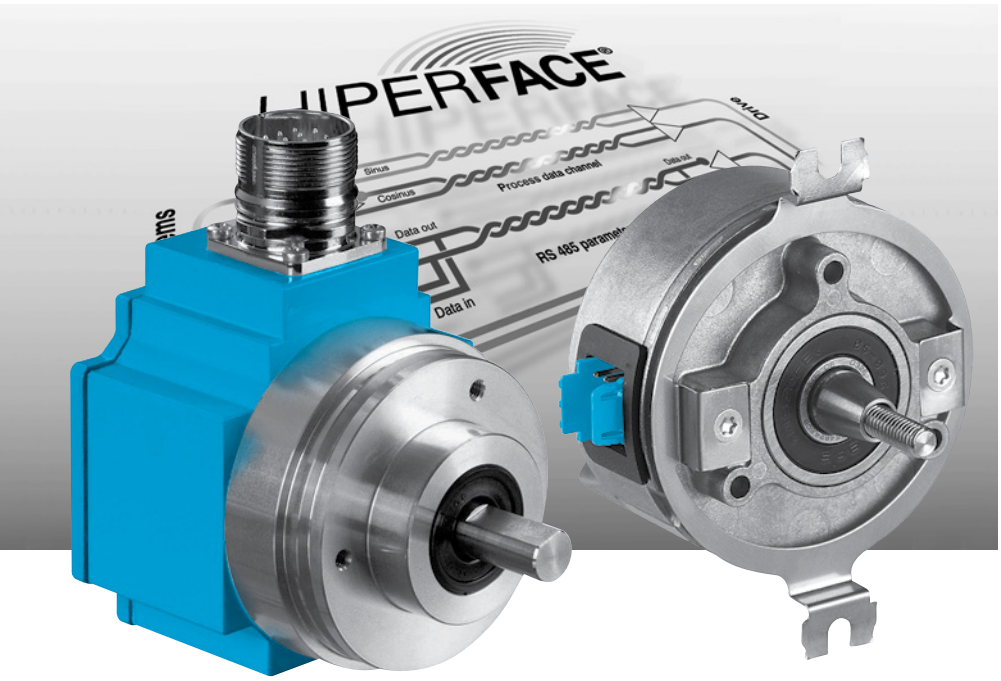
SinCos® SRS50, SRM50, SRS50 Standalone, SRM50 Standalone Generation 2: Motor Feedback Systems with HIPERFACE® interface for Servo Motors



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

Features of Generation 2:

- Shorter body reduces the encoder's installation depth
- Higher precision due to widely spaced bearings
- RoHS-compliant product range
- Reverse polarity protected

1,024 sine/ cosine periods

Motor Feedback Systems

HIPERFACE® by SICK

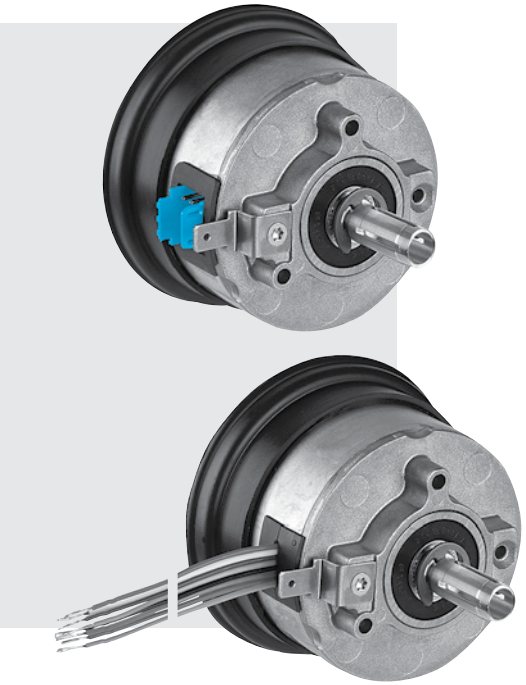
SRS/SRM series of Motor Feedback Systems are used worldwide in many different applications and environments.
Absolute positioning with 32,768 steps per revolution and a maximum of 4,096 revolutions give a total resolution of 134,217,728 steps.

SICK
Sensor Intelligence.

1,024 sine/ cosine periods

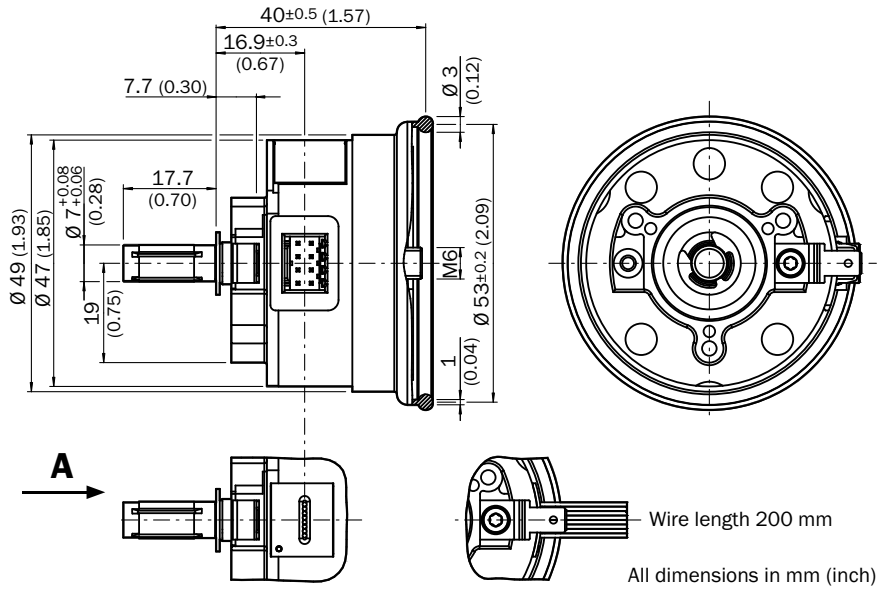
Motor Feedback Systems

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



Product may differ from illustration

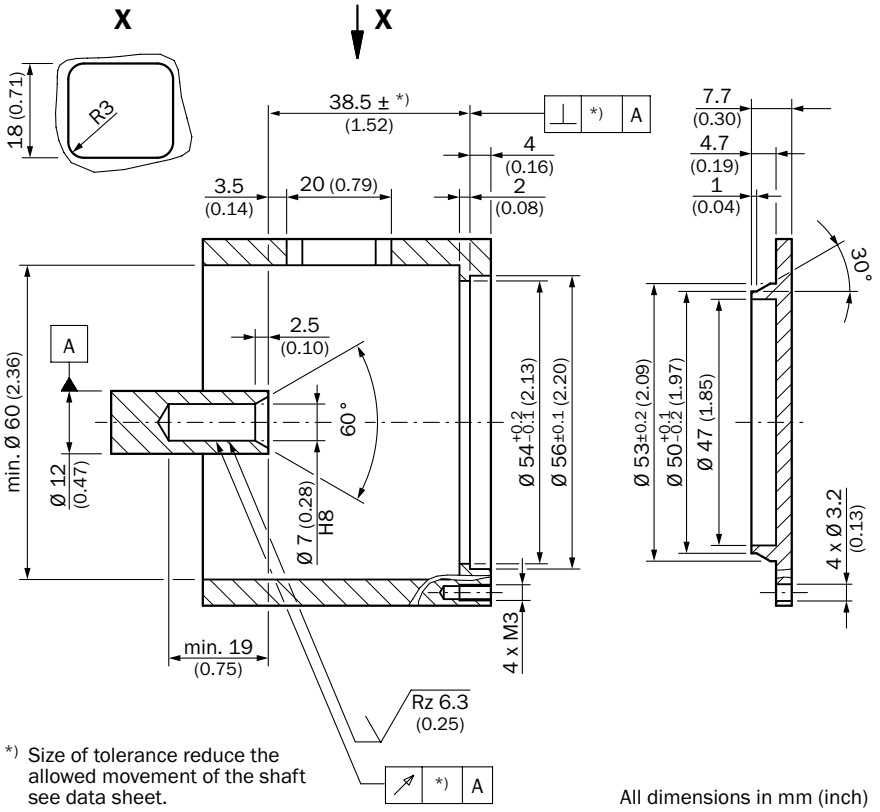
Dimensional drawing SRS/SRM50, rubber support Ø 50



All dimensions in mm (inch)

General tolerances according to DIN ISO 3302-1

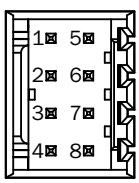
Proposed customer fitting SRS/SRM50, rubber support Ø 50



*) Size of tolerance reduce the allowed movement of the shaft see data sheet.

All dimensions in mm (inch)

PIN and wire allocation



PIN	Signal	Colour of Wires	Explanation
1	Us	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 or yellow	RS-485-parameter channel
6	Data –	green or purple	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 (page 20)
Mounting systems (page 20)
Programming tool (page 20)

Technical data to DIN 32878		Plug-in shaft SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution		1,024		
Number of the absolute ascertainable revolutions	Single SRS	1		
	Multi SRM	4,096		
Dimensions		mm (see dimensional drawing)		
Mass		0.20 kg		
Moment of inertia to the rotor		10 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		0.3 angular seconds		
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 45 angular seconds [1]		
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		12,000 min^{-1}		
Max. angular acceleration		0.2 x 10^6 rad/s^2		
Operating torque		0.2 Ncm		
Starting torque		0.4 Ncm		
Permissible shaft movement				
static	radial/axial	± 0.5 mm/± 0.75 mm		
dynamic	radial/axial	± 0.1 mm/± 0.2 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		–30 ... +115 °C		
Storage temperature range (without packaging)		–40 ... +125 °C		
Permissible relative humidity [2]		90 %		
Resistance				
To shocks [3]		100 g/10 ms		
To vibration [4]		20 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		80 mA		
Available memory area				
Within EEPROM 512 [7]		128 bytes		
Within EEPROM 2048 [7]		1,792 bytes		
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential		
Parameter channel = RS 485		Digital		

[1] Without mechanical tension of the stator coupling

[2] Condensation not permitted

[3] To EN 60068-2-27

[4] To EN 60068-2-6

[5] With mating connector inserted

[6] 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. 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.

[7] 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

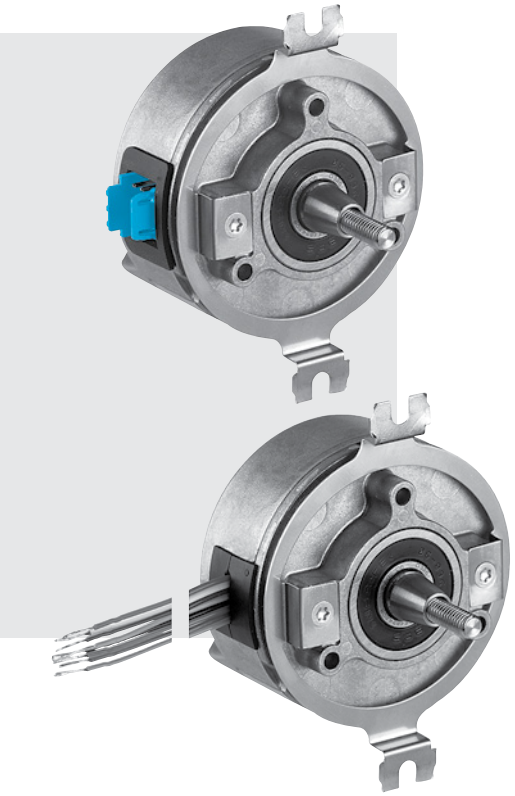
SRS/SRM50; plug-in shaft Ø 7mm; rubber support

Model name	Part no.	Description
SRS50-HAA0-K21	1037059	Single, 512 EEprom, connector
SRS50-HAV0-K21	1037061	Single, 512 EEprom, stranded cable
SRS50-HAA0-K22	1037060	Single, 2048 EEprom, connector
SRS50-HAV0-K22	1037062	Single, 2048 EEprom, stranded cable
SRM50-HAA0-K21	1037063	Multi, 512 EEprom, connector
SRM50-HAV0-K21	1037065	Multi, 512 EEprom, stranded cable
SRM50-HAA0-K22	1037064	Multi, 2048 EEprom, connector
SRM50-HAV0-K22	1037066	Multi, 2048 EEprom, stranded cable

1,024 sine/ cosine periods

Motor Feedback Systems

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

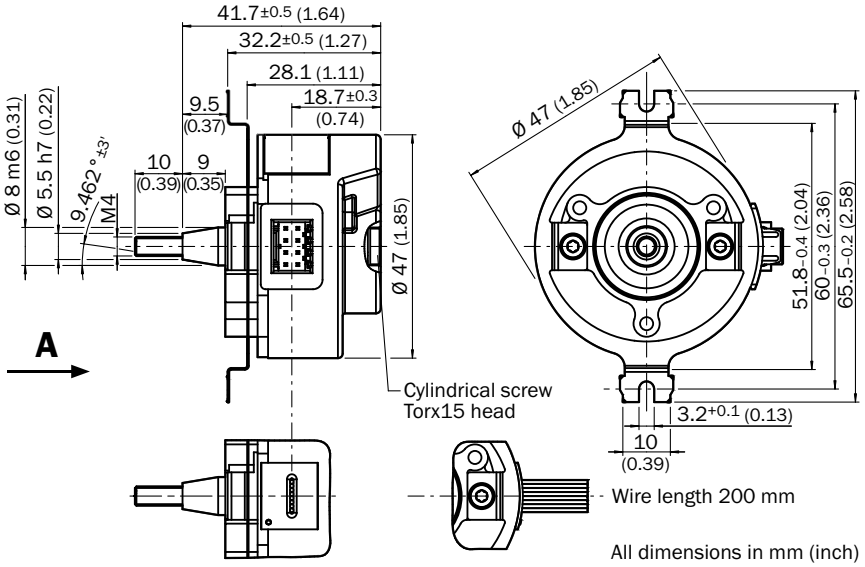


Product may differ from illustration

Accessories

Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

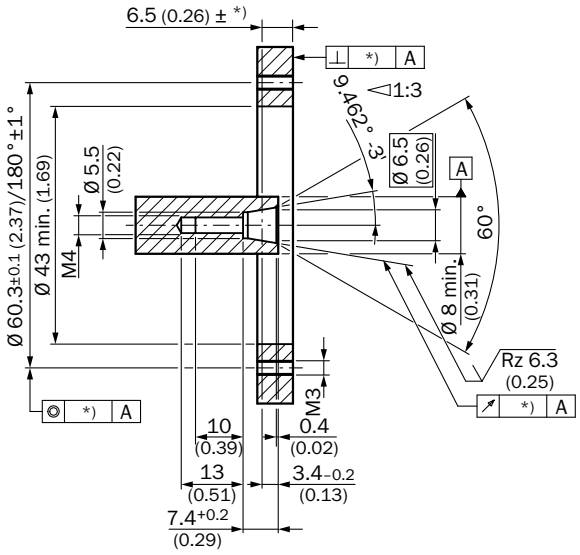
Dimensional drawing SRS/SRM50, spring mounting plate Ø 66



All dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

Proposed customer fitting SRS/SRM50, spring mounting plate Ø 66

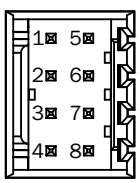


*) Size of tolerance reduce the allowed movement of the shaft see data sheet.

All dimensions in mm (inch)

PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	Us	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 or yellow	RS-485-parameter channel
6	Data –	green or purple	RS-485-parameter channel
7	+ SIN	white	Process data channel
8	+ COS	pink	Process data channel



Screening:
The encoder housing for the integrated encoder is connected to the motor, via the torque support. The connection space is thus screened via the motor housing such that, within the connection space, unscreened connection strands can be used.

Technical data to DIN 32878		Tapered shaft SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution		1,024		
Number of the absolute ascertainable revolutions	Single SRS	1		
	Multi SRM	4,096		
Dimensions		mm (see dimensional drawing)		
Mass		0.20 kg		
Moment of inertia to the rotor		10 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		0.3 angular seconds		
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 45 angular seconds [1]		
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		12,000 min^{-1}		
Max. angular acceleration		0.2 x 10^6 rad/s^2		
Operating torque		0.2 Ncm		
Starting torque		0.4 Ncm		
Permissible shaft movement				
static	radial/axial	± 0.5 mm/± 0.75 mm		
dynamic	radial/axial	± 0.1 mm/± 0.2 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		–30 ... +115 °C		
Storage temperature range (without packaging)		–40 ... +125 °C		
Permissible relative humidity [2]		90 %		
Resistance				
To shocks [3]		100 g/10 ms		
To vibration [4]		20 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		80 mA		
Available memory area				
Within EEPROM 512 [7]		128 bytes		
Within EEPROM 2048 [7]		1,792 bytes		
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential		
Parameter channel = RS 485		Digital		

[1] Without mechanical tension of the stator coupling

[2] Condensation not permitted

[3] To EN 60068-2-27

[4] To EN 60068-2-6

[5] With mating connector inserted

[6] 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. 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.

[7] 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

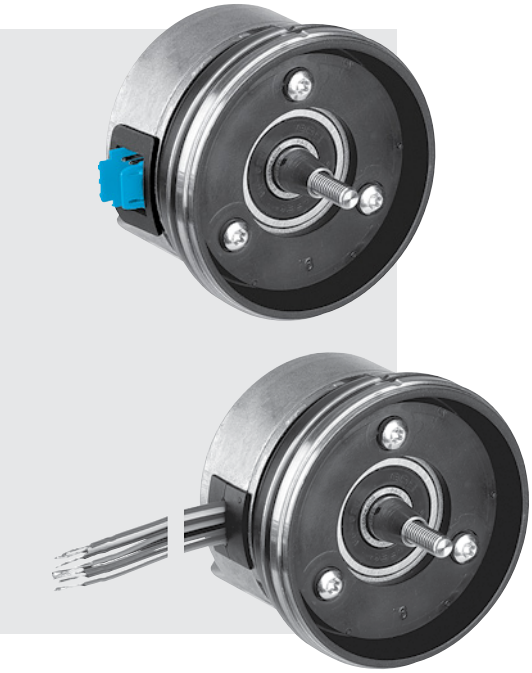
SRS/SRM50; tapered shaft; spring mounting plate

Model name	Part no.	Description
SRS50-HFA0-K21	1037067	Single, 512 EEprom, connector
SRS50-HFV0-K21	1037069	Single, 512 EEprom, stranded cable
SRS50-HFA0-K22	1037068	Single, 2048 EEprom, connector
SRS50-HFV0-K22	1037070	Single, 2048 EEprom, stranded cable
SRM50-HFA0-K21	1037071	Multi, 512 EEprom, connector
SRM50-HFV0-K21	1037073	Multi, 512 EEprom, stranded cable
SRM50-HFA0-K22	1037072	Multi, 2048 EEprom, connector
SRM50-HFV0-K22	1037074	Multi, 2048 EEprom, stranded cable

1,024 sine/ cosine periods

Motor Feedback Systems

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

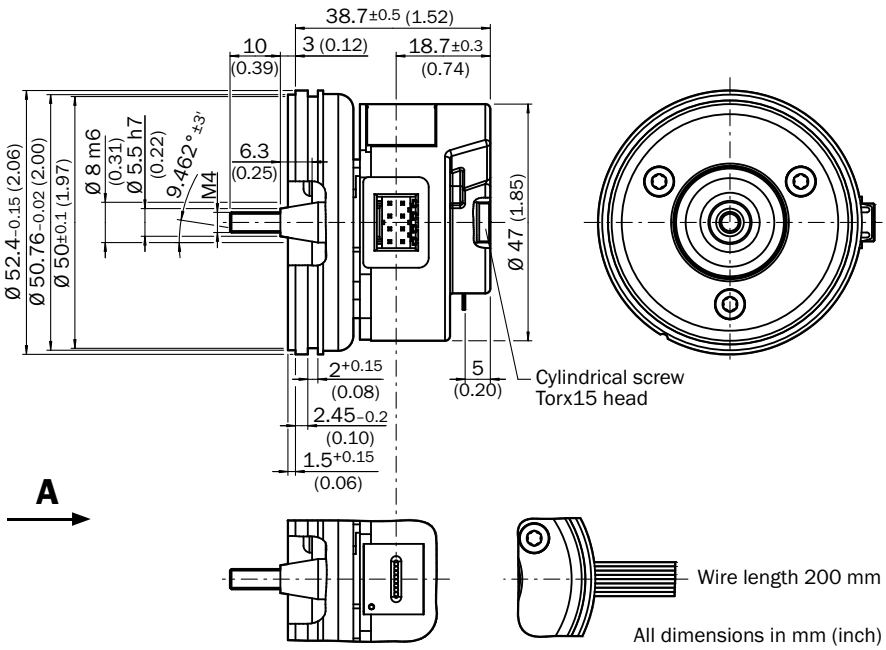


Product may differ from illustration

Accessories

Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

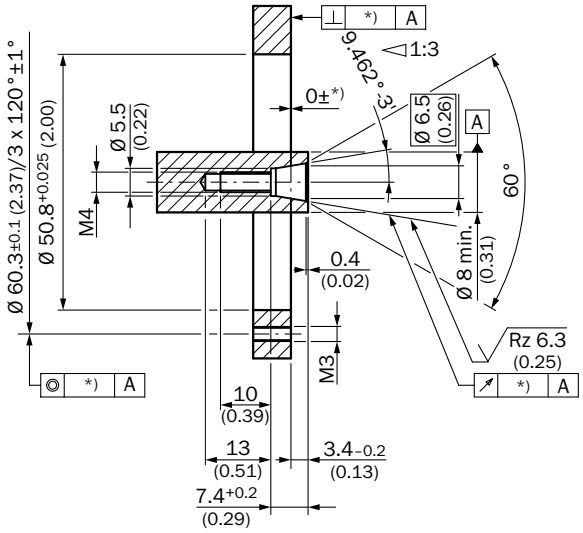
Dimensional drawing SRS/SRM50, resolver support Ø 52



All dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

Proposed customer fitting SRS/SRM50, resolver support Ø 52

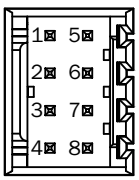


*) Size of tolerance reduce the allowed movement of the shaft see data sheet.

All dimensions in mm (inch)

PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	Us	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 or yellow	RS-485-parameter channel
6	Data –	green or purple	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 to DIN 32878		Tapered shaft SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution		1,024		
Number of the absolute ascertainable revolutions	Single SRS	1		
	Multi SRM	4,096		
Dimensions		mm (see dimensional drawing)		
Mass		0.20 kg		
Moment of inertia to the rotor		10 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		0.3 angular seconds		
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 45 angular seconds [1]		
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		12,000 min^{-1}		
Max. angular acceleration		0.2 x 10^6 rad/s^2		
Operating torque		0.2 Ncm		
Starting torque		0.4 Ncm		
Permissible shaft movement				
static	radial/axial	± 0.5 mm/± 0.75 mm		
dynamic	radial/axial	± 0.1 mm/± 0.2 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		–30 ... +115 °C		
Storage temperature range (without packaging)		–40 ... +125 °C		
Permissible relative humidity [2]		90 %		
Resistance				
To shocks [3]		100 g/10 ms		
To vibration [4]		20 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		80 mA		
Available memory area				
Within EEPROM 512 [7]		128 bytes		
Within EEPROM 2048 [7]		1,792 bytes		
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential		
Parameter channel = RS 485		Digital		

[1] Without mechanical tension of the stator coupling

[2] Condensation not permitted

[3] To EN 60068-2-27

[4] To EN 60068-2-6

[5] With mating connector inserted

[6] 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. 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.

[7] 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

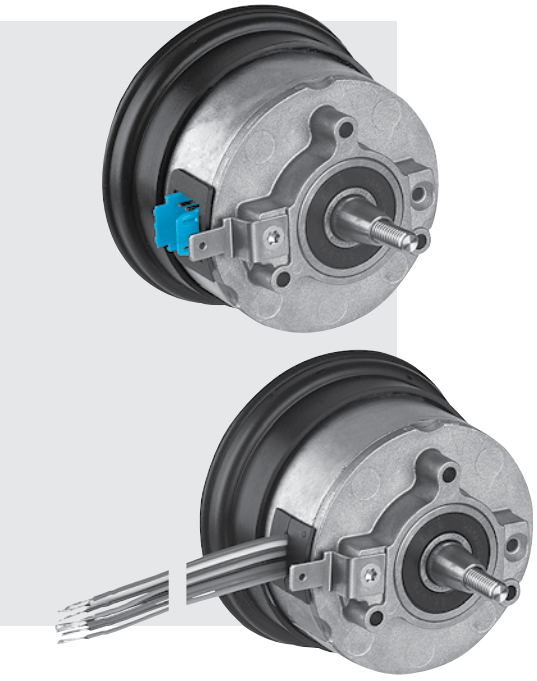
SRS/SRM50; tapered shaft; resolver support

Model name	Part no.	Description
SRS50-HGA0-K21	1037075	Single, 512 EEprom, connector
SRS50-HGV0-K21	1037077	Single, 512 EEprom, stranded cable
SRS50-HGA0-K22	1037076	Single, 2048 EEprom, connector
SRS50-HGV0-K22	1037078	Single, 2048 EEprom, stranded cable
SRM50-HGA0-K21	1037079	Multi, 512 EEprom, connector
SRM50-HGV0-K21	1037081	Multi, 512 EEprom, stranded cable
SRM50-HGA0-K22	1037080	Multi, 2048 EEprom, connector
SRM50-HGV0-K22	1037082	Multi, 2048 EEprom, stranded cable

1,024 sine/ cosine periods

Motor Feedback Systems

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

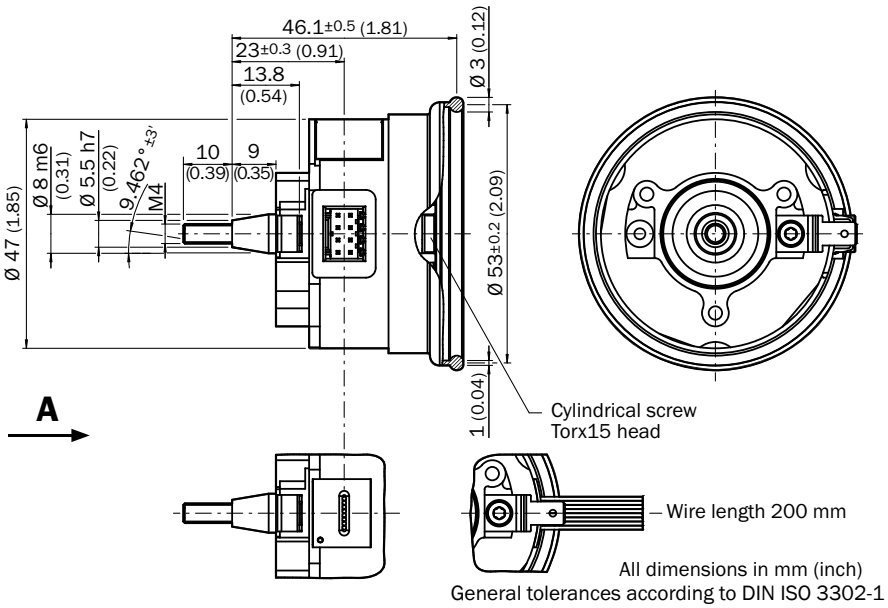


Product may differ from illustration

Accessories

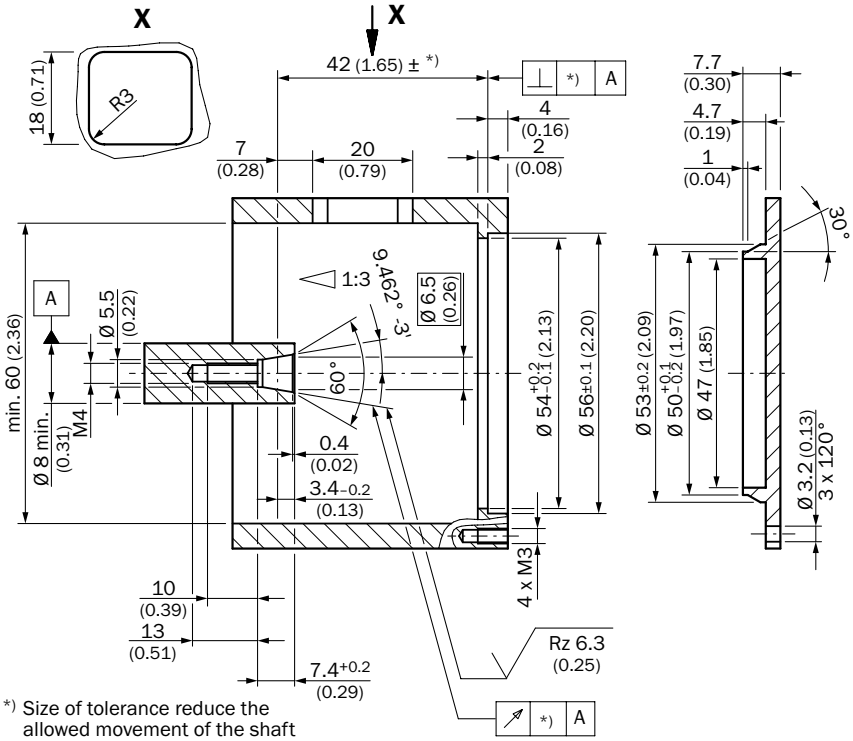
Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

Dimensional drawing SRS/SRM50, rubber support Ø 50



All dimensions in mm (inch)
General tolerances according to DIN ISO 3302-1

Proposed customer fitting SRS/SRM50, rubber support Ø 50



*) Size of tolerance reduce the allowed movement of the shaft see data sheet.

All dimensions in mm (inch)

PIN and wire allocation

PIN	Signal	Colour of Wires	Explanation
1	Us	red	Supply voltage 7 ... 12 V
2	GND	blue	Ground connection
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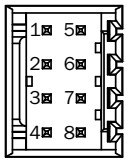
4	REFCOS	black	Process data channel
5	Data +	grey or yellow	RS-485-parameter channel
6	Data –	green or purple	RS-485-parameter channel
7	+ SIN	white	Process data channel
8	+ COS	pink	Process data channel



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

Technical data to DIN 32878		Tapered shaft SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution		1,024		
Number of the absolute ascertainable revolutions	Single SRS	1		
	Multi SRM	4,096		
Dimensions		mm (see dimensional drawing)		
Mass		0.20 kg		
Moment of inertia to the rotor		10 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		0.3 angular seconds		
Error limits for evaluating the sine/cosine signals				
integral non-linearity		± 45 angular seconds [1]		
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		12,000 min^{-1}		
Max. angular acceleration		0.2 x 10^6 rad/s^2		
Operating torque		0.2 Ncm		
Starting torque		0.4 Ncm		
Permissible shaft movement				
static	radial/axial	± 0.5 mm/± 0.75 mm		
dynamic	radial/axial	± 0.1 mm/± 0.2 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		–30 ... +115 °C		
Storage temperature range (without packaging)		–40 ... +125 °C		
Permissible relative humidity [2]		90 %		
Resistance				
To shocks [3]		100 g/10 ms		
To vibration [4]		20 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		80 mA		
Available memory area				
Within EEPROM 512 [7]		128 bytes		
Within EEPROM 2048 [7]		1,792 bytes		
Interface signals				
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential		
Parameter channel = RS 485		Digital		

[1] Without mechanical tension of the stator coupling

[2] Condensation not permitted

[3] To EN 60068-2-27

[4] To EN 60068-2-6

[5] With mating connector inserted

[6] To EN 61000-6-2 and EN 61000-6-3
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Users must perform their own tests when other screen designs are used.

[7] 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

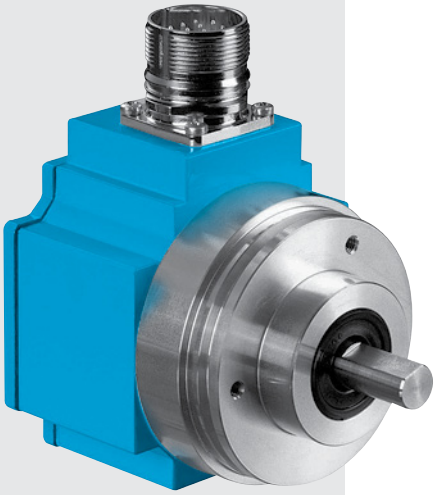
SRS/SRM50; tapered shaft; rubber support Ø 50 mm

Model name	Part no.	Description
SRS50-HEA0-K21	1037083	Single, 512 EEprom, connector
SRS50-HEV0-K21	1037085	Single, 512 EEprom, stranded cable
SRS50-HEA0-K22	1037084	Single, 2048 EEprom, connector
SRS50-HEV0-K22	1037086	Single, 2048 EEprom, stranded cable
SRM50-HEA0-K21	1037087	Multi, 512 EEprom, connector
SRM50-HEV0-K21	1037089	Multi, 512 EEprom, stranded cable
SRM50-HEA0-K22	1037088	Multi, 2048 EEprom, connector
SRM50-HEV0-K22	1037090	Multi, 2048 EEprom, stranded cable

1,024 sine/ cosine periods

Motor Feedback Systems

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



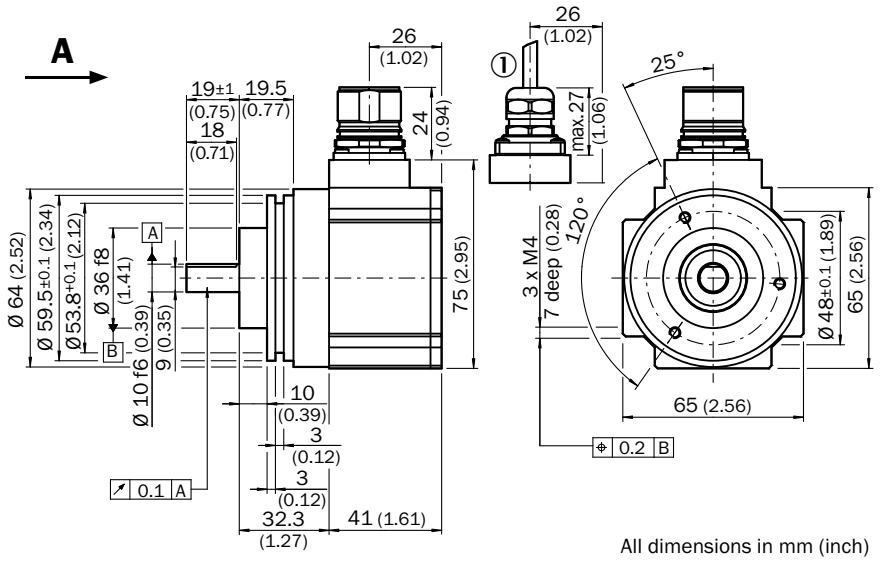
Product may differ from illustration

CE

Accessories

Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

Dimensional drawing SRS50/SRM50 Standalone, rectangular housing, face mount flange



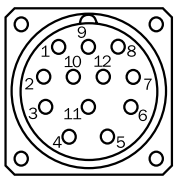
All dimensions in mm (inch)

① R = min. bending radius 40 mm

General tolerances according 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	Us	red	7 ... 12 V Supply voltage



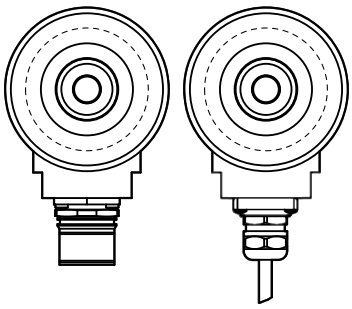
View of the plug-in face

Screen connection on connector housing

N. C. = Not connected

Type of connection

M23 Connector radial | Cable radial



2012-03
Subject to change without notice

Technical data to DIN 32878	Standalone, face mount flange SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution	1,024	■	■
Number of the absolute ascertainable revolutions	Single SRS: 1	■	
	Multi SRM: 4,096		■
Dimensions	mm (see dimensional drawing)	■	■
Mass	0.55 kg	■	■
Moment of inertia to the rotor	25 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	0.3 angular seconds	■	■
Error limits for evaluating the sine/cosine 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	6,000 min^{-1}	■	■
Max. angular acceleration	0.2 x 10^6 rad/s^2	■	■
Operating torque with shaft sealing ring	1 Ncm	■	■
Starting torque with shaft sealing ring	1.5 Ncm	■	■
Load capacity of shaft radial/axial	40 N/20 N	■	■
Life of ball bearings	3.6 x 10^9 revolutions	■	■
Working temperature range	–30 ... +85 °C	■	■
Storage temperature range	–30 ... +90 °C	■	■
Permissible relative humidity [1]	90 %	■	■
Resistance			
To shocks [2]	30 g/11 ms	■	■
To vibration [3]	20 g/10 ... 2000 Hz	■	■
Protection class 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 permitted

[2] To EN 60068-2-27

[3] To EN 60068-2-6

[4] With mating connector inserted

[5] 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. 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

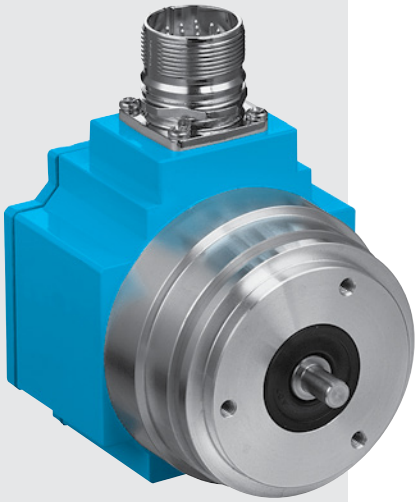
SRS/SRM50 Standalone; solid shaft Ø 10 mm; face mount flange

Model name	Part no.	Decription
SRS50-HWA0-K21	1037091	Single, 512 EEprom, connector
SRS50-HWV0-K21	1037093	Single, 512 EEprom, stranded cable
SRS50-HWA0-K22	1037092	Single, 2048 EEprom, connector
SRS50-HWV0-K22	1037094	Single, 2048 EEprom, stranded cable
SRM50-HWA0-K21	1037095	Multi, 512 EEprom, connector
SRM50-HWV0-K21	1037097	Multi, 512 EEprom, stranded cable
SRM50-HWA0-K22	1037096	Multi, 2048 EEprom, connector
SRM50-HWV0-K22	1037098	Multi, 2048 EEprom, stranded cable

1,024 sine/ cosine periods

Motor Feedback Systems

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



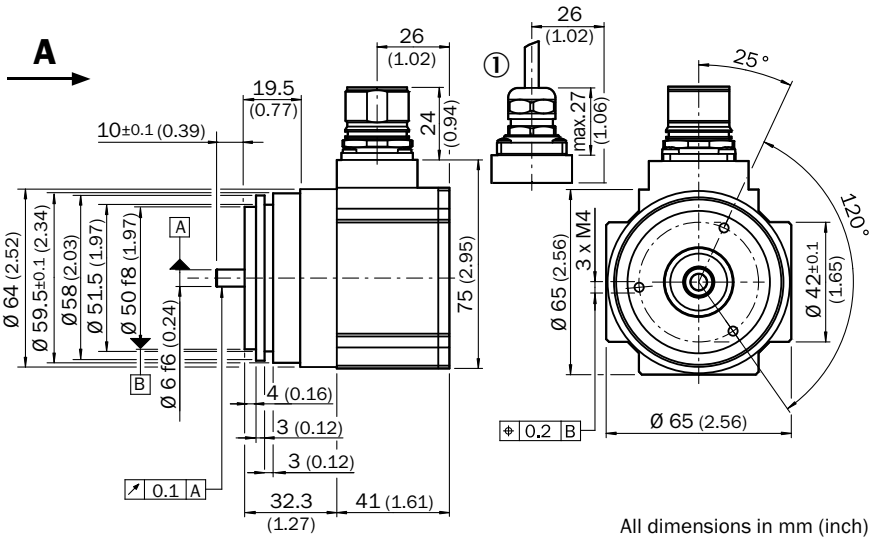
Product may differ from illustration

CE

Accessories

Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

Dimensional drawing SRS50/SRM50 Standalone, rectangular housing, servo flange



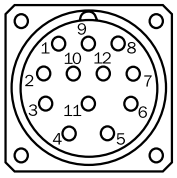
All dimensions in mm (inch)

① R = min. bending radius 40 mm

General tolerances according 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	Us	red	7 ... 12 V Supply voltage



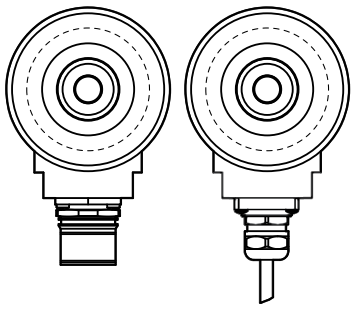
View of the plug-in face

Screen connection on connector housing

N. C. = Not connected

Type of connection

M23 Connector radial | Cable radial



Technical data to DIN 32878	Standalone, servo flange SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution	1,024		
Number of the absolute ascertainable revolutions			
	Single SRS: 1		
	Multi SRM: 4,096		
Dimensions	mm (see dimensional drawing)		
Mass	0.55 kg		
Moment of inertia to the rotor	25 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	0.3 angular seconds		
Error limits for evaluating the sine/cosine 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	6,000 min^{-1}		
Max. angular acceleration	0.2 x 10^6 rad/s^2		
Operating torque with shaft sealing ring	1 Ncm		
Starting torque with shaft sealing ring	1.5 Ncm		
Load capacity of shaft radial/axial	40 N/20 N		
Life of ball bearings	3.6 x 10^9 revolutions		
Working temperature range	–30 ... +85 °C		
Storage temperature range	–30 ... +90 °C		
Permissible relative humidity [1]	90 %		
Resistance			
To shocks [2]	30 g/11 ms		
To vibration [3]	20 g/10 ... 2000 Hz		
Protection class 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 permitted

[2] To EN 60068-2-27

[3] To EN 60068-2-6

[4] With mating connector inserted

[5] 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. 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

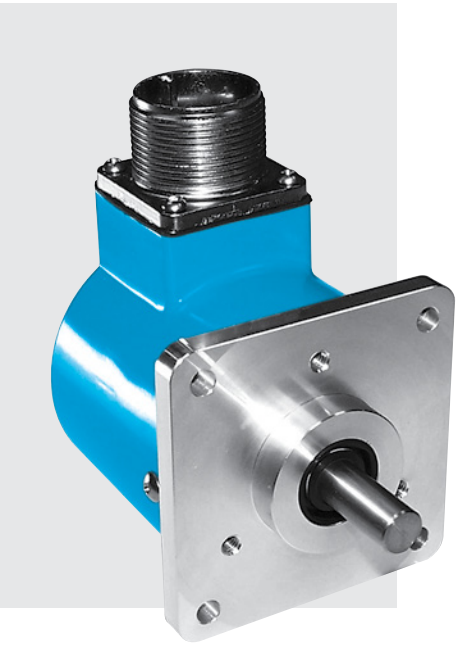
SRS/SRM50 Standalone; solid shaft Ø 6 mm; servo flange

Model name	Part no.	Description
SRS50-HXA0-K21	1037099	Single, 512 EEprom, connector
SRS50-HXV0-K21	1037101	Single, 512 EEprom, stranded cable
SRS50-HXA0-K22	1037100	Single, 2048 EEprom, connector
SRS50-HXV0-K22	1037102	Single, 2048 EEprom, stranded cable
SRM50-HXA0-K21	1037103	Multi, 512 EEprom, connector
SRM50-HXV0-K21	1037105	Multi, 512 EEprom, stranded cable
SRM50-HXA0-K22	1037104	Multi, 2048 EEprom, connector
SRM50-HXV0-K22	1037106	Multi, 2048 EEprom, stranded cable

1,024 sine/ cosine periods

Motor Feedback Systems

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



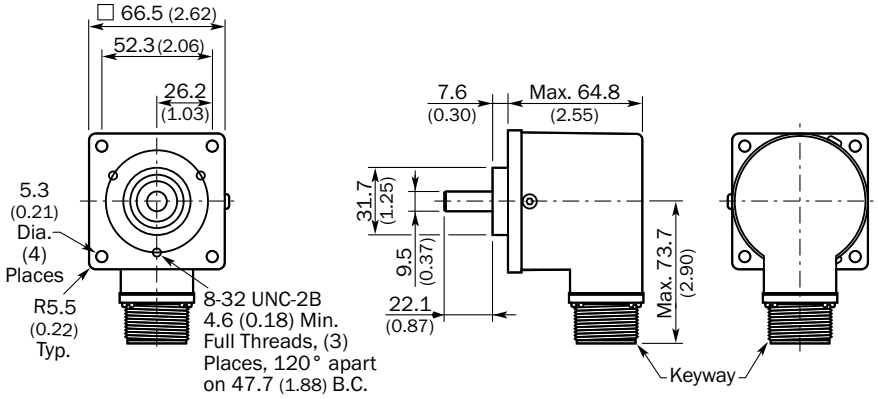
Product may differ from illustration

CE

Accessories

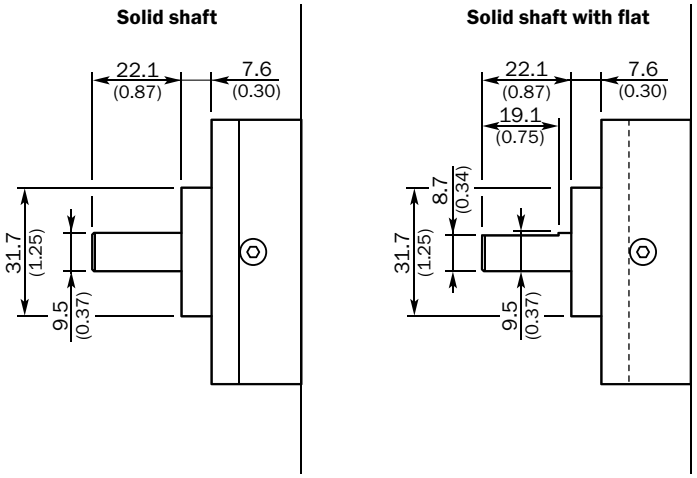
Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

Dimensional drawing SRS50/SRM50 Standalone, square mount flange



All dimensions in mm (inch)

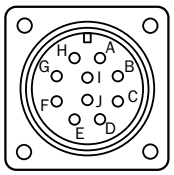
Dimensional drawing shaft options



All dimensions in mm (inch)

PIN and wire allocation

PIN	Signal	Wire colour	Explanation
A	+ U_S	red	7 ... 12 V Supply voltage
B	GND	blue	Ground connection
C	Ref SIN	brown	Process data channel
D	Ref COS	black	Process data channel
E	Data +	grey	RS-485-parameter channel
F	Data –	green	RS-485-parameter channel
G	SIN	white	Process data channel
H	COS	pink	Process data channel
I	N. C.		
J	Housing	Housing	



View of the plug-in face

Screen connection on connector housing

N. C. = Not connected

2012-03
Subject to change without notice

Technical data to DIN 32878	Standalone, square mount flange SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution	1,024	■	■
Number of the absolute ascertainable revolutions	Single SRS: 1	■	
	Multi SRM: 4,096		■
Dimensions	mm (see dimensional drawing)	■	■
Mass	0.48 kg	■	■
Moment of inertia to the rotor	28.8 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	0.3 angular seconds	■	■
Error limits for evaluating the sine/cosine 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 without shaft sealing ring	6,000 min^{-1}	■	■
Max. operating speed with shaft sealing ring	3,000 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	1.5 Ncm	■	■
Load capacity of shaft radial/axial	155 N/88 N	■	■
Life of ball bearings	3.6 x 10^9 revolutions	■	■
Working temperature range	0 ... 75 °C	■	■
Storage temperature range	–40 ... +85 °C	■	■
Permissible relative humidity [1]	90 %		
Resistance		■	■
To shocks [2]	100 g/10 ms	■	■
To vibration [3]	20 g/10 ... 2000 Hz	■	■
Protection class to IEC 60529 [4]	IP 66	■	■
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	■	■
Interface signals			
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential	■	■
Parameter channel = RS 485	Digital	■	■

[1] Condensation not permitted

[2] To EN 60068-2-27

[3] To EN 60068-2-6

[4] With mating connector inserted

[5] 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. 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/SRM50 Standalone; solid shaft Ø 3/8"; square mount flange 2,5"

Model name	Part no.	Description
SRS50-HTA0-K21	7127309	Single, solid shaft, connector MS/10
SRS50-HUA0-K21	7127310	Single, solid shaft with flat, connector MS/10
SRM50-HTA0-K21	7127313	Multi, solid shaft, connector MS/10
SRM50-HUA0-K21	7127311	Multi, solid shaft with flat, connector MS/10

1,024 sine/ cosine periods

Motor Feedback Systems

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

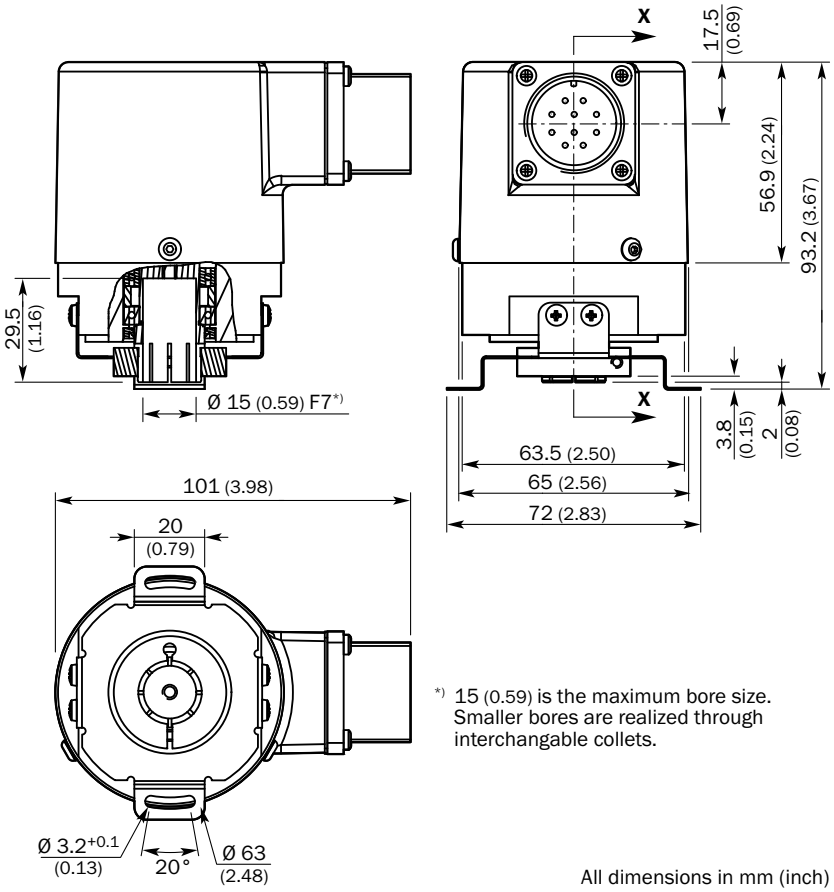
Product may differ from illustration

CE

Accessories

Connection systems (page 20)
Mounting systems (page 20)
Programming tool (page 20)

Dimensional drawing SRS50/SRM50 Standalone, blind hollow shaft

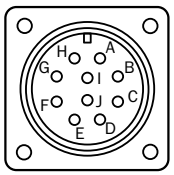


*) 15 (0.59) is the maximum bore size. Smaller bores are realized through interchangable collets.

All dimensions in mm (inch)

PIN and wire allocation

PIN	Signal	Wire colour	Explanation
A	+ U_S	red	7 ... 12 V Supply voltage
B	GND	blue	Ground connection
C	Ref SIN	brown	Process data channel
D	Ref COS	black	Process data channel
E	Data +	grey	RS-485-parameter channel
F	Data –	green	RS-485-parameter channel
G	SIN	white	Process data channel
H	COS	pink	Process data channel
I	N. C.		
J	Housing	Housing	



View of the plug-in face

Screen connection on connector housing

N. C. = Not connected

Technical data to DIN 32878	Standalone, blind hollow shaft SRS/SRM50	SRS	SRM
Number of sine/cosine periods per revolution	1,024		
Number of the absolute ascertainable revolutions	Single SRS: 1		
	Multi SRM: 4,096		
Dimensions	mm (see dimensional drawing)		
Mass	0.48 kg		
Moment of inertia to the rotor	50 gcm^2 max.		
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	0.3 angular seconds		
Error limits for evaluating the sine/cosine 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	3.000 min^{-1}		
Max. operating speed	3.000 min^{-1}		
Max. angular acceleration	5 x 10^5 rad/s^2		
Max. operating torque	1.8 Ncm		
Starting torque with shaft sealing ring	2.6 Ncm		
Allowable runout			
static/dynamic radial	± 0.3/± 0.1 mm		
static/dynamic axial	± 0.5/± 0.2 mm		
Working temperature range	0 ... 75 °C		
Storage temperature range	–40 ... +85 °C		
Permissible relative humidity [1]	90 %		
Resistance			
To shocks [2]	100 g/10 ms		
To vibration [3]	20 g/10 ... 2000 Hz		
Protection class to IEC 60529 [4]	IP 66		
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		
Interface signals			
Process data channel = SIN, REFSIN, COS, REFCOS	Analogue, differential		
Parameter channel = RS 485	Digital		

Ordering information		
SRS/SRM50 Standalone; blind hollow saft Ø 15 mm		
Model name	**Part no.**	**Description**
SRS50-HPA0-K21	7127312	Single, Aufsteckhohlwelle, Stecker MS/10
SRM50-HPA0-K21	7127314	Multi, Aufsteckhohlwelle, Stecker MS/10

[1] Condensation not permitted

[2] To EN 60068-2-27

[3] To EN 60068-2-6

[4] With mating connector inserted

[5] 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. 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.

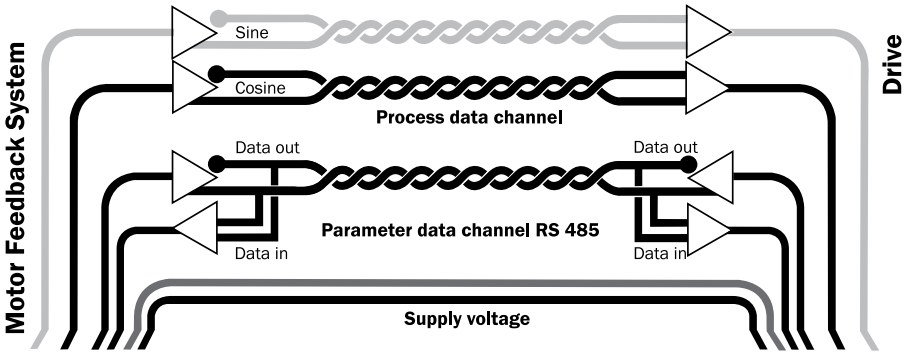
[6] If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.

Collets		
Model name	**Part no.**	**Size**
SPZ-006-AD-A	2029174	6 mm
SPZ-1E4-AD-A	2029175	1/4”
SPZ-008-AD-A	2029176	8 mm
SPZ-3E8-AD-A	2029177	3/8”
SPZ-010-AD-A	2029178	10 mm
SPZ-012-AD-A	2029179	12 mm
SPZ-1E2-AD-A	2029180	1/2”
Attention: Please order the Collet with required diameter separately.		

HIPERFACE® by SICK

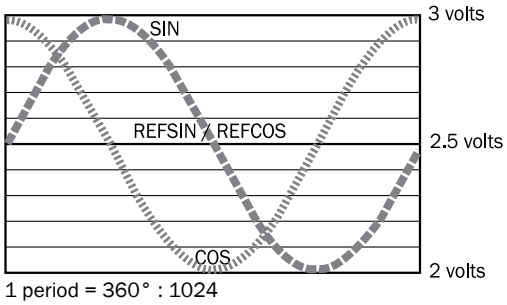
Electrical interface

- 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"



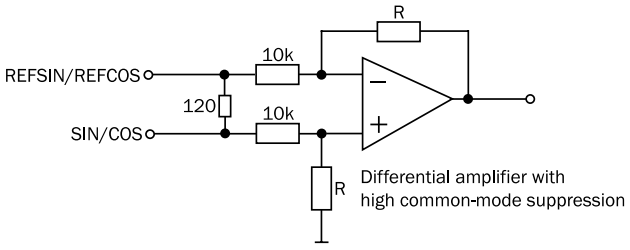
1 period = 360° : 1024

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.

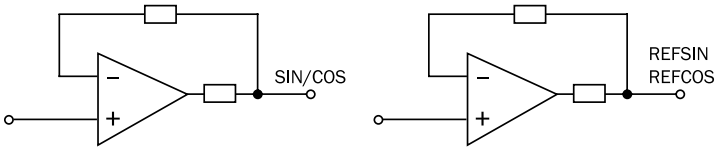
Sophisticated technology guarantees stable amplitudes of the analogue signals across all specified environmental conditions, with a maximum variation of only 20%.

Characteristics applicable to all permissible environmental conditions	
Signal	**Value/Units**
Signal peak, peak V_{ss} of SIN, COS	0.9 ... 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



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

HIPERFACE® by SICK

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 (5 bits per sine/cosine period)		15 bits	27 bits
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] 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.

Overview of status messages				
Error type	Statuscode	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^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	•	•

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

Dimensional drawings and ordering information

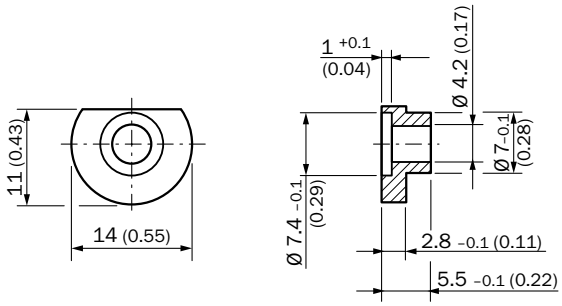
Accessories for SRS50/SRM50 Standalone

Programming Tool for HIPERFACE® devices

Model name	Part no.	Motor Feedback System
PGT-03-S	1034252	SRS50/SRM50 Standalone

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

Model name	Part no.
BEF-WK-SF	2029166

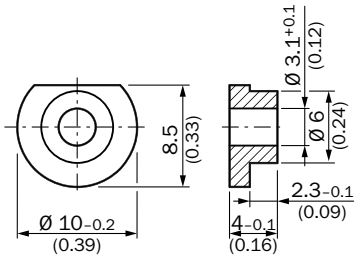


All dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

Servo clamp small, set (contents 3 off)

Model name	Part no.
BEF-WK-RESOL	2039082

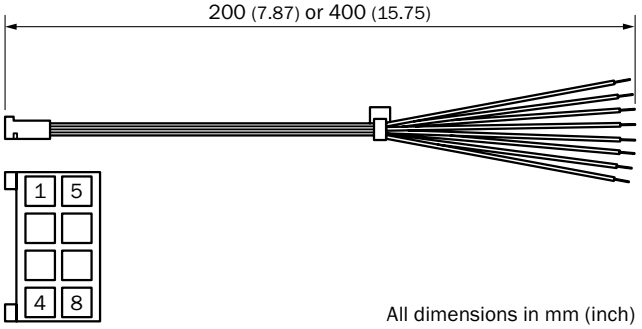


All dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

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

Model name	Part no.	Contacts	Wire length
DOL-0B08-G0M2XB1	2031081	8	0.2 m
DOL-0B08-G0M4XB1	2031083	8	0.4 m



All dimensions in mm (inch)

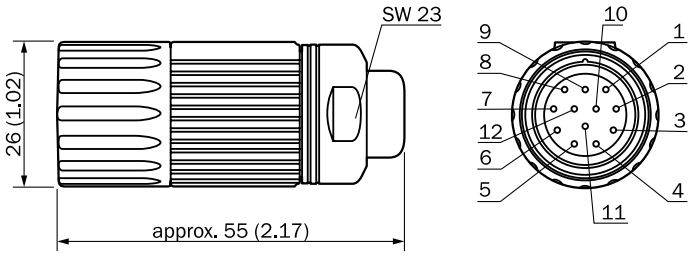
HIPERFACE® cable, 8 wires, supplied by the metre 4 x 2 x 0.15 mm2, screened, flexible

Model name	Part no.	Cores
LTG-2708-MW	6028361	8

Dimensional drawings and ordering information

Connector M23 female, 12-pin, straight, screened

Model name	Part no.	Contacts
DOS-2312-G	6027538	12

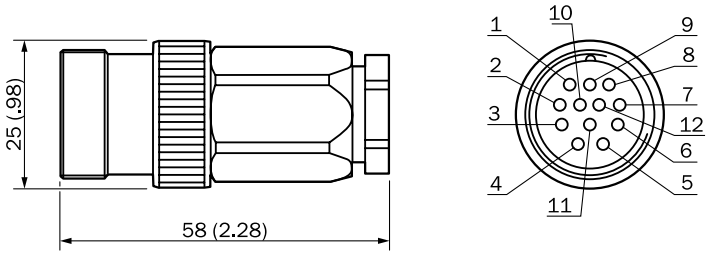


All dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

Connector M23 male, 12-pin, straight, screened

Model name	Part no.	Contacts
STE-2312-G	6027537	12



All dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

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

Model name	Part no.	Contacts	Cable 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	10.0 m
DOL-2308-G15MJB2	2031073	12	15.0 m

Mating Connectors fit in for MS/10

Model name	Part no.	PIN
DOS-MS10-G	7102129	10-pin

Cable and connector assembly MS/10, 10-pin, straight, cable 8-core

Model name	Part no.	Cable length
DOL-MS10-G1M5MA3	7102160	1.5 m
DOL-MS10-G03MMA3	7102161	3.0 m
DOL-MS10-G05MMA3	7102162	5.0 m
DOL-MS10-G10MMA3	7102163	10.0 m
DOL-MS10-G20MMA3	7102164	20.0 m
DOL-MS10-G30MMA3	7102165	30.0 m

Accessories for SRS50/SRM50 Standalone

Interchangeable collets for blind hollow shaft

Model name	Part no.	Size
SPZ-006-AD-A	2029174	6 mm
SPZ-1E4-AD-A	2029175	1/4”
SPZ-008-AD-A	2029176	8 mm
SPZ-3E8-AD-A	2029177	3/8”
SPZ-010-AD-A	2029178	10 mm
SPZ-012-AD-A	2029179	12 mm
SPZ-1E2-AD-A	2029180	1/2”

8012889/2012-03-21 · SF (2012-03) · A4 2c int37

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