ In assembled state

⁵⁾ 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

SCS/SCM 70 hollow shaft 10 mm; version for integration

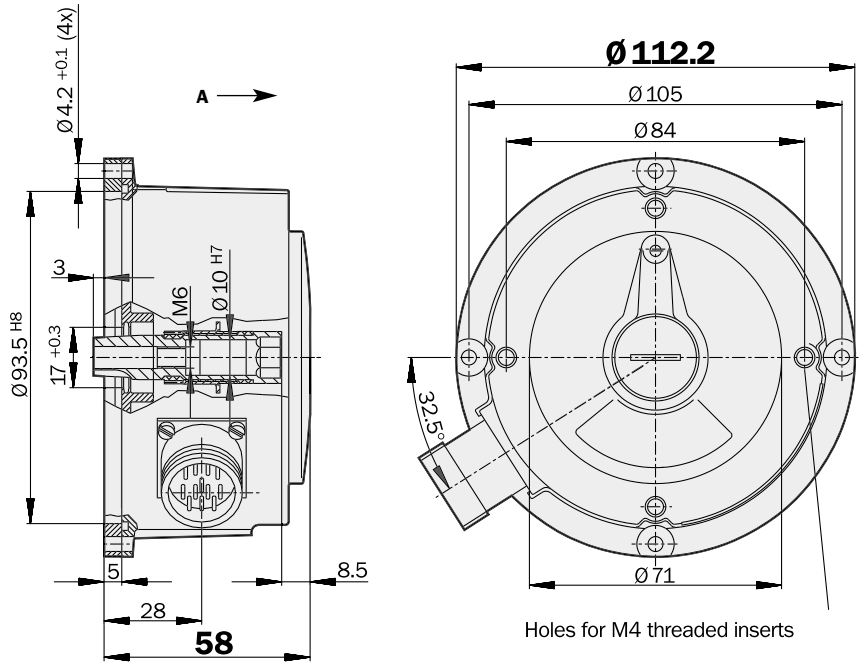
Type	Part no.	Description
SCS70-HLV0-K01	1 034 071	Single, strand 150 mm with connector
SCM70-HLV0-K01	1 034 048	Multi, strand 150 mm with connector

 **512 sine/cosine periods**

Motor Feedback Systems

- 512 sine/cosine periods per revolution
- Absolute position with a resolution of 16,384 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SCS/SCM 70, tapered shaft, version for attachment



Holes for M4 threaded inserts

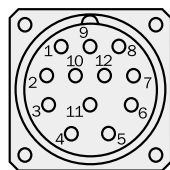
General tolerances to DIN ISO 2768-mk



PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	REFCOS	black	Process data channel
2	Data +	grey	RS-485-parameter channel
3	N. C.	–	N. C.
4	N. C.	–	N. C.
5	SIN	white	Process data channel
6	REFSIN	brown	Process data channel
7	Data –	green	RS-485-parameter channel
8	COS	pink	Process data channel
9	Screen	–	Screen connection
10	GND	blue	Ground connection
11	N. C.	–	N. C.
12	U _s	red	Supply voltage 7 ... 12 V

Accessories
Connection technology
Fixing technology
Programming tool



View of the plug-in face

Screen connection on connector housing

N. C. = Not Connected

Technical Data			Tapered Shaft, Version for Attachment SCS/SCM 70											
			SCS	SCM										
Number of sine/cosine periods per revolution	512													
Dimensions	mm (see dimensional drawing)													
Mass	0.50 kg													
Inertial rotor moment	30 gcm ²													
Type of code 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	0.6 angular seconds													
Total number of steps	Single SCS	16,384												
	Multi SCM	67,108,864 = 16,384 x 4,096												
Error limits for the digital absolute value														
via RS 485		± 180 angular seconds												
Error limits for evaluating the "512" signals,														
integral non-linearity		± 40 angular seconds												
Non-linearity within a sine/cosine period														
differential non-linearity		± 18 angular seconds												
Output frequency for sine/cosine signals		0 ... 100 kHz												
Working speed up to which the absolute position can be reliably produced		6,000 min ⁻¹												
Max. operating speed		12,000 min ⁻¹												
Max. angular acceleration		5 x 10 ⁵ rad/s ²												
Operating torque		0.2 Ncm												
Starting torque		0.4 Ncm												
Permissible shaft movement														
statisch	radial/axial	± 0.5 mm/± 0.75 mm												
dynamisch	radial/axial	± 0.1 mm/± 0.25 mm												
Angular motion, perpendicular to the rotational axis														
static		± 0.005 mm/mm												
dynamic		± 0.0025 mm/mm												
Life of ball bearings		3.6 x 10 ⁹ revolutions												
Working temperature range		- 20 ... + 115 °C												
Storage temperature range		- 40 ... + 125 °C												
Permissible relative humidity ⁴⁾		90 %												
Resistance														
to shocks ²⁾		85/6 g/ms												
to vibration ³⁾		20/10 ... 2000 g/Hz												
Protection to IEC 60529 ⁴⁾		IP 66												
EMC ⁵⁾														
Operating voltage range		7 ... 12 V												
Recommended supply voltage		8 V												
Max. operating current, no load		100 ... 130 mA												
Available memory area within EEPROM		128 bytes												
Interface signals														
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential													
Parameter channel = RS 485	Digital													

⁴⁾ Condensation not permissible

²⁾ To DIN EN 60068-2-27

³⁾ To DIN EN 60068-2-6

⁴⁾ In assembled state

⁵⁾ 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

SCS/SCM 70 tapered shaft, version for attachment

Type	Part no.	Description
SCS70-HSA0-K01	1 034 084	Single, connector
SCM70-HSA0-K01	1 034 058	Multi, connector

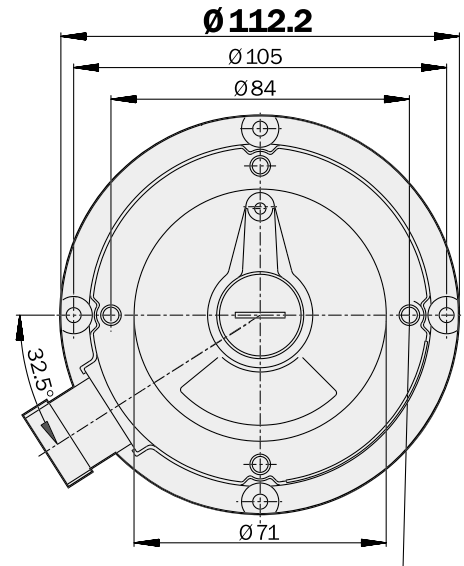
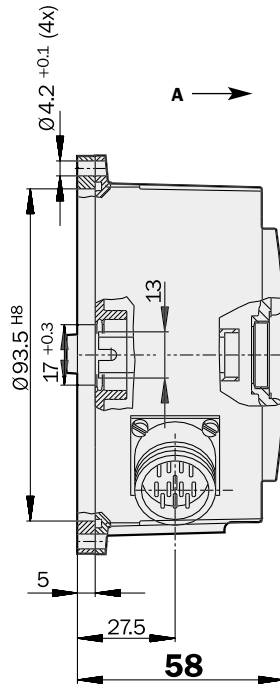
512 sine/cosine periods

Motor Feedback Systems

- 512 sine/cosine periods per revolution
- Absolute position with a resolution of 16,384 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label



Dimensional drawing SCS/SCM 70, hollow shaft, version for attachment



Holes for M4 threaded inserts

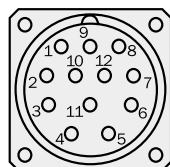
General tolerances to DIN ISO 2768-mk

PIN and wire allocation

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

Accessories

Connection technology
Fixing technology
Programming tool



View of the plug-in face

Screen connection on connector housing

N. C. = Not Connected

Technical Data		Hollow Shaft, Version for Attachment SCS/SCM 70		SCS	SCM								
Number of sine/cosine periods per revolution	512												
Dimensions	mm (see dimensional drawing)												
Mass	0.50 kg												
Inertial rotor moment	30 gcm ²												
Type of code 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	0.6 angular seconds												
Total number of steps	Single SCS	16,384											
	Multi SCM	67,108,864 = 16,384 x 4,096											
Error limits for the digital absolute value	via RS 485	± 180 angular seconds											
Error limits for evaluating the "512" signals,	integral non-linearity	± 40 angular seconds											
Non-linearity within a sine/cosine period	differential non-linearity	± 18 angular seconds											
Output frequency for sine/cosine signals		0 ... 100 kHz											
Working speed up to which the absolute position can be reliably produced		6,000 min ⁻¹											
Max. operating speed		12,000 min ⁻¹											
Max. angular acceleration		5 x 10 ⁵ rad/s ²											
Operating torque		0.2 Ncm											
Starting torque		0.4 Ncm											
Permissible shaft movement	statisch	radial/axial	± 0.5 mm/± 0.75 mm										
	dynamisch	radial/axial	± 0.1 mm/± 0.25 mm										
Angular motion, perpendicular to the rotational axis	static		± 0.005 mm/mm										
	dynamic		± 0.0025 mm/mm										
Life of ball bearings			3.6 x 10 ⁹ revolutions										
Working temperature range			- 20 ... + 115 °C										
Storage temperature range			- 40 ... + 125 °C										
Permissible relative humidity ⁴⁾			90 %										
Resistance	to shocks ²⁾		85/6 g/ms										
	to vibration ³⁾		20/10 ... 2000 g/Hz										
Protection to IEC 60529 ⁴⁾			IP 66										
EMC ⁵⁾													
Operating voltage range			7 ... 12 V										
Recommended supply voltage			8 V										
Max. operating current, no load			100 ... 130 mA										
Available memory area within EEPROM			128 bytes										
Interface signals	Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential											
	Parameter channel = RS 485	Digital											

⁴⁾ Condensation not permissible

²⁾ To DIN EN 60068-2-27

³⁾ To DIN EN 60068-2-6

⁴⁾ In assembled state

⁵⁾ 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

SCS/SCM 70 hollow shaft 10 mm; version for attachment

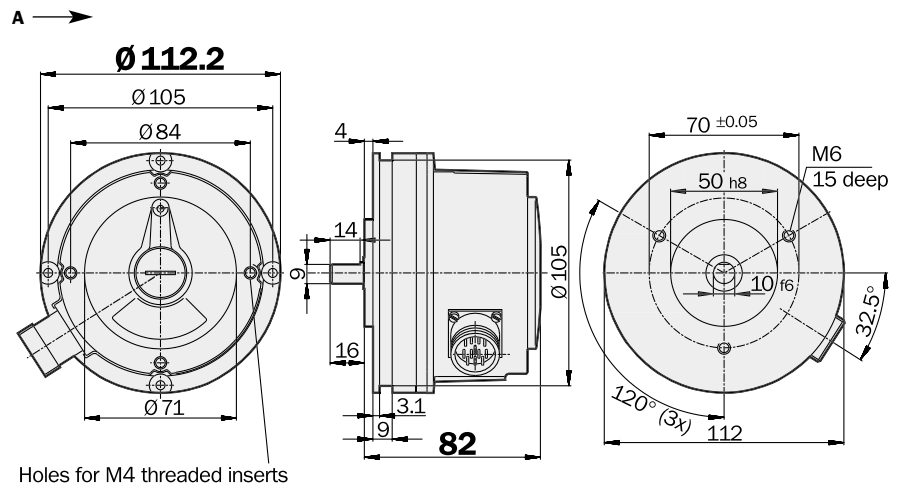
Type	Part no.	Description
SCS70-HLA0-K01	1 034 069	Single, connector
SCM70-HLA0-K01	1 034 047	Multi, connector

512 sine/cosine periods

Motor Feedback Systems

- 512 sine/cosine periods per revolution
- Absolute position with a resolution of 16,384 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SCS/SCM 70 standalone with flange adaptor

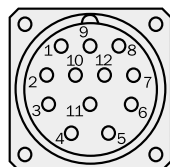


General tolerances to DIN ISO 2768-mk



PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	REFCOS	black	Process data channel
2	Data +	grey	RS-485-parameter channel
3	N. C.	–	N. C.
4	N. C.	–	N. C.
5	SIN	white	Process data channel
6	REFSIN	brown	Process data channel
7	Data –	green	RS-485-parameter channel
8	COS	pink	Process data channel
9	Screen	–	Screen connection
10	GND	blue	Ground connection
11	N. C.	–	N. C.
12	U _s	red	Supply voltage 7 ... 12 V



View of the plug-in face

Screen connection on connector housing

N. C. = Not Connected

Accessories

Connection technology
Fixing technology
Programming tool



Technical Data		Standalone with Flange Adaptor SCS/SCM 70	SCS	SCM								
Number of sine/cosine periods per revolution	512											
Dimensions	mm (see dimensional drawing)											
Mass	1.0 kg											
Inertial rotor moment	30 gcm ²											
Type of code 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	0.6 angular seconds											
Total number of steps	Single SCS	16,384										
	Multi SCM	67,108,864 = 16,384 x 4,096										
Error limits for the digital absolute value												
via RS 485	± 180 angular seconds											
Error limits for evaluating the "512" signals,												
integral non-linearity	± 40 angular seconds											
Non-linearity within a sine/cosine period												
differential non-linearity	± 18 angular seconds											
Output frequency for sine/cosine signals	0 ... 100 kHz											
Working speed up to which the absolute position can be reliably produced	6,000 min ⁻¹											
Max. operating speed	12,000 min ⁻¹											
Max. angular acceleration	5 x 10 ⁵ rad/s ²											
Operating torque with shaft sealing ring	1 Ncm											
Starting torque with shaft sealing ring	2 Ncm											
Load capacity of shaft	radial/axial	400 N/200 N										
Life of ball bearings		3,6 x 10 ⁹ revolutions										
Working temperature range		- 20 ... + 115 °C										
Storage temperature range		- 30 ... + 125 °C										
Permissible relative humidity ⁴⁾		90 %										
Resistance												
to shocks ²⁾		85/6 g/ms										
to vibration ³⁾		20/10 ... 2000 g/Hz										
Protection to IEC 60529 ⁴⁾		IP 65										
EMC ⁵⁾												
Operating voltage range		7 ... 12 V										
Recommended supply voltage		8 V										
Max. operating current, no load		100 ... 130 mA										
Available memory area within EEPROM		128 bytes										
Interface signals												
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential											
Parameter channel = RS 485	Digital											

¹⁾ Condensation not permissible

²⁾ To DIN EN 60068-2-27

³⁾ To DIN EN 60068-2-6

⁴⁾ With mating connector inserted

⁵⁾ To DIN EN 61000-3 and DIN EN 61000-2

Ordering information

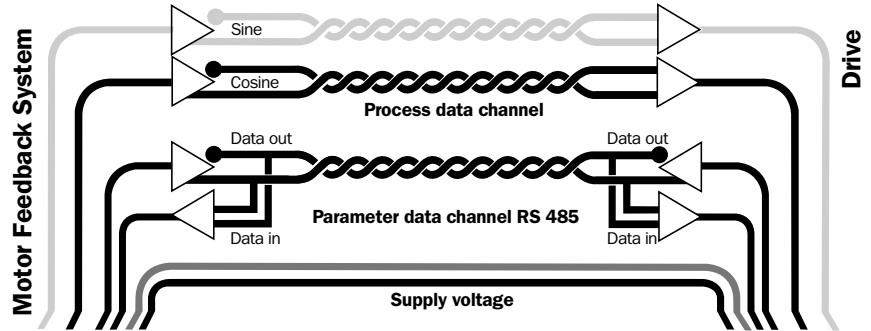
SCS/SCM 70 standalone with flange adaptor

Type	Part no.	Description
SCS70-HYA0-K01	1 034 087	Single
SCM70-HYA0-K01	1 034 060	Multi



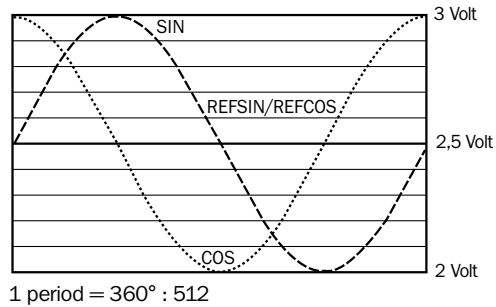
Electrical interface

- 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"



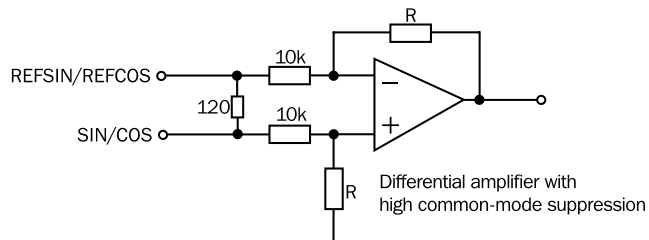
Access to the process data used for speed control, i.e. to the sine and cosine signals, is practically always "online". When the supply voltage is applied, the speed controller has access to this information at any time.

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

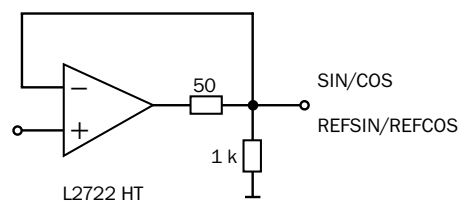
Characteristics applicable to all environmental conditions stated

Signal	Values/Units
Signal peak, peak V_{SS} 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





Type-specific settings	SCS	SCM
Type ID (command 52h)	02h	07h
Free EEPROM [bytes]	128	128
Address	40h	40h
Mode_485	E4h	E4h
Codes 0 ... 3	55h	55h
Counter	0	0

Overview of commands supported			SCS	SCM
Command byte	Function	Code 0 ¹⁾	Comments	Comments
42h	Read Position			
43h	Set Position	•		
44h	Read analogue value		Channel number F0 h Temperature [°C] ²⁾	Channel number F0 h 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 = 02h	Encoder type = 07h
53h	Encoder reset			
55h	Allocate encoder address	•		
56h	Read serial number and program version			
57h	Configure serial interface	•		

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.

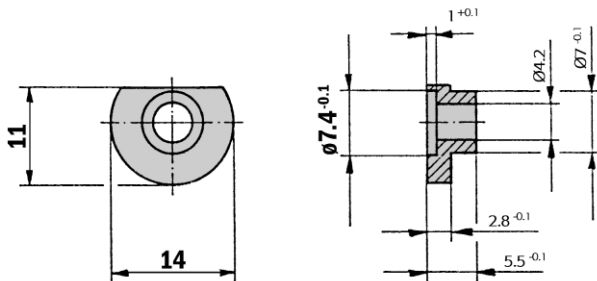
²⁾) Encoder temperature = $\frac{\text{Digital value} + 40}{2,048}$

Overview of status messages				
Error type	Status code	Description	SCS	SCM
	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 ² C-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 drawings and ordering information

Servo clamp small, set (contents 3 off) for servo flanges

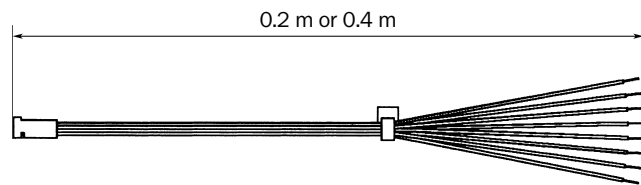
Type	Part no.
BEF-WK-SF	2 029 166



General tolerances to DIN ISO 2768-mk

Stranded cable, straight, 8 wires, 8 x 0,24 mm²

Type	Part no.	Contacts	Wire length
DOL-OB08-GOM2XB1	2 031 081	8	0.2 m
DOL-OB08-GOM4XB1	2 031 083	8	0.4 m

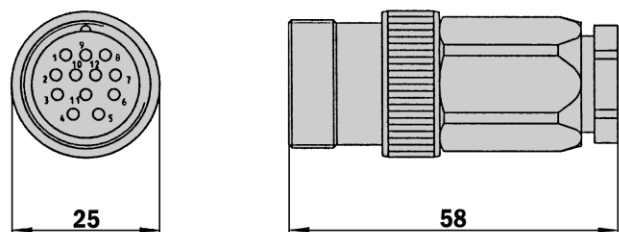
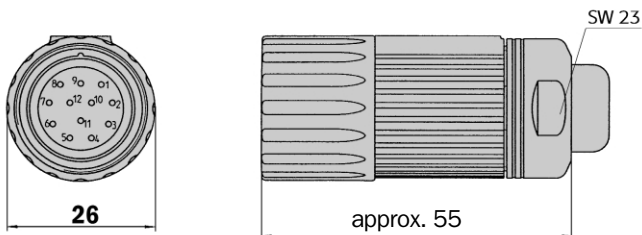


Connector M23 female, 12 pin, straight

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

Connector M23 male, 12 pin, straight, screened

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



Dimensional drawings and ordering information
Connector M23 female, 12 pin, straight, cable 8 wires, HIPERFACE®; screened

Type	Part no.	Contacts	Cable length
DOL-2308-G1M5JB2	2 031 069	12	1.5 m
DOL-2308-G03MJB2	2 031 070	12	3.0 m
DOL-2308-G05MJB2	2 031 071	12	5.0 m
DOL-2308-G10MJB2	2 031 072	12	10.0 m
DOL-2308-G15MJB2	2 031 073	12	15.0 m

HIPERFACE® cable, 8 wires, supplied by the metre 4 x 2 x 0,15 mm²

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

Programming tool for HIPERFACE®-devices

Type	Part no.	Motor Feedback System
PGT-03-S	1 034 252	SCS/SCM 60; SCS/SCM 70

Contact:

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 5091-4900
E-Mail sac@sick.com.br

Česká 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

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

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
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