

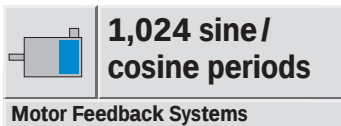
SinCos® SRS64, SRM64: Motor Feedback Systems with HIPERFACE®- Interface for Self-Ventilated and Force- Ventilated Drives



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

Possible product variations:

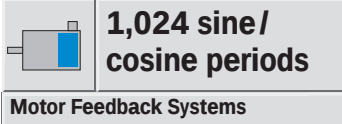
Hollow shafts up to 14 mm in diameter



The SRS/SRM series of motor feedback systems are used worldwide in many different applications and environments.

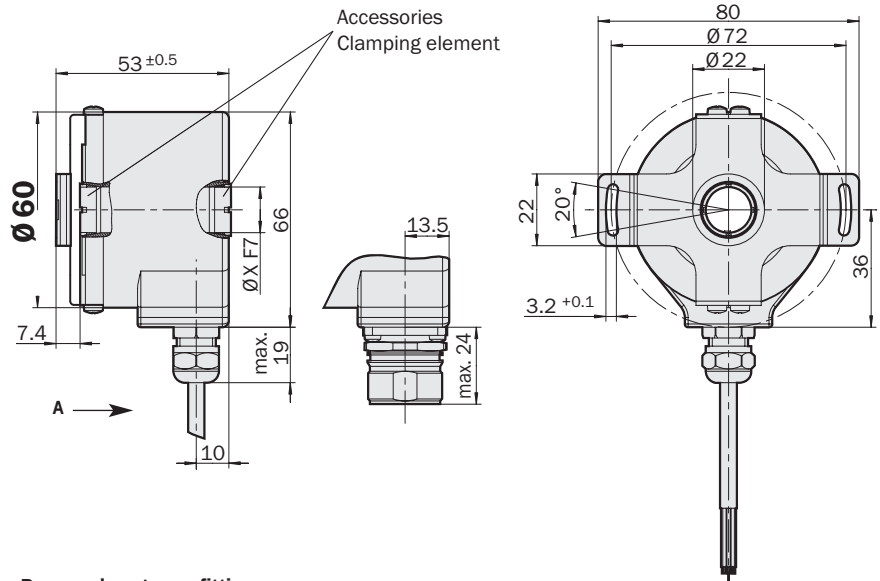
Absolute positioning with 32,768 steps per revolution and a maximum of 4,096 revolutions give a total resolution of 134,217,728 steps.

SICK | STEGMANN

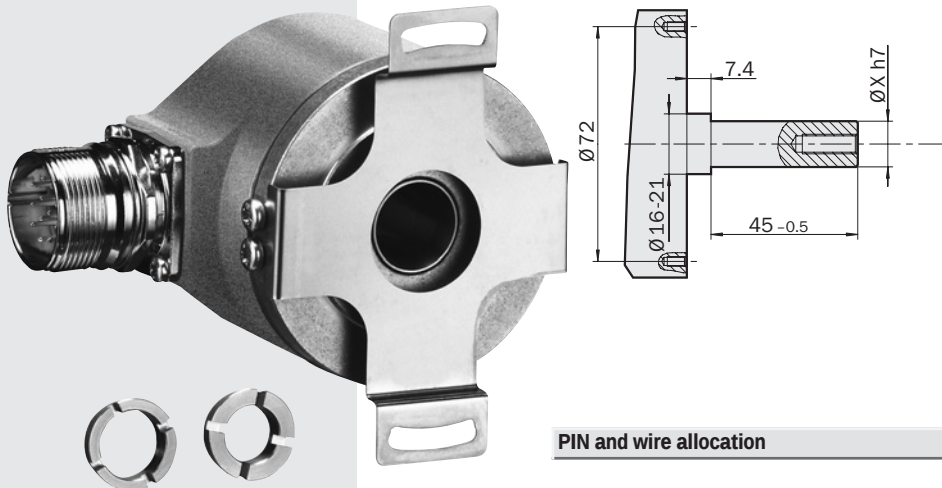


- 1,024 sine/cosine periods per revolution
- Absolute position with a resolution of 32,768 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SRS/SRM64



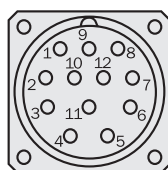
Proposed customer fitting



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 or yellow	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 or purple	RS 485 parameter channel
8	COS	pink	Process data channel
9	N. C.	-	N. C.
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
Programming tool
Clamping elements

Technical Data according to DIN 32878		Hollow Shaft SRS/SRM64	SRS	SRM									
Number of sine/cosine periods per revolution	1,024												
Dimensions	mm (see dimensional drawing)												
Weight	0.3 kg												
Inertial rotor moment	45 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	0.3 angular seconds												
Total number of steps	Single SRS 32,768												
	Multi SRM 134,21,728 = 4,096 x 32,768												
Error limits for the digital absolute value													
via RS 485	± 90 angular seconds												
Error limits for evaluating the "1,024" signals,													
integral non-linearity	± 45 angular seconds												
Non-linearity within a sine/cosine period													
differential non-linearity	± 7 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	5 x 10 ⁵ rad/s ²												
Operating torque	0.2 Ncm												
Starting torque	0.4 Ncm												
Permissible shaft movement													
static	radial/axial ± 0.1 mm/± 2 mm												
dynamic	radial/axial ± 0.05 mm/± 0,2 mm												
Angular motion, perpendicular to the rotational axis													
static	34 x 10 ⁻³ mm/mm												
dynamic	17 x 10 ⁻³ mm/mm												
Life of ball bearings	3.6 x 10 ⁹ revolutions												
Working temperature range	- 20 ... + 110 °C												
Storage temperature range (without packaging)	- 20 ... + 115 °C												
Permissible relative humidity ¹⁾	90 %												
Shock resistance ²⁾	100/10 g/ms												
Oscillation resistance 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	< 80 mA												
Available memory area													
within EEPROM 512 ⁶⁾	128 bytes												
within EEPROM 2048 ⁶⁾	1,792 bytes												
Interface signals													
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential												
Parameter channel = RS 485	Digital												

¹⁾ Condensation not permissible

²⁾ To EN 60068-2-27

³⁾ To EN 60068-2-6

⁴⁾ In assembled state

⁵⁾ To EN 61000-6-2 and N 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. 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.

⁶⁾ 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

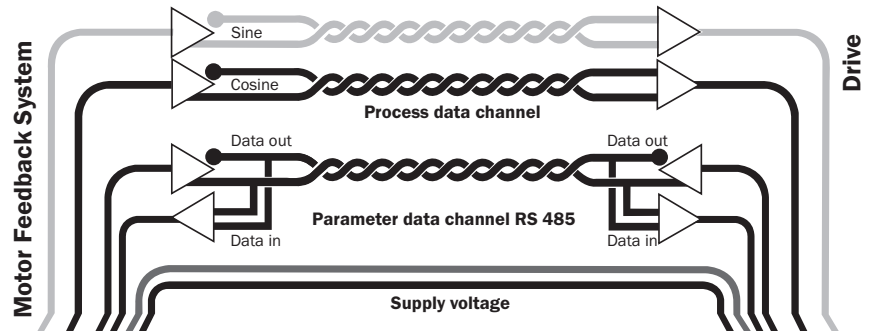
SRS/SRM64; hollow shaft *

Type	Part no.	Description
SRS64-HRK0-K01	1034225	Single, 512 EEPROM, cable 1.5 m
SRS64-HRA0-K01	1034223	Single, 512 EEPROM, connector
SRM64-HRK0-K01	1034164	Multi, 512 EEPROM, cable 1.5 m
SRM64-HRA0-K01	1034162	Multi, 512 EEPROM, connector
SRS64-HRK0-K02	1034226	Single, 2048 EEPROM, cable 1.5 m
SRS64-HRA0-K02	1034224	Single, 2048 EEPROM, connector
SRM64-HRK0-K02	1034165	Multi, 2048 EEPROM, cable 1.5 m
SRM64-HRA0-K02	1034163	Multi, 2048 EEPROM, connector

* Clamping elements for 10, 12, 14 mm and 3/8" and 1/2" as accessories separate order item (see page 6).

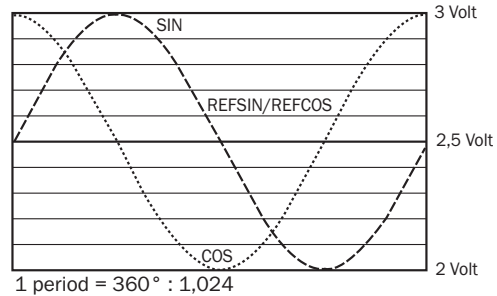
Electrical interface

- Safe data transmission
- High information content
- Electronic rating plate
- 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"



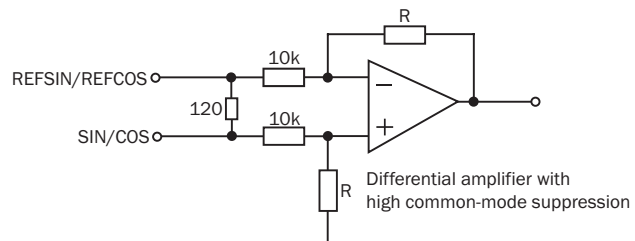
Access to the process data used for speed control, i.e. to the sine and cosine signals, is practically always "online". When the supply voltage is applied, the speed controller has access to this information at any time.

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

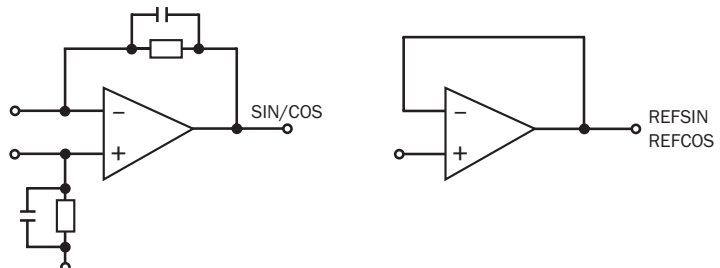
Characteristics applicable to all environmental conditions stated

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	SRS	SRM
Type ID (command 52h)	22h	27h
Free EEPROM [bytes]	128/1,792	128/1,792
Address	40h	40h
Mode_485	E4h	E4h
Codes 0 ... 3	55h	55h
Counter	0	0

Overview of commands supported			SRS	SRM
Command byte	Function	Code 0 ¹⁾	Comments	Comments
42h	Read position			
43h	Set position	•		
44h	Read analogue value		Channel number 48h	Channel number 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 = 22h	Encoder type = 27h
53h	Encoder reset			
55h	Allocate encoder address	•		
56h	Read serial number and program version			
57h	Configure serial interface	•		

¹⁾ Code 0 is a byte inserted into the protocol, for additional safeguarding of vital system parameters against accidental overwriting.
When shipped, "Code 0" = 55h.

Overview of status messages				
Error type	Status code	Description	SRS	SRM
	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

Clamping elements, set (contents 2 off)

Type	Part no.	Size
BEF-MW-SR64D14	2031074	14 mm
BEF-MW-SR64D12	2031075	12 mm
BEF-MW-SR64D10	2031076	10 mm
BEF-MW-SR64D1E2	2031077	1/2"
BEF-MW-SR64D3E8	2031078	3/8"

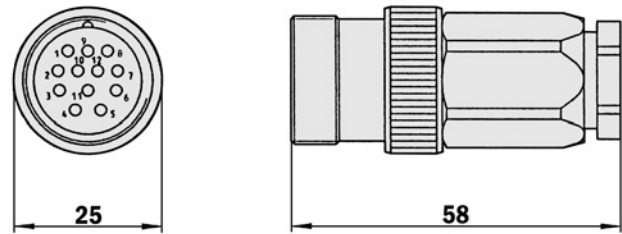
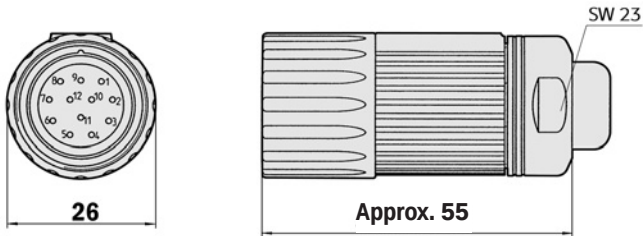


Connector M23 female, 12-pin, straight

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

Connector M23 male, 12-pin, straight, screened

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



General tolerances to DIN ISO 2768-mk

General tolerances to DIN ISO 2768-mk

Cable connector M23, 12-pin, straight, cable 8-core, HIPERFACE®, screened

Type	Part no.	Contacts	Wire length
DOL-2308-G1M5JB2	2031069	12	1.5 m
DOL-2308-G03MJB2	2031070	12	3.0 m
DOL-2308-G05MJB2	2031071	12	5.0 m
DOL-2308-G10MJB2	2031072	12	10 m
DOL-2308-G15MJB2	2031073	12	15 m

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

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

Dimensional drawings and ordering information**Programming tool for HIPERFACE®-devices**

Type	Part no.	Motor Feedback System
PGT-03-S	1034252	SRS/SRM64

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