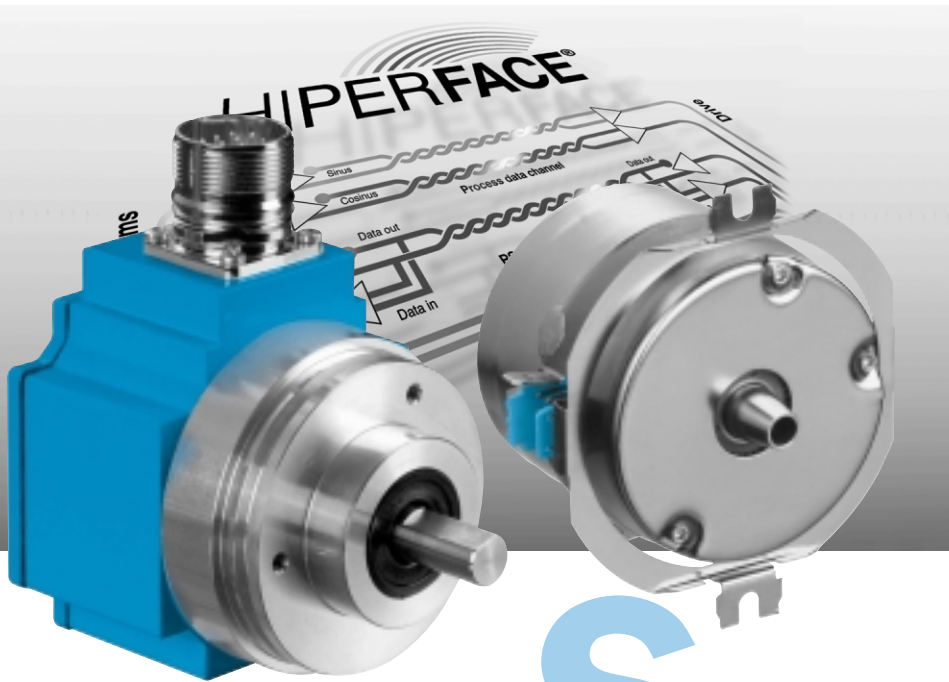



# SinCos® SRS 50, SRM 50, SRS 60, SRM 60 SRS 50 Standalone, SRM 50 Standalone: Motor Feedback Systems with HIPERFACE® - Interface for Servo Motors

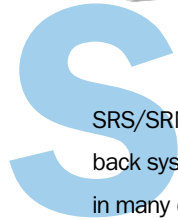


Select the motor feedback system to suit your individual requirements.

Possible product variations:

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

	<b>1,024 sine/ cosine periods</b>
<b>Motor Feedback Systems</b>	




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.

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



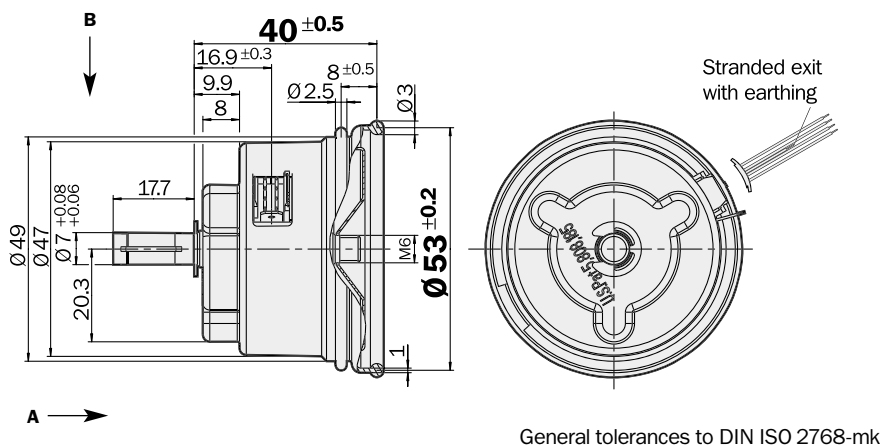


**1,024 sine/cosine periods**

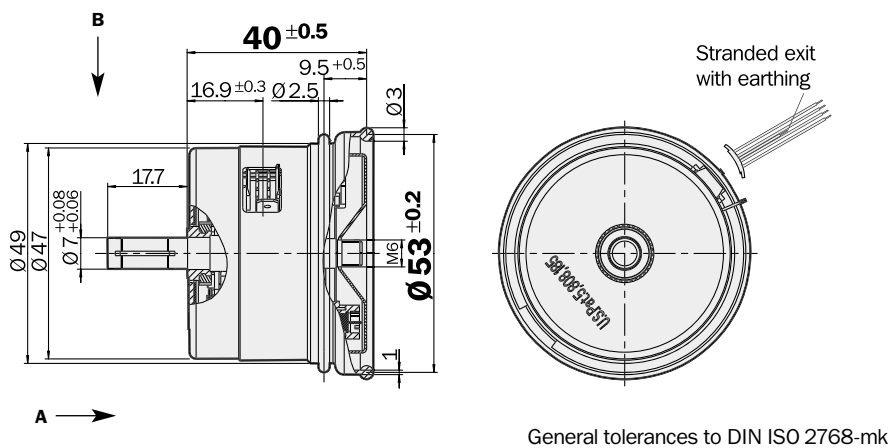
Motor Feedback Systems

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

Dimensional drawing SRS 50, rubber support Ø 50



Dimensional drawing SRM 50, rubber support Ø 50

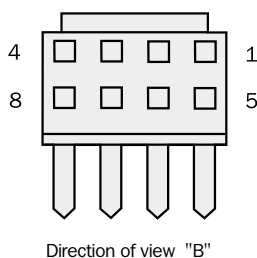


**PIN and wire allocation**

PIN	Signal	Colour of Wires	Explanation
1	U <sub>s</sub>	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 SRS/SRM 50	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.2 kg										
<b>Inertial rotor moment</b>		10 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>												
		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>												
		0.3 angular seconds										
<b>Total number of steps</b>												
	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>												
		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>												
		6,000 min <sup>-1</sup>										
<b>Max. operating speed</b>												
		12,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>												
		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque</b>												
		0.2 Ncm										
<b>Starting torque</b>												
		0.4 Ncm										
<b>Permissible shaft movement</b>												
static	radial/axial	± 0.5 mm/± 0.75 mm										
dynamic	radial/axial	± 0.1 mm/± 0.2 mm										
<b>Angular motion, perpendicular to the rotational axis</b>												
static		± 0.005 mm/mm										
dynamic		± 0.0025 mm/mm										
<b>Life of ball bearings</b>												
		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>												
		- 20 ... + 115 °C										
<b>Storage temperature range</b>												
		- 40 ... + 125 °C										
<b>Permissible relative humidity <sup>1)</sup></b>												
		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		100/10 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>												
		IP 40										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>												
		7 ... 12 V										
<b>Recommended supply voltage</b>												
		8 V										
<b>Max. operating current, no load</b>												
		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted


<sup>5)</sup> To DIN EN 61000-6-2 and DIN 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.

#### Ordering information

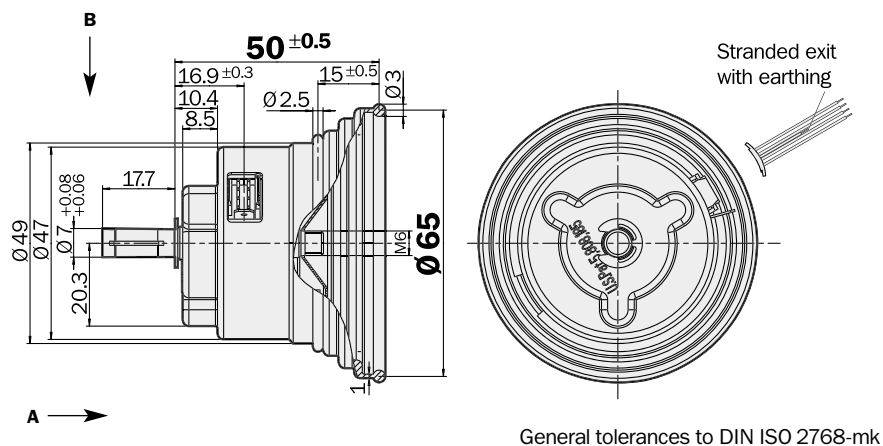
##### SRS/SRM 50; plug-in shaft Ø 7mm; rubber support

Type	Part no.	Description
SRS50-HAA0-K01	1 034 170	Single, 512 EEprom, connector
SRS50-HAV0-K01	1 034 174	Single, 512 EEprom, stranded cable
SRS50-HAA0-K02	1 034 171	Single, 2048 EEprom, connector
SRS50-HAV0-K02	1 034 175	Single, 2048 EEprom, stranded cable
SRM50-HAA0-K01	1 034 104	Multi, 512 EEprom, connector
SRM50-HAV0-K01	1 034 109	Multi, 512 EEprom, stranded cable
SRM50-HAA0-K02	1 034 105	Multi, 2048 EEprom, connector
SRM50-HAV0-K02	1 034 110	Multi, 2048 EEprom, stranded cable

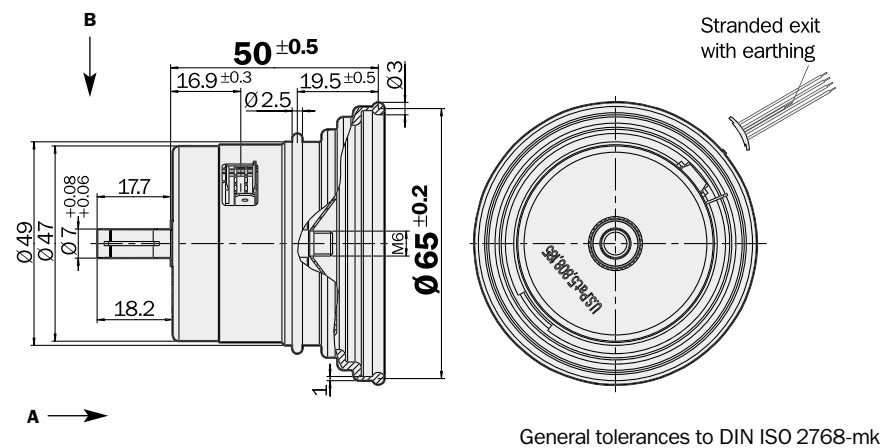
 **1,024 sine/cosine periods**  
**Motor Feedback Systems**

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

**Dimensional drawing SRS 60, rubber support Ø 60**



**Dimensional drawing SRM 60, rubber support Ø 60**

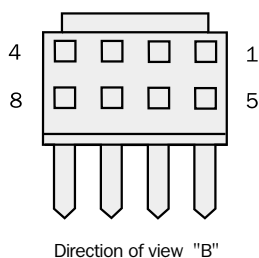


**PIN and wire allocation**

PIN	Signal	Colour of Wires	Explanation
1	U <sub>s</sub>	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 SRS/SRM 60	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.2 kg										
<b>Inertial rotor moment</b>		10 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>												
		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>												
		0.3 angular seconds										
<b>Total number of steps</b>	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>												
		6,000 min <sup>-1</sup>										
<b>Max. operating speed</b>		12,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque</b>		0.2 Ncm										
<b>Starting torque</b>		0.4 Ncm										
<b>Permissible shaft movement</b>												
static	radial/axial	± 0.5 mm/± 0.75 mm										
dynamic	radial/axial	± 0.1 mm/± 0.2 mm										
<b>Angular motion, perpendicular to the rotational axis</b>												
static		± 0.005 mm/mm										
dynamic		± 0.0025 mm/mm										
<b>Life of ball bearings</b>		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>		- 20 ... + 115 °C										
<b>Storage temperature range</b>		- 40 ... + 125 °C										
<b>Permissible relative humidity <sup>1)</sup></b>		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		100/10 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>		IP 40										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>		7 ... 12 V										
<b>Recommended supply voltage</b>		8 V										
<b>Max. operating current, no load</b>		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted


<sup>5)</sup> To DIN EN 61000-6-2 and DIN 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.

#### Ordering information

##### SRS/SRM 60; plug-in shaft Ø 7mm; rubber support

Type	Part no.	Description
SRS60-HAA0-K01	1 034 213	Single, 512 EEPROM, connector
SRS60-HAV0-K01	1 034 215	Single, 512 EEPROM, stranded cable
SRS60-HAA0-K02	1 034 214	Single, 2048 EEPROM, connector
SRS60-HAV0-K02	1 034 216	Single, 2048 EEPROM, stranded cable
SRM60-HAA0-K01	1 034 153	Multi, 512 EEPROM, connector
SRM60-HAV0-K01	1 034 155	Multi, 512 EEPROM, stranded cable
SRM60-HAA0-K02	1 034 154	Multi, 2048 EEPROM, connector
SRM60-HAV0-K02	1 034 156	Multi, 2048 EEPROM, stranded cable

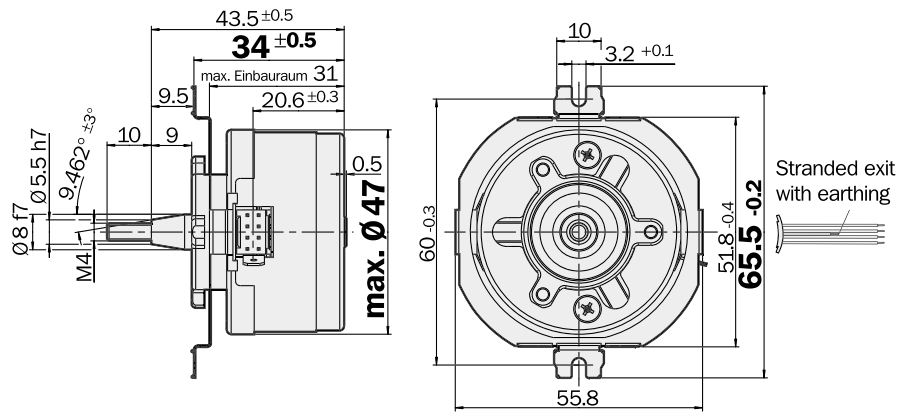


**1,024 sine/cosine periods**

Motor Feedback Systems

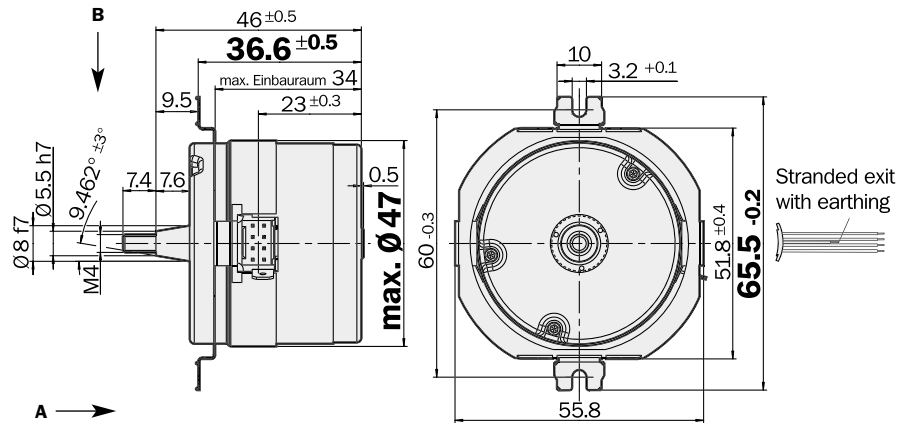
- 1,024 sine/cosine periods per revolution
- Absolute position with a resolution of 32,768 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

Dimensional drawing SRS 50, spring mounting plate Ø 66

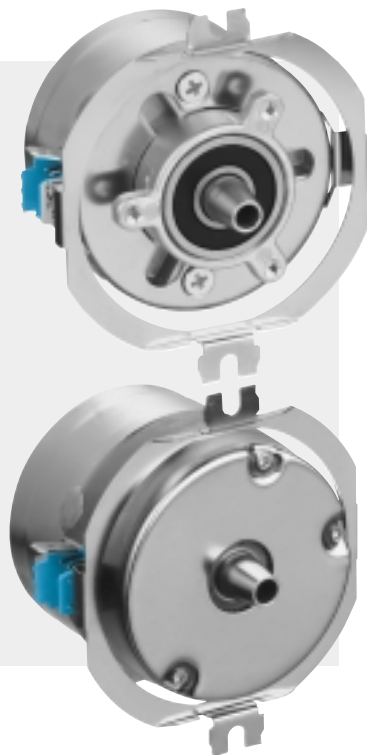


General tolerances to DIN ISO 2768-mk

Dimensional drawing SRM 50, spring mounting plate Ø 66



General tolerances to DIN ISO 2768-mk

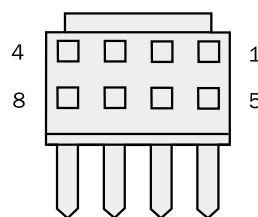


**PIN and wire allocation**

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



**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.

$U_s$  and GND are internally connected to the housing, through 2.2 nF capacitors.

Technical Data		Tapered Shaft SRS/SRM 50	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.2 kg										
<b>Inertial rotor moment</b>		10 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>												
		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>												
		0.3 angular seconds										
<b>Total number of steps</b>												
	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>												
		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>												
		6,000 min <sup>-1</sup>										
<b>Max. operating speed</b>												
		12,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>												
		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque</b>												
		0.2 Ncm										
<b>Starting torque</b>												
		0.4 Ncm										
<b>Permissible shaft movement</b>												
static	radial/axial	± 0.5 mm/± 0.75 mm										
dynamic	radial/axial	± 0.1 mm/± 0.2 mm										
<b>Angular motion, perpendicular to the rotational axis</b>												
static		± 0.005 mm/mm										
dynamic		± 0.0025 mm/mm										
<b>Life of ball bearings</b>												
		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>												
		- 20 ... + 115 °C										
<b>Storage temperature range</b>												
		- 40 ... + 125 °C										
<b>Permissible relative humidity <sup>1)</sup></b>												
		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		100/10 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>												
		IP 40										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>												
		7 ... 12 V										
<b>Recommended supply voltage</b>												
		8 V										
<b>Max. operating current, no load</b>												
		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted


<sup>5)</sup> To DIN EN 61000-6-2 and DIN 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.

#### Ordering information

##### SRS/SRM 50; tapered shaft; spring mounting plate

Type	Part no.	Description
SRS50-HFA0-K01	1 034 222	Single, 512 EEPROM, connector
SRS50-HFV0-K01	1 034 185	Single, 512 EEPROM, stranded cable
SRS50-HFA0-K02	1 034 182	Single, 2048 EEPROM, connector
SRS50-HFV0-K02	1 034 186	Single, 2048 EEPROM, stranded cable
SRM50-HFA0-K01	1 034 118	Multi, 512 EEPROM, connector
SRM50-HFV0-K01	1 034 122	Multi, 512 EEPROM, stranded cable
SRM50-HFA0-K02	1 034 119	Multi, 2048 EEPROM, connector
SRM50-HFV0-K02	1 034 123	Multi, 2048 EEPROM, stranded cable

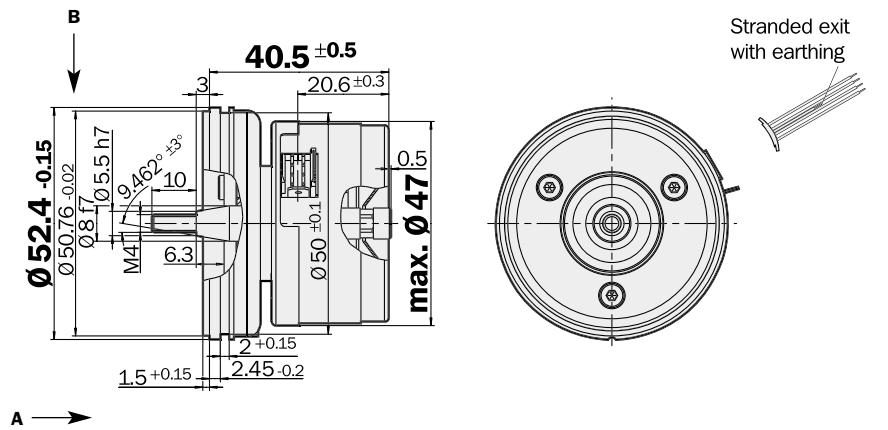


**1,024 sine/cosine periods**

Motor Feedback Systems

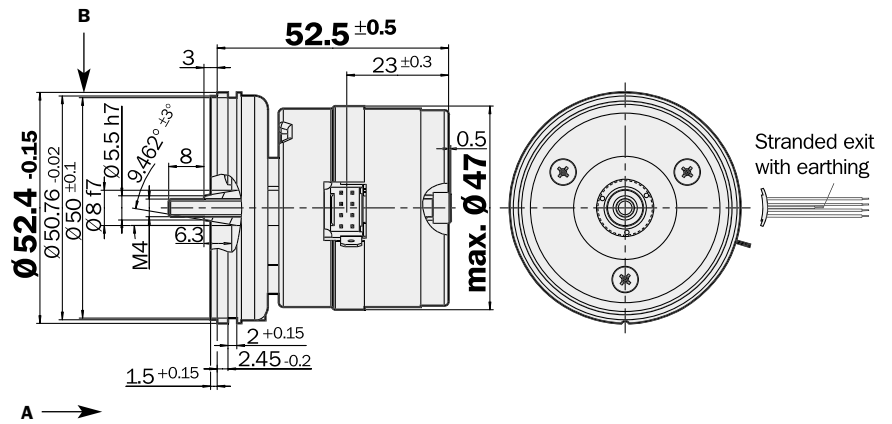
- 1,024 sine/cosine periods per revolution
- Absolute position with a resolution of 32,768 steps per revolution
- 4,096 revolutions can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

**Dimensional drawing SRS 50, resolver support Ø 52**



General tolerances to DIN ISO 2768-mk

**Dimensional drawing SRM 50, resolver support Ø 52**



General tolerances to DIN ISO 2768-mk

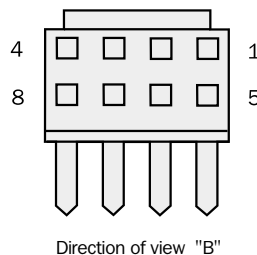


**PIN and wire allocation**

PIN	Signal	Colour of Wires	Explanation
1	U <sub>s</sub>	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



Direction of view "B"



Technical Data		Tapered Shaft SRS/SRM 50	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.2 kg										
<b>Inertial rotor moment</b>		10 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>		0.3 angular seconds										
<b>Total number of steps</b>	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>												
<b>Max. operating speed</b>		6,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		12,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque</b>		0.2 Ncm										
<b>Starting torque</b>		0.4 Ncm										
<b>Permissible shaft movement</b>												
static	radial/axial	± 0.5 mm/± 0.75 mm										
dynamic	radial/axial	± 0.1 mm/± 0.2 mm										
<b>Angular motion, perpendicular to the rotational axis</b>												
static		± 0.005 mm/mm										
dynamic		± 0.0025 mm/mm										
<b>Life of ball bearings</b>		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>		- 20 ... + 115 °C										
<b>Storage temperature range</b>		- 40 ... + 125 °C										
<b>Permissible relative humidity <sup>1)</sup></b>		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		100/10 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>		IP 40										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>		7 ... 12 V										
<b>Recommended supply voltage</b>		8 V										
<b>Max. operating current, no load</b>		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted


<sup>5)</sup> To DIN EN 61000-6-2 and DIN 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.

#### Ordering information

##### SRS/SRM 50; tapered shaft; resolver support

Type	Part no.	Description
SRS50-HGA0-K01	1 034 187	Single, 512 EEPROM, , connector
SRS50-HGV0-K01	1 034 189	Single, 512 EEPROM, stranded cable
SRS50-HGA0-K02	1 034 188	Single, 2048 EEPROM, connector
SRS50-HGV0-K02	1 034 190	Single, 2048 EEPROM, stranded cable
SRM50-HGA0-K01	1 034 124	Multi, 512 EEPROM, , connector
SRM50-HGV0-K01	1 034 127	Multi, 512 EEPROM, stranded cable
SRM50-HGA0-K02	1 034 125	Multi, 2048 EEPROM, connector
SRM50-HGV0-K02	1 034 128	Multi, 2048 EEPROM, stranded cable

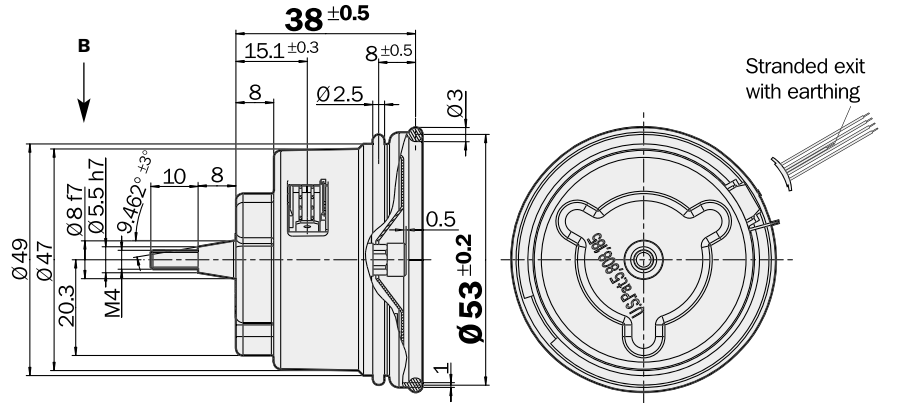
 **1,024 sine/cosine periods**

Motor Feedback Systems

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

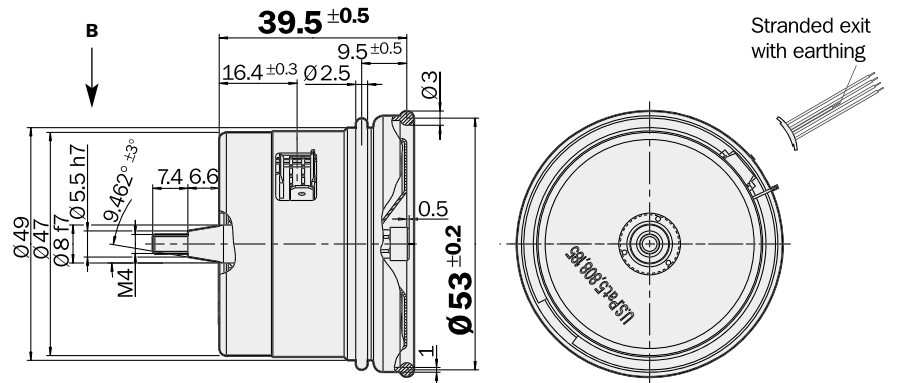


**Dimensional drawing SRS 50, rubber support Ø 50**



General tolerances to DIN ISO 2768-mk

**Dimensional drawing SRM 50, rubber support Ø 50**

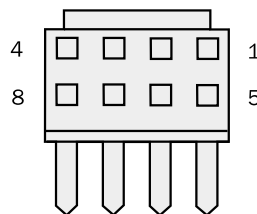


General tolerances to DIN ISO 2768-mk

**PIN and wire allocation**

PIN	Signal	Colour of Wires	Explanation
1	U <sub>s</sub>	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.



Direction of view "B"

Accessories
Connection technology
Fixing technology
Programming tool

Technical Data		Tapered Shaft SRS/SRM 50	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.2 kg										
<b>Inertial rotor moment</b>		10 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>		0.3 angular seconds										
<b>Total number of steps</b>	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>												
<b>Max. operating speed</b>		6,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		12,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque</b>		0.2 Ncm										
<b>Starting torque</b>		0.4 Ncm										
<b>Permissible shaft movement</b>												
static	radial/axial	± 0.5 mm/± 0.75 mm										
dynamic	radial/axial	± 0.1 mm/± 0.2 mm										
<b>Angular motion, perpendicular to the rotational axis</b>												
static		± 0.005 mm/mm										
dynamic		± 0.0025 mm/mm										
<b>Life of ball bearings</b>		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>		- 20 ... + 115 °C										
<b>Storage temperature range</b>		- 40 ... + 125 °C										
<b>Permissible relative humidity <sup>1)</sup></b>		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		100/10 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>		IP 40										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>		7 ... 12 V										
<b>Recommended supply voltage</b>		8 V										
<b>Max. operating current, no load</b>		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted


<sup>5)</sup> To DIN EN 61000-6-2 and DIN 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.

#### Ordering Information

##### SRS/SRM 50; tapered shaft; rubber support Ø 50 mm

Type	Part no.	Description
SRS50-HEA0-K01	1 034 176	Single, 512 EEprom, connector
SRS50-HEV0-K01	1 034 178	Single, 512 EEprom, stranded cable
SRS50-HEA0-K02	1 034 177	Single, 2048 EEprom, connector
SRS50-HEV0-K02	1 034 179	Single, 2048 EEprom, stranded cable
SRM50-HEA0-K01	1 034 111	Multi, 512 EEprom, connector
SRM50-HEV0-K01	1 034 114	Multi, 512 EEprom, stranded cable
SRM50-HEA0-K02	1 034 112	Multi, 2048 EEprom, connector
SRM50-HEV0-K02	1 034 115	Multi, 2048 EEprom, stranded cable



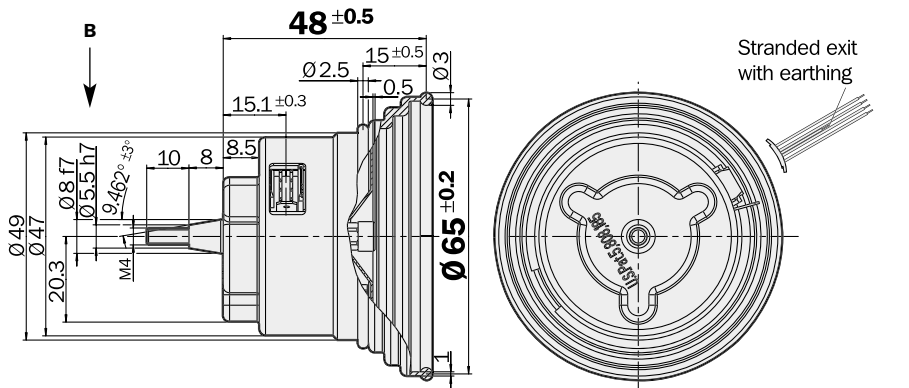
**1,024 sine/  
cosine periods**

Motor Feedback Systems

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

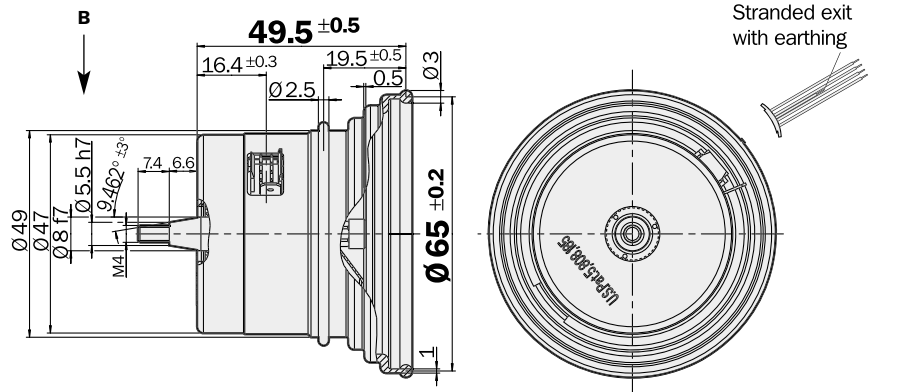


Dimensional drawing SRS 60, rubber support Ø 60



General tolerances to DIN ISO 2768-mk

Dimensional drawing SRM 60, rubber support Ø 60



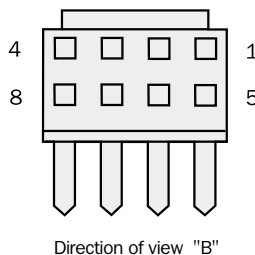
General tolerances to DIN ISO 2768-mk

**PIN and wire allocation**

PIN	Signal	Colour of Wires	Explanation
1	U <sub>s</sub>	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		Tapered Shaft SRS/SRM 60	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.2 kg										
<b>Inertial rotor moment</b>		10 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>												
		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>												
		0.3 angular seconds										
<b>Total number of steps</b>												
	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>												
		6,000 min <sup>-1</sup>										
<b>Max. operating speed</b>		12,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque</b>		0.2 Ncm										
<b>Starting torque</b>		0.4 Ncm										
<b>Permissible shaft movement</b>												
static	radial/axial	± 0.5 mm/± 0.75 mm										
dynamic	radial/axial	± 0.1 mm/± 0.2 mm										
<b>Angular motion, perpendicular to the rotational axis</b>												
static		± 0.005 mm/mm										
dynamic		± 0.0025 mm/mm										
<b>Life of ball bearings</b>		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>		- 20 ... + 115 °C										
<b>Storage temperature range</b>		- 40 ... + 125 °C										
<b>Permissible relative humidity <sup>1)</sup></b>		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		100/10 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>		IP 40										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>		7 ... 12 V										
<b>Recommended supply voltage</b>		8 V										
<b>Max. operating current, no load</b>		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted


<sup>5)</sup> To DIN EN 61000-6-2 and DIN 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.

#### Ordering information

##### SRS/SRM 60; tapered shaft; rubber support Ø 60 mm

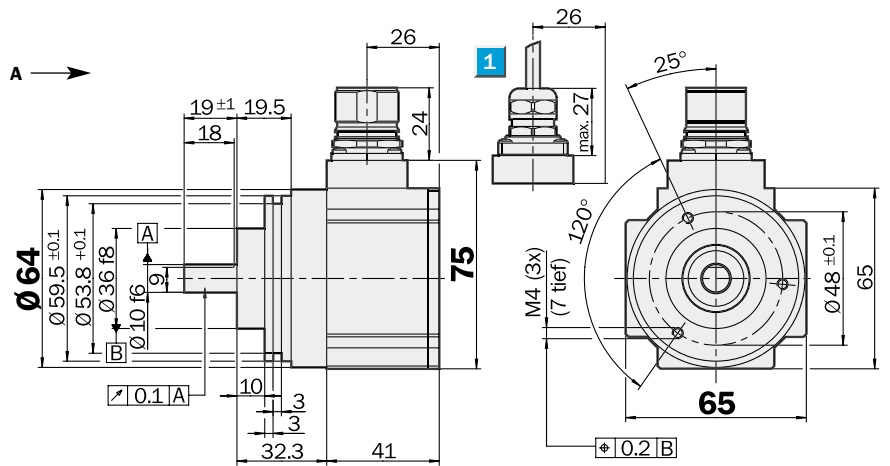
Type	Part no.	Description
SRS60-HEA0-K01	1 034 217	Single, 512 EEprom, connector
SRS60-HEV0-K01	1 034 220	Single, 512 EEprom, stranded cable
SRS60-HEA0-K02	1 034 218	Single, 2048 EEprom, connector
SRS60-HEV0-K02	1 034 221	Single, 2048 EEprom, stranded cable
SRM60-HEA0-K01	1 034 157	Multi, 512 EEprom, connector
SRM60-HEV0-K01	1 034 160	Multi, 512 EEprom, stranded cable
SRM60-HEA0-K02	1 034 158	Multi, 2048 EEprom, connector
SRM60-HEV0-K02	1 034 161	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 can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

**Dimensional drawing SRS 50 standalone, rectangular housing, face mount flange**

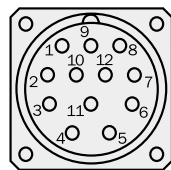
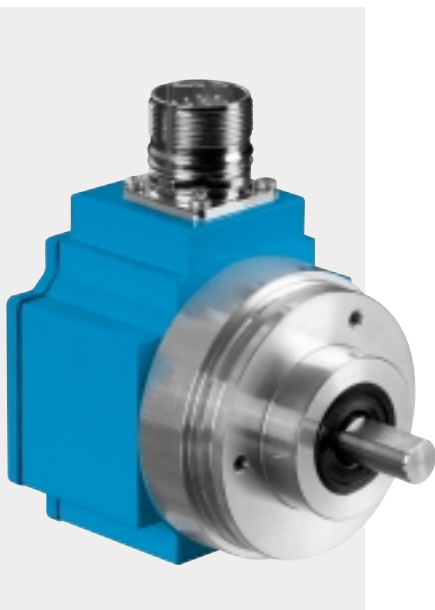


**1** R = min. bending radius 40 mm

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	N. C.	–	N. C.
10	GND	blue	Ground connection
11	N. C.	–	N. C.
12	U <sub>s</sub>	red	7 ... 12 V Supply voltage



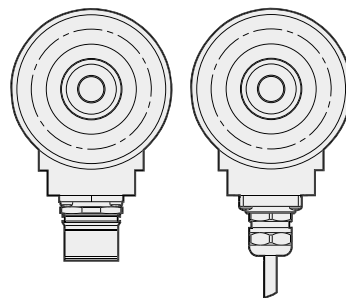
View of the plug-in face

Screen connection on connector housing

N. C. = Not connected

**Type of connection**

- Connector radial    Cable radial



**Accessories**

Connection technology
Fixing technology
Programming tool



Technical Data		Standalone, Face Mount Flange SRS/SRM 50	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.550 kg										
<b>Inertial rotor moment</b>		25 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>		0.3 angular seconds										
<b>Total number of steps</b>	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>		6,000 min <sup>-1</sup>										
<b>Max. operating speed</b>		6,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque with shaft sealing ring</b>		1 Ncm										
<b>Starting torque with shaft sealing ring</b>		1,5 Ncm										
<b>Load capacity of shaft</b>	radial/axial	40 N/20 N										
<b>Life of ball bearings</b>		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>		- 20 ... + 85 °C										
<b>Storage temperature range</b>		- 30 ... + 90 °C										
<b>Permissible relative humidity <sup>1)</sup></b>		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		30/11 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>		IP 65										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>		7 ... 12 V										
<b>Recommended supply voltage</b>		8 V										
<b>Max. operating current, no load</b>		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6


<sup>4)</sup> With mating connector inserted

<sup>5)</sup> To DIN EN 61000-6-2 and DIN 61000-6-3

#### Ordering information

##### SRS/SRM 50 standalone; solid shaft Ø 10 mm; clamping flange

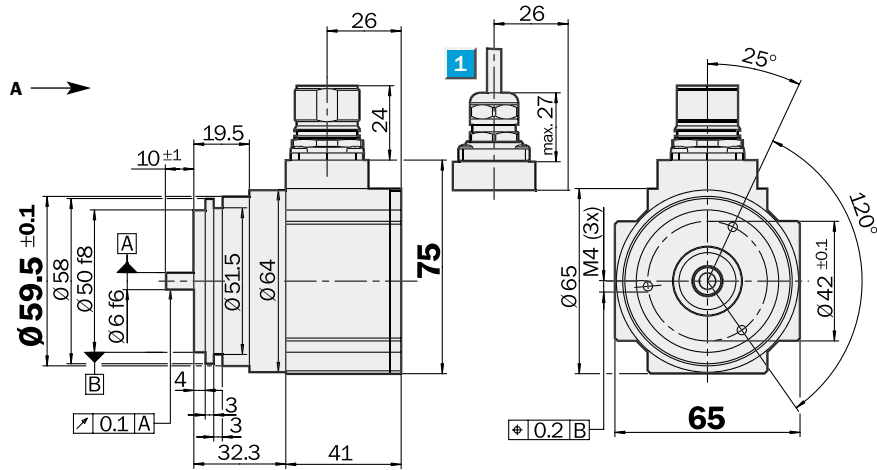
Type	Part no.	Description
SRS50-HWA0-K01	1 034 192	Single, 512 EEprom, connector
SRS50-HWV0-K01	1 034 194	Single, 512 EEprom, cable 1,5 m
SRS50-HWA0-K02	1 034 193	Single, 2048 EEprom, connector
SRS50-HWV0-K02	1 034 195	Single, 2048 EEprom, cable 1,5 m
SRM50-HWA0-K01	1 034 130	Multi, 512 EEprom, connector
SRM50-HWV0-K01	1 034 133	Multi, 512 EEprom, cable 1,5 m
SRM50-HWA0-K02	1 034 131	Multi, 2048 EEprom, connector
SRM50-HWV0-K02	1 034 134	Multi, 2048 EEprom, cable 1,5 m

 **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 can be measured (Multiturn)
- Programming of the positional value
- Electronic type label

**Dimensional drawing SRS 50 standalone, rectangular housing, servo flange**

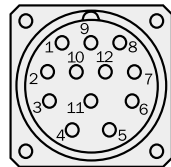


**1** R = min. bending radius 40 mm

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	N. C.	–	N. C.
10	GND	blue	Ground connection
11	N. C.	–	N. C.
12	U <sub>s</sub>	red	7 ... 12 V Supply voltage



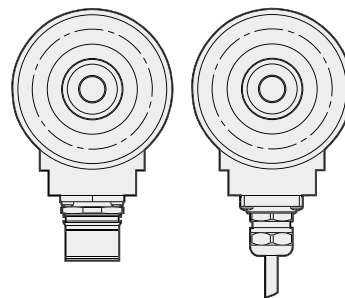
View of the plug-in face

Screen connection on connector housing

N. C. = Not connected

**Type of connection**

Connector radial | Cable radial



Accessories
Connection technology
Fixing technology
Programming tool





Technical Data		Standalone, Servo Flange SRS/SRM 50	SRS	SRM								
<b>Number of sine/cosine periods per revolution</b>		1,024										
<b>Dimensions</b>		mm (see dimensional drawing)										
<b>Mass</b>		0.550 kg										
<b>Inertial rotor moment</b>		25 gcm <sup>2</sup>										
<b>Type of code for the absolute value</b>		Binary										
<b>Code sequence for clockwise shaft rotation, looking in direction "A" (see dimensional drawing)</b>		Increasing										
<b>Measurement step after generating arctan with 12 bit resolution</b>		0.3 angular seconds										
<b>Total number of steps</b>	Single SRS	32,768										
	Multi SRM	134,217,728 = 32,768 x 4,096										
<b>Error limits for the digital absolute value</b>												
via RS 485		± 90 angular seconds										
<b>Error limits for evaluating the "1,024" signals,</b>												
integral non-linearity		± 45 angular seconds										
<b>Non-linearity within a sine/cosine period</b>												
differential non-linearity		± 7 angular seconds										
<b>Output frequency for sine/cosine signals</b>		0 ... 200 kHz										
<b>Working speed up to which the absolute position can be reliably produced</b>		6,000 min <sup>-1</sup>										
<b>Max. operating speed</b>		6,000 min <sup>-1</sup>										
<b>Max. angular acceleration</b>		0.2 x 10 <sup>6</sup> rad/s <sup>2</sup>										
<b>Operating torque with shaft sealing ring</b>		1 Ncm										
<b>Starting torque with shaft sealing ring</b>		1.5 Ncm										
<b>Load capacity of shaft</b>	radial/axial	40 N/20 N										
<b>Life of ball bearings</b>		3.6 x 10 <sup>9</sup> rotations										
<b>Working temperature range</b>		- 20 ... + 85 °C										
<b>Storage temperature range</b>		- 30 ... + 90 °C										
<b>Permissible relative humidity <sup>1)</sup></b>		90 %										
<b>Resistance</b>												
to shocks <sup>2)</sup>		30/11 g/ms										
to vibration <sup>3)</sup>		20/10 ... 2000 g/Hz										
<b>Protection to IEC 60529 <sup>4)</sup></b>		IP 65										
<b>EMC <sup>5)</sup></b>												
<b>Operating voltage range</b>		7 ... 12 V										
<b>Recommended supply voltage</b>		8 V										
<b>Max. operating current, no load</b>		80 mA										
<b>Available memory area</b>												
within EEPROM 512		128 bytes										
within EEPROM 2048		1,792 bytes										
<b>Interface signals</b>												
Process data channel = SIN, REFSIN, COS, REFCOS		Analogue, differential										
Parameter channel = RS 485		Digital										

<sup>1)</sup> Condensation not permissible

<sup>2)</sup> To DIN EN 60068-2-27

<sup>3)</sup> To DIN EN 60068-2-6

<sup>4)</sup> With mating connector inserted

<sup>5)</sup> To DIN EN 61000-6-2 and DIN 61000-6-3

#### Ordering information

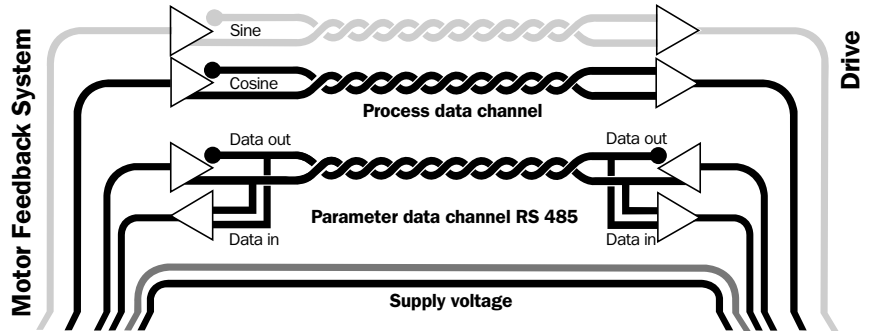
##### SRS/SRM 50 standalone; solid shaft Ø 6 mm; servo flange

Type	Part no.	Description
SRS50-HXA0-K01	1 034 197	Single, 512 EEprom, connector
SRS50-HXV0-K01	1 034 199	Single, 512 EEprom, cable 1,5 m
SRS50-HXA0-K02	1 034 198	Single, 2048 EEprom, connector
SRS50-HXV0-K02	1 034 200	Single, 2048 EEprom, cable 1,5 m
SRM50-HXA0-K01	1 034 136	Multi, 512 EEprom, connector
SRM50-HXV0-K01	1 034 138	Multi, 512 EEprom, cable 1,5 m
SRM50-HXA0-K02	1 034 137	Multi, 2048 EEprom, connector
SRM50-HXV0-K02	1 034 139	Multi, 2048 EEprom, cable 1,5 m



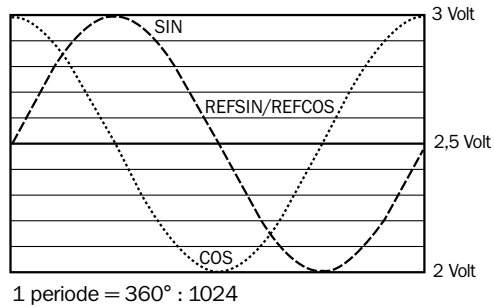
**Electrical interface**

- 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"



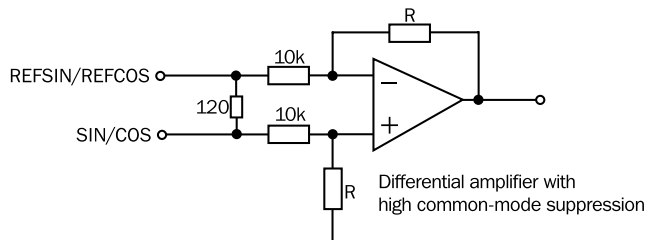
Access to the process data used for speed control, i.e. to the sine and cosine signals, is practically always "online". When the supply voltage is applied, the speed controller has access to this information at any time.

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

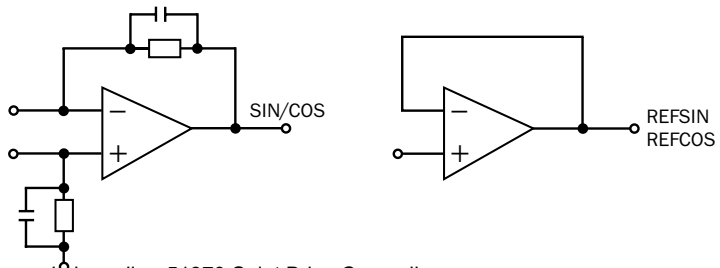
**Characteristics applicable to all permissible environmental conditions signal**

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 <sup>1)</sup>	Comments	Comments
42h	Read position			
43h	Set position	•		
44h	Read analogue value		Channel number 48h Temperature [°C]	Channel number 48h 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	•		

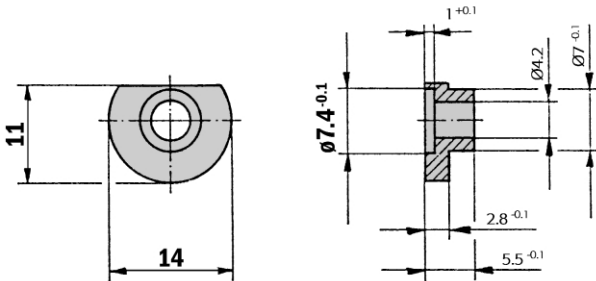
<sup>1)</sup> The commands thus labelled include the parameter "Code 0". Code 0 is a byte inserted into the protocol, for additional safeguarding of vital system parameters against accidental overwriting. When shipped, "Code 0" = 55h

Overview of status messages				
Error type	Status code	Description	SRS	SRM
	00h	The encoder has recognised no error	•	•
<b>Initialisation</b>	01h	Faulty compensating data	•	•
	02h	Faulty internal angular offset	•	•
	03h	Data field partitioning table damaged	•	•
	04h	Analogue limit values not available	•	•
	05h	Internal I <sup>2</sup> C bus not operational	•	•
	06h	Internal checksum error	•	•
<b>Protocol</b>	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	•	•
<b>Data</b>	0Eh	The selected data field must not be written to	•	•
	0Fh	Incorrect access code	•	•
	10h	Size of data field stated cannot be changed	•	•
	11h	Size of data field stated cannot be changed	•	•
	12h	Access to non-existent data field	•	•
	<b>Position</b>	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		•
<b>Other</b>	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

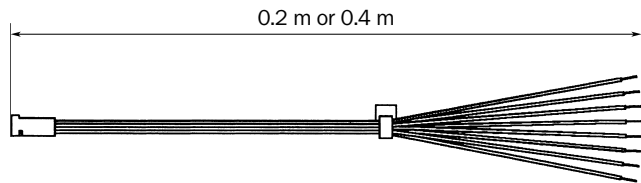
Type	Part no.
BEF-WK-SF	2 029 166



General tolerances to DIN ISO 2768-mk

Stranded cable/connector, straight, 8 wires, 8 x 0,24 mm<sup>2</sup>

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

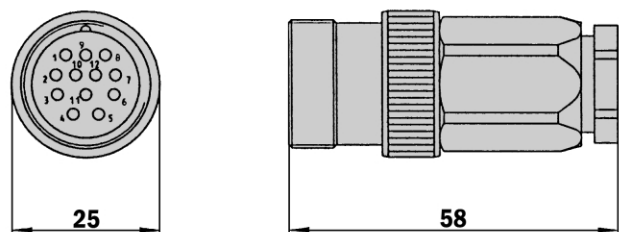
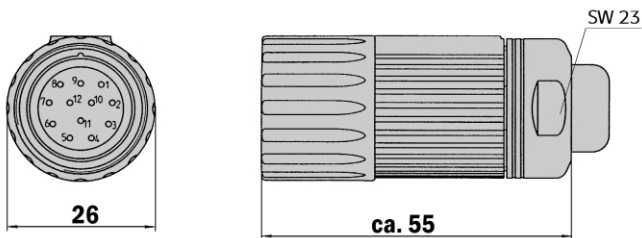


Connector M23 female, 12 pin, straight

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

Connector M23 male, 12 pin, straight, screened

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



**Dimensional drawings and ordering information**
**Cable connector M23, 12 pin, straight, cable 8 core, HIPERFACE<sup>®</sup>, screened**

Type	Part no.	Contacts	Cable length
DOL-2308-G1M5JB2	2 031 069	12	1.5 m
DOL-2308-G03M5JB2	2 031 070	12	3.0 m
DOL-2308-G05M5JB2	2 031 071	12	5.0 m
DOL-2308-G10M5JB2	2 031 072	12	10.0 m
DOL-2308-G15M5JB2	2 031 073	12	15.0 m

**HIPERFACE<sup>®</sup> cable, 8 wires, supplied by the metre 4 x 2 x 0,15 mm<sup>2</sup>**

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

**Programming tool for HIPERFACE<sup>®</sup> devices**

Type	Part no.	Motor Feedback System
PGT-03-S	1 034 252	SRS/SRM 50 standalone





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