



Operating Instructions



Servo Technology **CMS50/63/71 Electric Cylinder**





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1 General Information



1.1 How to use the operating instructions








Operating instructions are an integral part of the product and contain important information for operation and service. They are intended for staff responsible for the assembly, installation, startup and maintenance of the product.

The operating instructions must be legible and accessible at all times. Make sure that staff responsible for the plant and its operation, as well as persons who work independently on the unit, have read the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

The safety notes in these operating instructions are designed as follows:

Pictogram 	 SIGNAL WORD
	Type and source of danger. Possible consequence(s) if disregarded. <ul style="list-style-type: none"> • Measure(s) to prevent the danger.

Pictogram	Signal word	Meaning	Consequences if disregarded
Example:  General danger	 DANGER	Imminent danger	Severe or fatal injuries
 Specific danger, e.g. electric shock	 WARNING	Possible dangerous situation	Severe or fatal injuries
	 CAUTION	Possible dangerous situation	Minor injuries
	STOP	Possible damage to property	Damage to the drive system or its environment
	INFORMATION	Useful information or tip. Simplifies the handling of the drive system.	

**1.3 Rights to claim under limited warranty**

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the operating instructions. Therefore, read the operating instructions before you start working with the unit.

1.4 Exclusion of liability


You must comply with the information contained in these operating instructions to ensure safe operation of the electric motors and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.



2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must make sure that the basic safety notes are read and observed. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

2.1 General information

	<p>! DANGER</p>
	<p>Servomotors, gearmotors and gear units may have live, uninsulated (in case of open connector/terminal boxes), and sometimes moving or rotating parts as well as hot surfaces during operation.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observation of: <ul style="list-style-type: none"> – The relevant detailed operating instructions – Warning and safety signs on the motor/gearmotor – All other project planning documents, operating instructions and wiring diagrams belonging to the drive – The specific regulations and requirements for the system – National / regional regulations governing safety and the prevention of accidents • Never install damaged products • Immediately report any damages to the shipping company

Removing the required protection cover or the housing without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Refer to the documentation for additional information.



2.2 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of mechanical engineering (e.g. mechanic or mechatronic technician).
- They are familiar with these operating instructions.

Any electric work may only be performed by adequately qualified personnel. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of electrical engineering (e.g. electric or mechatronic technician).
- They are familiar with these operating instructions.

All persons involved in any other work, such as transportation, storage, operation and disposal, must be trained appropriately.

2.3 Designated use

The designated use refers to the procedure specified in the operating instructions.

CMS electric cylinders are drive motors designed for use in industrial and commercial systems. Motor loads other than those specified and areas of application other than industrial and commercial systems should only be used after consultation with SEW-EURODRIVE.

The CMS electric cylinders meet the requirements of the low voltage directive 2006/95/EC. Do not take the unit into operation until you have established that the end product complies with the EC Machinery Directive 98/37/EC.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.



2.4 Transportation/storage

Follow the instructions on transportation, storage and proper handling. Comply with the requirements for climatic conditions as stated in the order documents.

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. If you notice any transport damage, do not startup the motor, but contact the SEW-EURODRIVE Service.

Store the electric cylinder in a dry, dust-free environment if it is not to be installed straight away. The electric cylinder can be stored for one year without requiring any special measures before startup.

2.5 Mounting/installation

Adhere to the instructions in section "Mechanical Installation" (starting on page 29) and section "Electrical Installation" (starting on page 59).

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the electric cylinders from excessive strain. Ensure that components are not damaged, particularly during transportation and handling.

The following applications are prohibited unless the unit is explicitly designed for such use:

- Use in potentially explosive atmospheres,
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.



2.6 Electrical connection

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

Observe the wiring information and differing data on the nameplate.

Observe the instructions in section "Electrical Installation" (page 59).

2.7 Startup/operation

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, determine the cause and consult the manufacturer.

	<p>⚠ WARNING</p> <p>In hoist applications, note that the load torque of the application to be held in place must be less than the holding torque of the brake used.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • Observe the project planning guidelines. • The spindles that are used are not self-locking.
	<p>⚠ WARNING</p> <p>Series CMS electric cylinders may not execute any safety functions without master safety systems.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • Use master safety systems to ensure that equipment and personnel are protected.
	<p>⚠ WARNING</p> <p>Incorrect use, installation or operation represents a crushing hazard due to the vertical movement of the spindle.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • Take measures to prevent inadvertent contact.

Refer to the information in section "Startup", see page 97.



2.8 Inspection/maintenance

Refer to the instructions in section "Inspection and Maintenance", see page 101.

2.9 Disposal

This product consists of:

- Iron
- Aluminum
- copper
- Plastic
- Electronic components

Dispose of all components in accordance with applicable regulations.

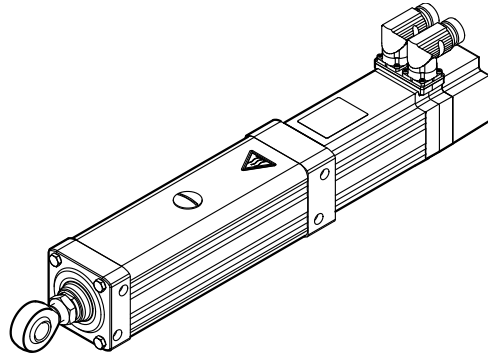


3 Electric Cylinder Design

3.1 Sizes

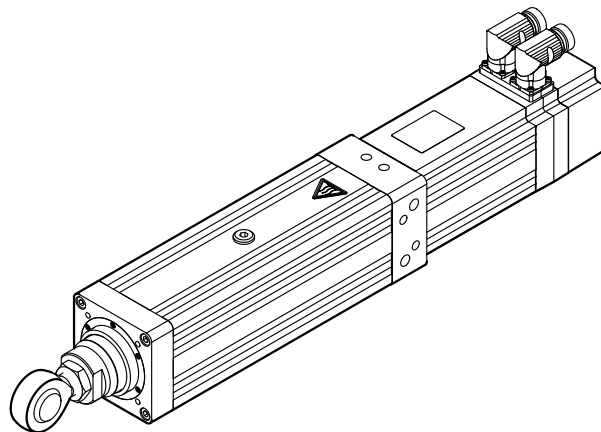
SEW-EURODRIVE offers **three product variants**:

3.1.1 CMS50S/M



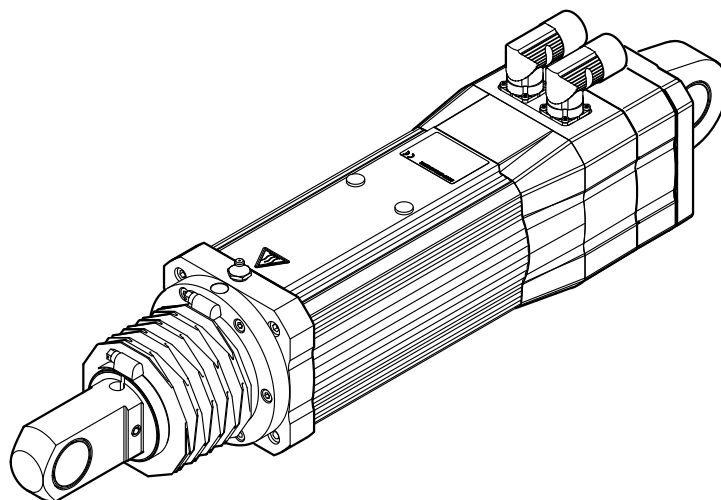
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3.1.2 CMS63S/M



64908AXX

3.1.3 CMS71L



64889AXX



3.2 **Functional description**

3.2.1 **General information**

Synchronous servomotors of the SEW CM/CMP motor series are used as the basis for the CMS electric cylinder series.

The service life of the electric cylinders (threaded spindle and bearings) must be taken into account, as it depends on the load cycle and travel cycle. The electric cylinders are equipped with a resolver that serves as a speed and position encoder. The absolute encoder (HIPERFACE® encoder) is available as an option. In connection with a servo controller, you can freely define acceleration, velocity, position and force profiles.

The repeat accuracy is 5/100 mm, if force and temperature are constant. The electric cylinders are available with or without brakes (holding brake only). The motor is available with plug connector only (no terminal box). The connector type CMP motor series is used (for resolver, HIPERFACE® encoder and power).

3.2.2 **CMS50S/M**

A CMP50S/M servomotor is used for the drive. An add-on component, comprising a screw drive and guide, is flanged onto the unit. All components and options of the motor, except the flanged endshield and the rotor (due to the larger bearing), are adopted from the CMP.

As standard, the drive is adapted to the customer's application through the flanged endshield on the A side of the motor. The rotor turns the threaded spindle while the nut remains fixed. The nut is routed in an aluminum extruded housing via T-slot nuts.

The nut and piston rod are connected to each other. The piston rod has a smooth, high-quality corrosion-proof surface and is sealed using a wiper with guide ring. The joint head is connected to the piston rod. The spindle nut has a lubricant reservoir, which extends the relubrication interval. The relubrication can also be carried out by a greasing nipple.

3.2.3 **CMS63S/M**

A CMP63S/M servomotor is used for the drive. An add-on component, comprising a screw drive and guide, is flanged onto the unit. All components and options of the motor, except the flanged endshield and the rotor (due to the larger bearing), are adopted from the CMP.

As standard, the drive is adapted to the customer's application through the flanged endshield on the A side of the motor. The rotor turns the threaded spindle while the nut remains fixed. The nut is routed in an aluminum extruded housing via T-slot nuts.

The nut and piston rod are connected to each other. The piston rod has a smooth, high-quality corrosion-proof surface and is sealed with a sealing system. The joint head is connected to the piston rod. An oil bath lubrication system supplies the bearing points, threaded spindle and seals with lubricant.



3.2.4 CMS71L

Synchronous servomotors of the SEW CM/CMP motor series are used as the basis for the CMS71L electric cylinder series.

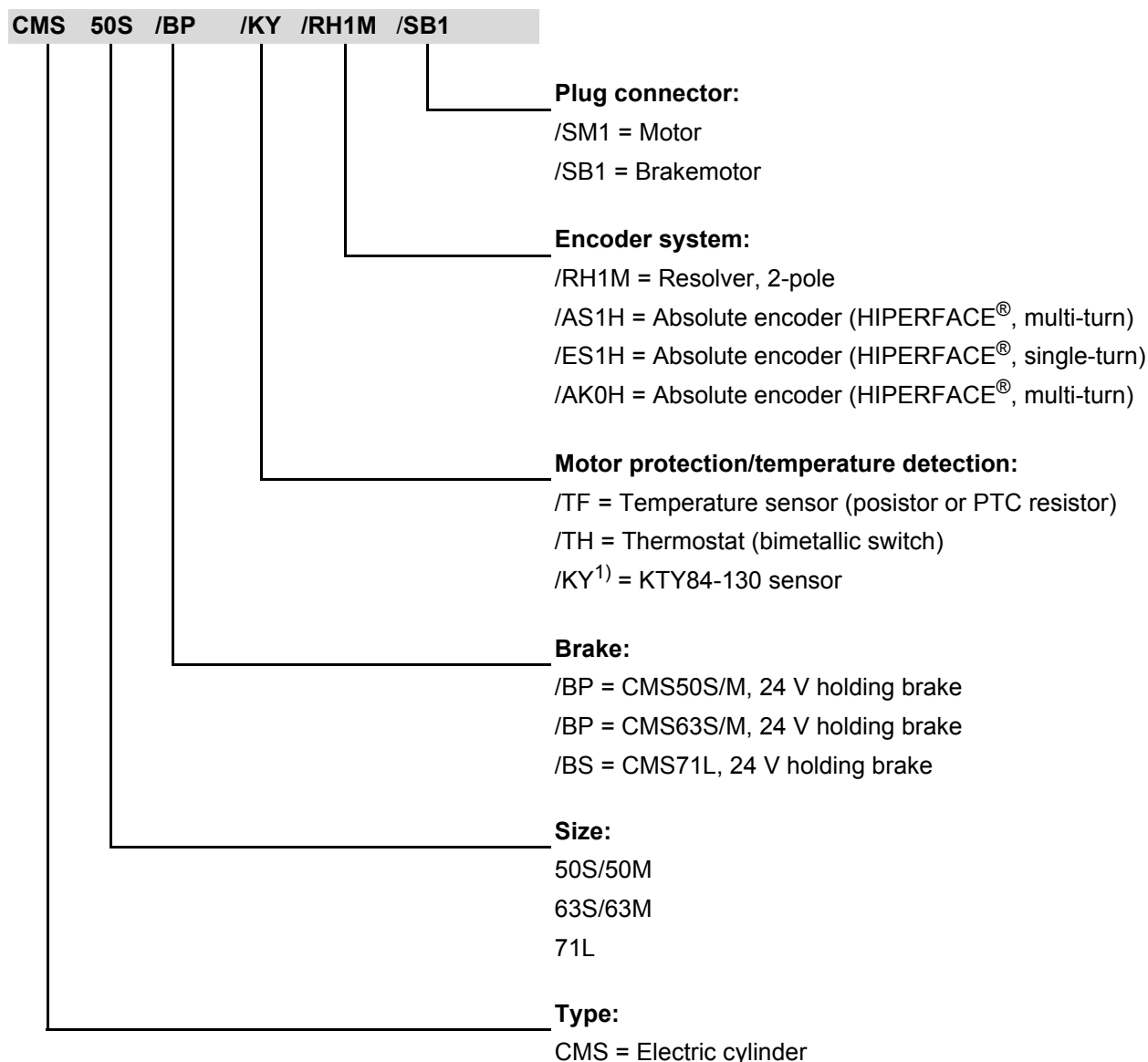
The rotors are designed as a hollow shaft. The spindle nut of the recirculating ball screw or planetary roller screw drive is attached to the rotor. Depending on the direction of the motor rotation, the threaded spindle is moved out of or in to the rotor. The threaded spindle must be prevented from turning, so that the rotary motion of the rotor (spindle nut) is transformed into a linear motion. The threaded spindle is protected from "heavy" contamination by a bellows.



3.3 Unit designation

The following characteristic unit data can be read from the unit designation of the electric cylinder:

Example: CMS50S electric cylinder



1) CMS50 and CMS63 are only available with KTY



3.4 Nameplate

Each electric cylinder has a nameplate that provides important information. The following figure shows an example of a nameplate.

Example

SEW-EURODRIVE		CE	
76646 Bruchsal/Germany			
CMS71L/BS/TF/AS1H/SB1			
01.12345678.01.0001.06			3~IEC60034
Motor M_0	9.5 Nm	I_0	6.2 A
Fpk	17 kN	I_{max}	25.0 A
U Sys	400 V	°C	-20...+40
nN	3000 r/min	ne pk	3000 r/min
Bremse	24 Vbr		19 Nm
Spindel	KGT	p	10 mm/r
		Hub	200 m
Fuchs RENOLIT CX-TOM15			
0594 927 0		Umrichterbetrieb	
Made in Germany			

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CMS type	Motor type
No.	Serial number
M_0	Standstill torque (thermal continuous torque at a speed of 5 to 200 rpm)
I_0	Standstill current
Fpk	Peak feed force
I_{max}	Maximum permitted motor current
IP	Degree of protection
U Sys	Motor voltage
°C	Ambient temperature range
iso. Kl.	Thermal class
nN	Rated speed
ne pk	Maximum mechanically permitted speed
kg	Weight
Bremse	Nominal voltage of brake/braking torque
Spindel	Spindle type
P	Spindle pitch
Hub	Stroke length
	Lubricant

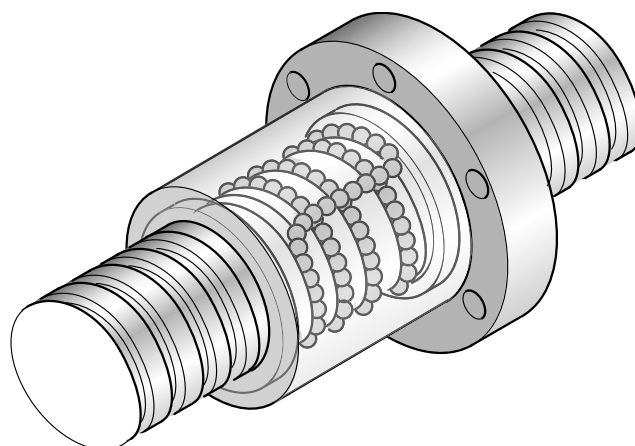


3.5 Operating principle – recirculating ball screw and planetary roller screw drive

We differentiate between the two following threaded spindle types for electric cylinders:

3.5.1 Recirculating ball screw (KGT)

The recirculating ball screw is used in the **CMS50S/M**, **CM63S/M** and **CMS71L** electric cylinders.



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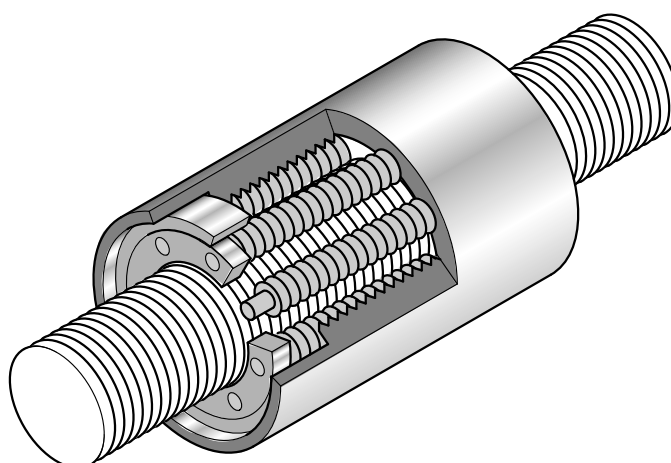
The recirculating ball screw transfers the load from the threaded spindle to the nut via ball bearings (power transmission by ball bearings).

3.5.2 Planetary roller screw drive (PGT)

The planetary roller screw drive is used in the **CM63S/M**, **CMS71L** electric cylinders.

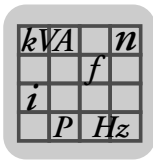
Preferred application areas:

- Low feed rate and high force
- Unfavorable operating conditions, such as die cutting



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The planetary roller screw drive transfers the load from the threaded spindle to the nut via the convex thread edges of rollers (power transmission by planetary rollers).



4 Technical Data

4.1 Key to the data tables

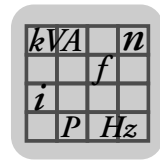
The following table lists the short symbols used in the "Technical Data" tables.

n_N	Rated speed
n_{epk}	Maximum mechanically permitted speed
M_0	Standstill torque (thermal continuous torque at low speeds)
I_0	Standstill current
M_{pk}	Maximum limit torque
I_{max}	Maximum current
J_{mot}	Mass moment of inertia without brake ¹⁾
J_{bmot}	Mass moment of inertia with brake ¹⁾
J_{zusatz}	Additional mass moment of inertia without brake ²⁾
$J_{bzusatz}$	Additional mass moment of inertia with brake ²⁾
M_B	Braking torque
L_1	Inductivity between connection phase and star point
R_1	Resistance between connection phase and star point
U_{p0kalt}	Internal voltage at 1000 rpm
P	Spindle pitch
D	Nominal spindle diameter
F	Maximum permanent feed force
F_{pk}	Peak feed force ³⁾
m	Weight, variant without brake
m_{bmot}	Weight, variant with brake

- 1) For the complete motor and spindle
- 2) For project planning with the SEW Workbench
- 3) Depending on max. amplifier current, dynamic or static load of spindle; prior to project planning with maximum force please contact SEW-EURODRIVE.

4.2 General features

Variant	
Thermal class	F (155 °C)
Ambient temperature	-20 °C to +40 °C
Noise levels / EN 60034	Below specified value
Vibration class	"B" to EN 60034-14
Positioning accuracy (repetition accuracy) at constant force and temperature	±0.05 mm



4.3 CMS50

4.3.1 Features

Variant	Default	Optional
Degree of protection	IP65	
Motor protection	KTY	
Mounting position	Any	
Cooling	Natural convection	VR forced cooling fan
Lubrication	Via housing bore, with taper greasing nipple DIN 71412-A	
Spindle protection	Smooth piston rod with sealing system	

4.3.2 Technical data

	STOP
	Stroke length 300 mm → $n_{epk} = 2500 \text{ min}^{-1}$ (max. mechanical speed)
	Stroke lengths 70 and 150 mm → $n_{epk} = 4500 \text{ min}^{-1}$ (max. mechanical speed)

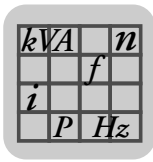
CMS50S

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz}	$J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	$[\text{min}^{-1}]$	$[\text{mm}]$	$[\text{Nm}]$	$[\text{A}]$	$[\text{Nm}]$	$[\text{A}]$	$[\text{kgcm}^2]$				$[\text{Nm}]$	$[\text{mH}]$	$[\Omega]$	$[\text{V}]$	$[\text{kN}]$	$[\text{kg}]$		
KGT 15x5	3000	70	1.3	0.96	5.2	5.1	0.54	0.6	0.12	0.12	4.3	71	22.49	86	1.2	5.3	5.8	6.4
		150					0.56	0.62	0.14	0.14							6.5	7.1
		300					0.61	0.67	0.19	0.19							7.8	8.4
	4500	70	1.3	1.32	5.2	7.0	0.54	0.6	0.12	0.12	4.3	37	11.61	62	1.2	5.3	5.8	6.4
		150					0.56	0.62	0.14	0.14							6.5	7.1
		300					0.61	0.67	0.19	0.19							7.8	8.4
	6000	70	1.3	1.7	5.2	9.0	0.54	0.6	0.12	0.12	4.3	22.5	7.11	48.5	1.2	5.3	5.8	6.4
		150					0.56	0.62	0.14	0.14							6.5	7.1
		300					0.61	0.67	0.19	0.19							7.8	8.4

CMS50M

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz}	$J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	$[\text{min}^{-1}]$	$[\text{mm}]$	$[\text{Nm}]$	$[\text{A}]$	$[\text{Nm}]$	$[\text{A}]$	$[\text{kgcm}^2]$				$[\text{Nm}]$	$[\text{mH}]$	$[\Omega]$	$[\text{V}]$	$[\text{kN}]$	$[\text{kg}]$		
KGT 15x5	3000	70	2.4	1.68	5.2^1	4.0^3	0.79	0.85	0.12	0.12	4.3	38.5	9.96	90	2.2	5.3	6.8	7.4
		150			$(10.3)^2$	$(9.6)^2$	0.81	0.87	0.14	0.14							7.5	8.1
		300			0.86	0.92	0.19	0.19	8.8	9.4								
	4500	70	2.4	2.3	5.2^1	5.4^3	0.79	0.85	0.12	0.12	4.3	20.5	5.28	66	2.2	5.3	6.8	7.4
		150			$(10.3)^2$	$(13.1)^2$	0.81	0.87	0.14	0.14							7.5	8.1
		300			0.86	0.92	0.19	0.19	8.8	9.4								
	6000	70	2.4	3.0	5.2^1	7.0^3	0.79	0.85	0.12	0.12	4.3	12.0	3.21	50.5	2.2	5.3	6.8	7.4
		150			$(10.3)^2$	$(17.1)^2$	0.81	0.87	0.14	0.14							7.5	8.1
		300			0.86	0.92	0.19	0.19	8.8	9.4								

- 1) Maximum permitted torque
- 2) Standard values of motor
- 3) Maximum permitted current




4.4 CMS63

4.4.1 Features

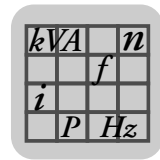
Variant	Default	Optional
Degree of protection	IP65	
Motor protection	KTY	
Mounting position	See chapter 4.21.2	
Cooling	Natural convection/water cooling	VR forced cooling fan
Lubrication	Oil bath lubrication	
Spindle protection	Smooth piston rod with sealing system	

4.4.2 Technical data

	STOP
	Stroke lengths 100, 200, 400 and 600 mm → $n_{epk} = 4500 \text{ min}^{-1}$ (max. mechanical speed)

CMS63S

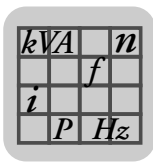
Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz}	$J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[min^{-1}]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]				[Nm]	[mH]	[Ω]	[V]	[kN]	[kg]		
KGT 25x6	3000	100	2.9	2.15	11.1	12.9	1.92	2.26	0.77	0.77	9.3	36.5	6.79	90	2.4	10	9.5	10.5
		200					2.24	2.58	1.09	1.09							11	12
		400					2.64	2.98	1.49	1.49							15	16
		600					3.1	3.44	1.95	1.95							18	19
	4500	100	2.9	3.05	11.1	18.3	1.92	2.26	0.77	0.77	9.3	18.3	3.34	64	2.4	10	9.5	10.5
		200					2.24	2.58	1.09	1.09							11	12
		400					2.64	2.98	1.49	1.49							15	16
		600					3.1	3.44	1.95	1.95							18	19
	6000	100	2.9	3.9	11.1	23.4	1.92	2.26	0.77	0.77	9.3	11.2	2.1	50	2.4	10	9.5	10.5
		200					2.24	2.58	1.09	1.09							11	12
		400					2.64	2.98	1.49	1.49							15	16
		600					3.1	3.44	1.95	1.95							18	19
PGT 20x5	3000	100	2.9	2.15	11.1	12.9	1.69	2.03	0.54	0.54	9.3	36.5	6.79	90	2.8	10	9.5	10.5
		200					1.81	2.15	0.66	0.66							11	12
	4500	100	2.9	3.05	11.1	18.3	1.69	2.03	0.54	0.54	9.3	18.3	3.34	64	2.8	10	9.5	10.5
		200					1.81	2.15	0.66	0.66							11	12
	6000	100	2.9	3.9	11.1	23.4	1.69	2.03	0.54	0.54	9.3	11.2	2.1	50	2.8	10	9.5	10.5
		200					1.81	2.15	0.66	0.66							11	12



CMS63M

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz}	$J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[min ⁻¹]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm ²]				[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 25x6	3000	100	5.3	3.6	11.1 ¹⁾ (21.4) ²⁾	7.9 ³⁾ (21.6) ²⁾	2.69	3.03	0.77	0.77	9.3	22	3.56	100	4.1	10	11	12
		3.01					3.35	1.09	1.09	12.5							13.5	
		3.41					3.75	1.49	1.49	16.5							17.5	
		3.87					4.21	1.95	1.95	19.5							20.5	
	4500	100	5.3	5.4	11.1 ¹⁾ (21.4) ²⁾	11.9 ³⁾ (32.4) ²⁾	2.69	3.03	0.77	0.77	9.3	9.8	1.48	67	4.1	10	11	12
		3.01					3.35	1.09	1.09	12.5							13.5	
		3.41					3.75	1.49	1.49	16.5							17.5	
		3.87					4.21	1.95	1.95	19.5							20.5	
	6000	100	5.3	6.9	11.1 ¹⁾ (21.4) ²⁾	15.2 ³⁾ (41.4) ²⁾	2.69	3.03	0.77	0.77	9.3	5.9	0.92	52	4.1	10	11	12
		3.01					3.35	1.09	1.09	12.5							13.5	
		3.41					3.75	1.49	1.49	16.5							17.5	
		3.87					4.21	1.95	1.95	19.5							20.5	
PGT 20x5	3000	100	5.3	3.6	11.1 ¹⁾ (21.4) ²⁾	7.9 ³⁾ (21.6) ²⁾	2.46	2.8	0.54	0.54	9.3	22	3.56	100	5.2	10	11	12
		2.58					2.92	0.66	0.66	12.5							13.5	
	4500	100	5.3	5.4	11.1 ¹⁾ (21.4) ²⁾	11.9 ³⁾ (32.4) ²⁾	2.46	2.8	0.54	0.54	9.3	9.8	1.48	67	5.2	10	11	12
		2.58					2.92	0.66	0.66	12.5							13.5	
	6000	100	5.3	6.9	11.1 ¹⁾ (21.4) ²⁾	15.2 ³⁾ (41.4) ²⁾	2.46	2.8	0.54	0.54	9.3	5.9	0.92	52	5.2	10	11	12
		2.58					2.92	0.66	0.66	12.5							13.5	

- 1) Max. permitted torque
- 2) Standard values of motor
- 3) Max. permitted current




4.5 CMS71

4.5.1 Features

Variant	Default	Optional
Degree of protection	IP45 (IP65) ¹⁾	
Motor protection	TF	KTY/TH
Mounting position	Any	
Cooling	Natural convection	
Lubrication	Fixed lubrication point with taper greasing nipple DIN 71412-A	Lubricator chapter 9.5
Spindle protection	Bellows	

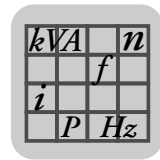
1) For electrical components

4.5.2 Technical data

	STOP
	Stroke length 200 mm → $n_{epk} = 3000 \text{ min}^{-1}$ (max. mechanical speed)
	Stroke length 350 mm → $n_{epk} = 2000 \text{ min}^{-1}$ (max. mechanical speed)

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz}	$J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[min^{-1}]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]				[Nm]	[mH]	[Ω]	[V]	[kN]	[kg]		
KGT 32x6	2000	200	9.5	4.2	$22.1^{1)}$ (31.4) ²⁾	$9.2^{3)}$ (16.8) ²⁾	32.5	37.5	23.3	26.6	19	24	2.5	151	6.7	20	19	20
		350	9.5	4.2	$16.6^{1)}$ (31.4) ²⁾	$7.3^{3)}$ (16.8) ²⁾	45.3	50.3	36.1	39.4	19	24	2.5	151	6.7	15 ⁴⁾	25	26
	3000	200	9.5	6.2	$22.1^{1)}$ (31.4)	$13.6^{3)}$ (25) ²⁾	32.5	37.5	23.3	26.6	19	11	1.12	102	6.7	20	19	20
		350	9.5	6.2	$16.6^{1)}$ (31.4) ²⁾	$10.8^{3)}$ (25) ²⁾	45.3	50.3	36.1	39.4	19	11	1.12	102	6.7	15 ⁴⁾	25	26
	4500	200	9.5	9.6	$22.1^{1)}$ (31.4) ²⁾	$21.1^{3)}$ (38) ²⁾	32.5	37.5	23.3	26.6	19	4.5	0.5	65	6.7	20	19	20
		350	9.5	9.6	$16.6^{1)}$ (31.4) ²⁾	$16.8^{3)}$ (38) ²⁾	45.3	50.3	36.1	39.4	19	4.5	0.5	65	6.7	15 ⁴⁾	25	26
KGT 32x10	2000	200	9.5	4.2	31.4	16.8	32.5	37.5	23.3	26.6	19	24	2.5	151	3.6	17	19	20
	3000	200	9.5	6.2	31.4	25	32.5	37.5	23.3	26.6	19	11	1.12	102	3.6	17	19	20
	4500	200	9.5	9.6	31.4	38	32.5	37.5	23.3	26.6	19	4.5	0.5	65	3.6	17	19	20
PGT 24x5	2000	200	9.5	4.2	$24.4^{1)}$ (31.4) ²⁾	$10.5^{3)}$ (16.8) ²⁾	32.5	37.5	23.3	26.6	19	24	2.5	151	7.2	20	19	20
	3000	200	9.5	6.2	$24.4^{1)}$ (31.4) ²⁾	$15.5^{3)}$ (25) ²⁾	32.5	37.5	23.3	26.6	19	11	1.12	102	7.2	20	19	20
	4500	200	9.5	9.6	$24.4^{1)}$ (31.4) ²⁾	$24^{3)}$ (38) ²⁾	32.5	37.5	23.3	26.6	19	4.5	0.5	65	7.2	20	19	20

- 1) Max. permitted torque
- 2) Standard values of motor
- 3) Max. permitted current
- 4) In case of tensile loads, a peak feed force F_{pk} of 20 kN is possible



4.6 Brake

The standard voltage supply of the brakes is 24 V DC and they operate with a constant braking torque. The brakes cannot be retrofitted and operate without brake rectifier or brake control unit. Observe the maximum currents of the brakes when connecting them (see next page). The overvoltage protection must be implemented by the customer, for example using varistors.

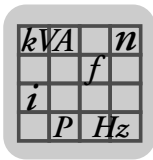
The brake can be used at all speeds.

The brake is released electrically. The brake is applied when the voltage is switched off.

	<p>STOP</p> <p>The BS brake of CMS71L will not function if the polarity is incorrect. Make sure the polarity is correct.</p>
	<p>STOP</p> <p>Comply with the applicable regulations issued by the relevant employer's liability insurance association regarding phase failure protection and the associated circuit/circuit modification!</p>
	<p>INFORMATION</p> <p>In view of the DC voltage to be switched and the high level of current load, it is essential to use either special brake contactors or AC contactors with contacts in utilization category AC-3 to EN 60947-4-1.</p>

The mechanical brake is not used as service brake but as emergency brake or holding brake for general machine standstill.

Observe the notes in the relevant operating instructions for servo controllers concerning the switching sequence of motor enable and brake control during standard operation.



4.6.1 BP/BS brakes

The following table lists the technical data of the brakes.

Motor type	Brake type	V_N [V _{DC}]	R [Ω]	I [A]	P [W]	M_B [Nm]	t_1 [10 ⁻³ s]	t_2 [10 ⁻³ s]
CMS50S	BP04	24	56.5	0.42	10.2	4.3	60	15
CMS50M								
CMS63S	BP09		35	0.67	16	9.3	60	15
CMS63M								
CMS71L	BS2		34	0.71	17	19	120	120

M_B = Braking torque

P = Power consumption of the coil

t_1 = Response time

t_2 = Application time

I = Operating current 20 °C

R = Coil resistance

V_N = Nominal voltage



INFORMATION

Customer installations are not taken into account for the response and application times of the brakes in the above tables.

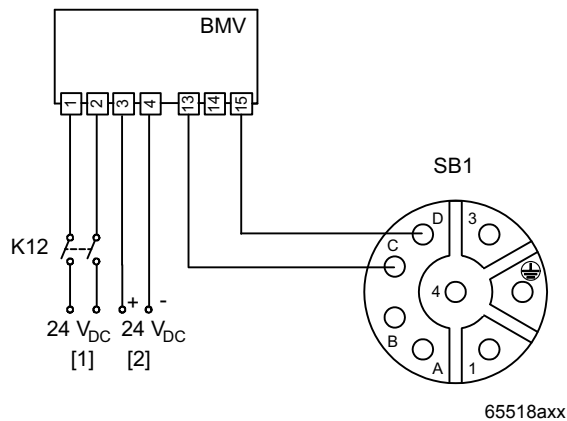
4.6.2 BMV brake control system

The brakes for the CMS electric cylinders can be controlled via the BMV brake relay as an option.

In every application, the BS/BP holding brake can be controlled via the BMV brake relay or a customer relay with varistor overvoltage protection.

If the system complies with the specifications for direct brake control, a BS/BP brake can also be controlled directly via the brake output of a MOVIAXIS[®] servo inverter.

Brake control system BMV

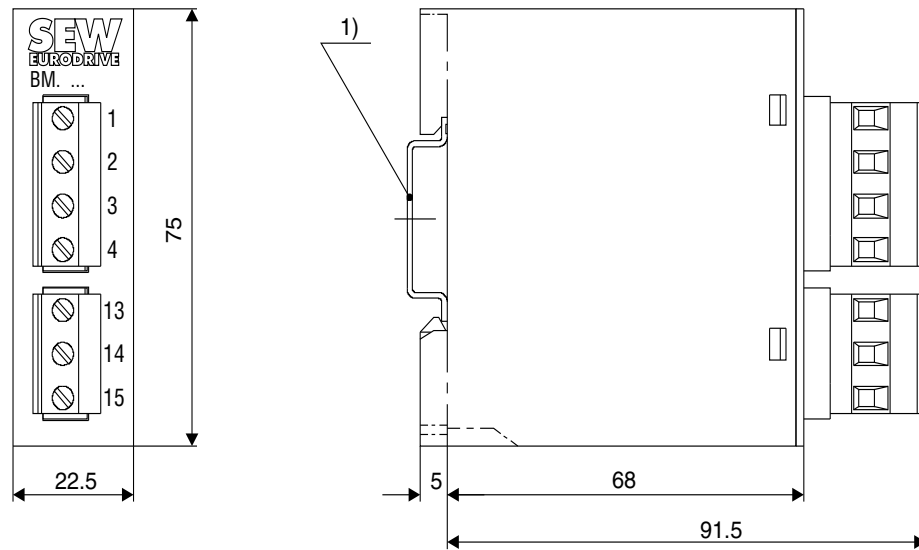


[1] External 24 V voltage supply for the brake

[2] Servo inverter brake output

kVA	n
f	
i	
P	Hz

Dimension drawing

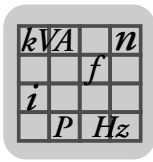


01645BXX

[1] Support rail mounting EN 50022-35-7.5

The mechanical brake is not used as service brake but as emergency brake or holding brake for general machine standstill.

Observe the notes in the relevant operating instructions for servo controllers concerning the switching sequence of motor enable and brake control during standard operation.



4.7 Encoder systems

The following encoder systems are used for the CMS50S, CMS63S/M and CMS71L electric cylinders.

4.7.1 Resolver

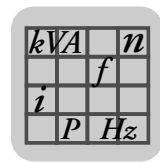
Part number for RH1M	0199 031 4
Number of poles	2
Primary	Rotor
Input voltage	7 V
Input frequency	7 kHz
Gear ratio $\pm 10\%$	0.5
Phase shift $\pm 5^\circ$	+13°
Input impedance $\pm 15\%$	130 + j120 Ω
Output impedance $\pm 15\%$	200 + j270 Ω
Input resistance $\pm 10\%$	82 Ω
Output resistance $\pm 10\%$	68 Ω
Max. electrical fault	$\pm 6'$
Temperature range	-55 °C to +150 °C

4.7.2 HIPERFACE® encoder

/ES1H, /AS1H, /AKOH

SEW-EURODRIVE offers HIPERFACE® encoders as an alternative to the resolver.

Type	ES1H	AS1H	AK0H
CMS50M/S and CMS63S/M	1335 496 5	1335 495 7	0199 583 9
CMS71L	1332 860 3	1332 858 1	
Supply voltage	DC 7 - 8 - 12 V polarity reversal protected		
Max. current consumption	140 mA		120 mA
Cut-off frequency	200 kHz		26 kHz
Pulses (sine cycles) per revolution	1024		128
Output amplitude per track	0.9 - 1.1 V_{SS} sin/cos		0.8 - 1.1 V_{SS} sin/cos
Single-turn resolution	32768 increments/revolution (15 bit)		4096 increments/revolution (15 bit)
Multi-turn resolution	-	4096 revolutions (12 bits)	
Transmission protocol	HIPERFACE®		
Serial data output	Driver to EIA RS-485		
Vibration resistance (10-2000 Hz)	$\leq 200 \text{ m/s}^2$ (DIN IEC 68-2-6)		$\leq 100 \text{ m/s}^2$ (DIN IEC 68-2-6)
Maximum speed	12000 min^{-1}		9000 min^{-1}
Connection	12-pin round connector		
Temperature range	-20 °C to +110 °C		



4.8 Switching equipment and safeguards of the motor series

4.8.1 Protective measures

The electric cylinders must be protected against both overloads and short circuits.

Install the motors with sufficient space for air to cool them.

The surface temperature may be in excess of 100 °C during operation in accordance with thermal classification F. Therefore, measures must be taken to prevent inadvertent contact.

The motors are equipped with temperature detection to protect the motor winding against overheating.

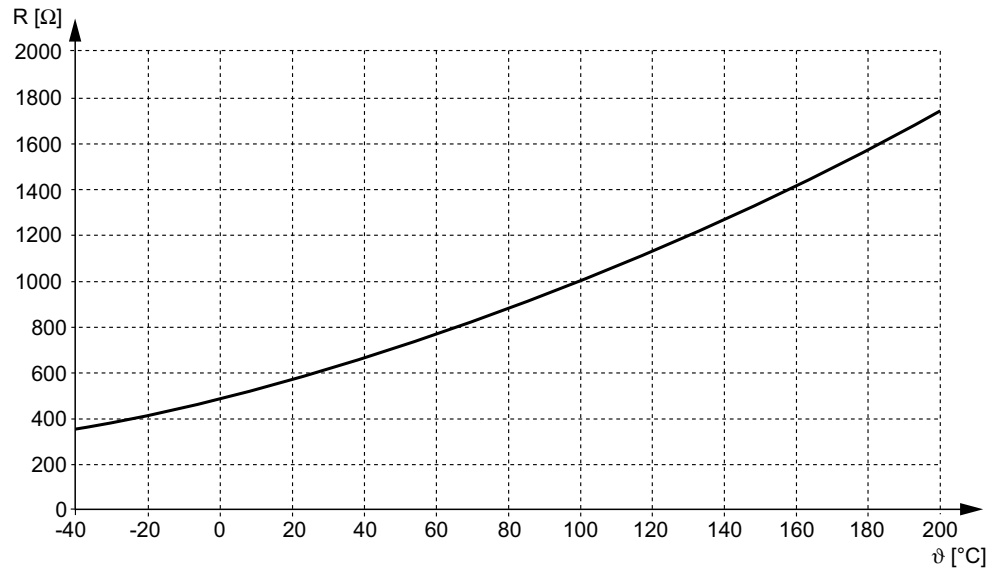
Temperature sensor KTY CMS50/63/71

The temperature is measured using the KTY 84-130 temperature sensors, which are installed as standard. The correct model must be activated in the servo inverter to enable thermal motor protection (I^2t , effective current monitoring). For information on the procedure, refer to the documentation of the servo inverter.

Observe the following points:

- It is essential to observe the correct connection of the KTY to ensure correct evaluation of the temperature sensor.
- Avoid currents > 4 mA in the circuit of the KTY since high self-heating of the temperature sensor can damage its insulation and the motor winding.

The characteristic curve in the following figure shows the resistance curve with a measuring current of 2 mA.

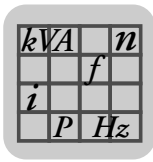


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STOP

Thermal protection is not active if the polarity is incorrect. Make sure the polarity is correct.



Technical Data

Switching equipment and safeguards of the motor series

TF temperature sensor (optional CMS71L)

The PTC thermistors comply with DIN 44082.

Resistance measurement (measuring instrument with $V \leq 2.5 \text{ V}$ or $I < 1 \text{ mA}$):

- Standard measured values: 20...500 Ω , thermal resistance $> 4000 \text{ } \Omega$

TF bimetallic switch (optional CMS71L)

The thermostats are connected in series and open when the permitted winding temperature is exceeded.

TH data	AC	DC	
Max. voltage	AC 60 V ¹⁾	DC 60 V	DC 24 V
Current ($\cos \varphi = 1.0$)	AC 2.5 A	DC 1.0 A	DC 1.6 A
Current ($\cos \varphi = 0,6$)	AC 1.6 A		

1) AC 250 V is permitted in the variant with terminal box

4.8.2 EMC measures

SEW-EURODRIVE synchronous servomotors are components for installation in machinery and systems. The designer of the machine or system is responsible for complying with the EMC Directive 89/336/EEC.

Routing brake cables

The brake and power cables may only be routed together if either the brake cable or the power cable is shielded. We recommend that you use prefabricated cables, see page 68.

Notes on the encoder connection

Observe the following instructions when connecting an encoder:

- Use a shielded cable with twisted pair conductors only.
- Connect the shield to the PE potential on both ends over a large surface area.

Thermal motor protection

The cables can only be routed together if either the KTY cable or the power cable is shielded. We recommend that you use prefabricated cables, see page 68.



5 Mechanical Installation

5.1 Required tools / resources

- Standard tools
- For plug connectors assembled by the customer:
 - Crimping pliers up to 10 mm² cable cross section
 - Crimping pliers from 16 mm² cable cross section
- For delivery until 12/2008: Removal tool for insulator when changing the plug connector.
- For delivery as of 01/2009: No tool required for right-angle plug connector.



5.2 Before you start



Install the drive only if the following conditions are met:

- The drive must be undamaged (no damage caused by shipping or storage).
- The specifications on the nameplate of the drive correspond to the supply system or the output voltage of the servo inverter.
- The ambient temperature is between -20 °C and +40 °C.
- The installation altitude must be no higher than 1000 m above MSL, otherwise the drive must be designed to meet the special environmental conditions.
- The surrounding area is free from oils, acids, gases, vapors, radiation, etc.



5.3 Installing the electric cylinder

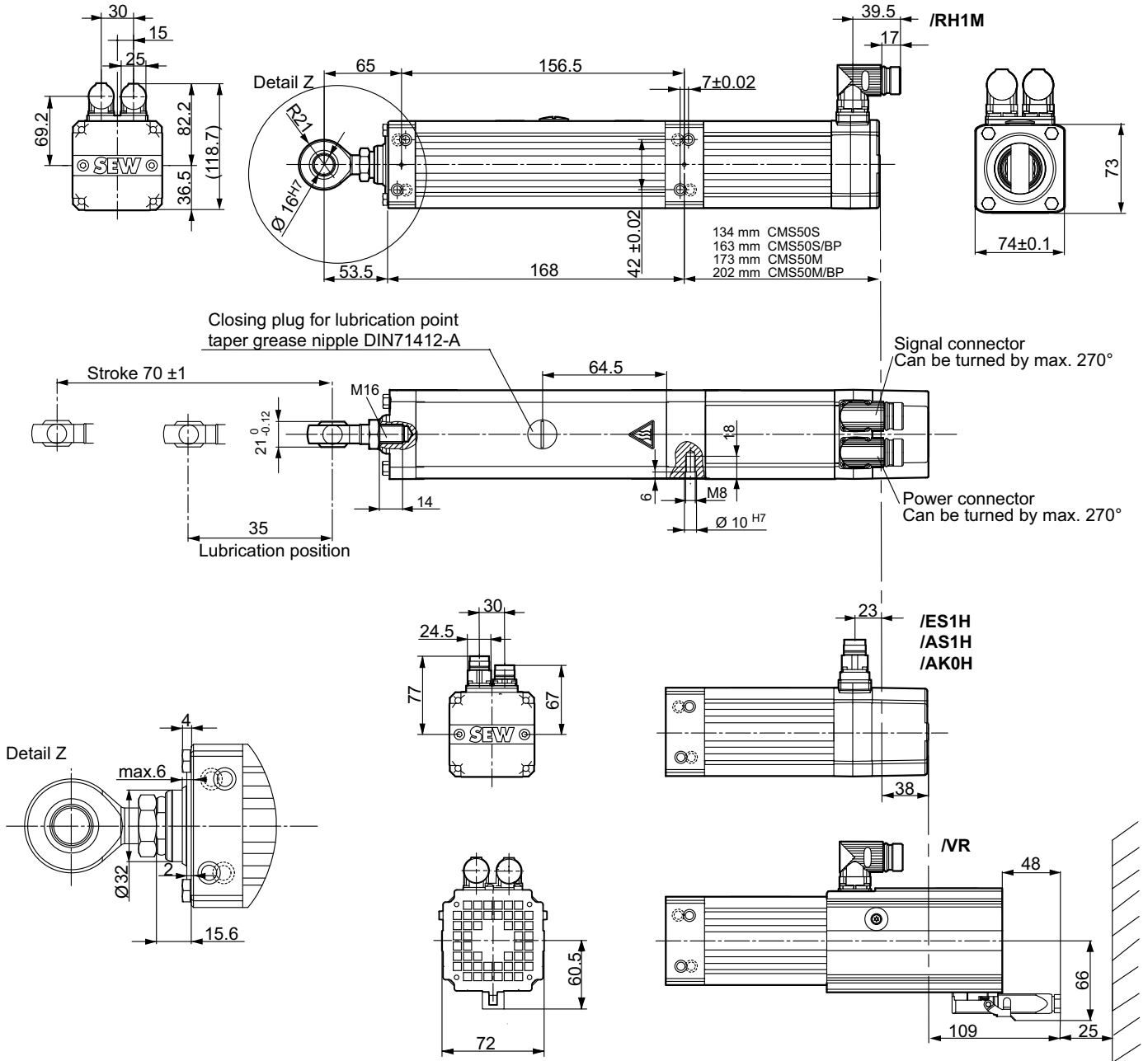
	 CAUTION
	<p>Improper mounting may result in damages to the electric cylinder.</p> <p>Possible damage to property</p> <ul style="list-style-type: none"> • Mount the electric cylinder only on a level, vibration-free and torsionally rigid support structure. • Make sure the customer's counter-bearing is unobstructed and can move freely. • Carefully align the electric cylinder and the driven machine to avoid placing any unacceptable strain on the spindle (observe permissible axial load data). Observe the notes in section 5. • No overhung loads and bending moments acting on the electric cylinder. • Do not jolt or hammer the spindle end. • Protect the bellows and threaded spindle against mechanical damage.

	 WARNING
	<p>The electric cylinder can have a surface temperature of more than 65 °C during operation.</p> <p>Danger of burns.</p> <ul style="list-style-type: none"> • Never touch the electric cylinder during operation or in the cool down phase once the it has been switched off.

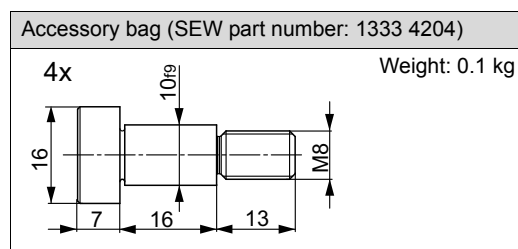


5.4 CMS50S/M mounting dimensions

5.4.1 Mounting dimensions for a stroke length of 70 mm



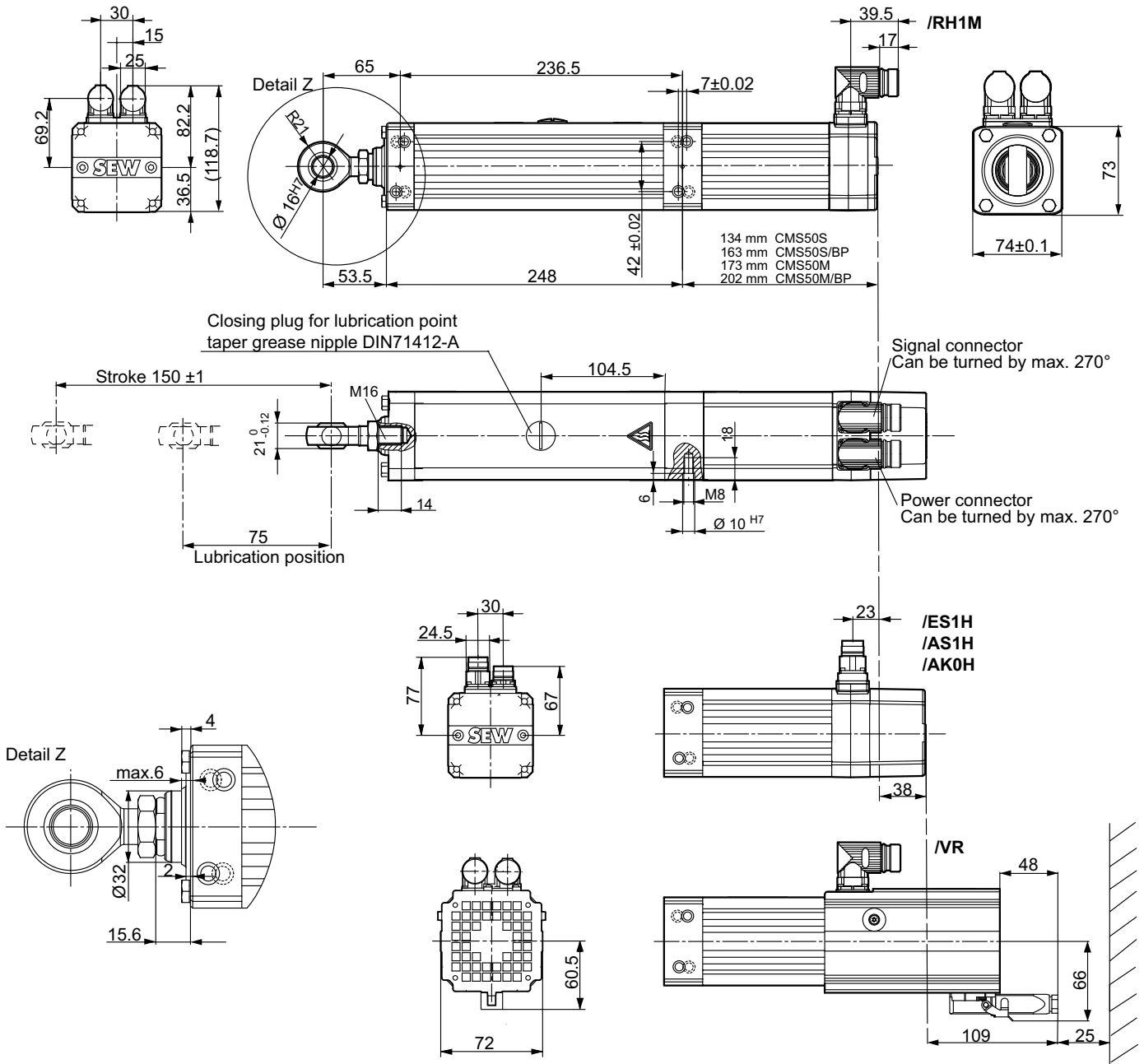
Each CMS50 comes with an accessory bag (with 4 fit bolts) for flange or pivot bearing mounting.





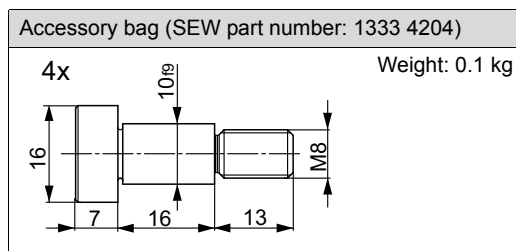
Mechanical Installation
CMS50S/M mounting dimensions

5.4.2 Mounting dimensions for a stroke length of 150 mm



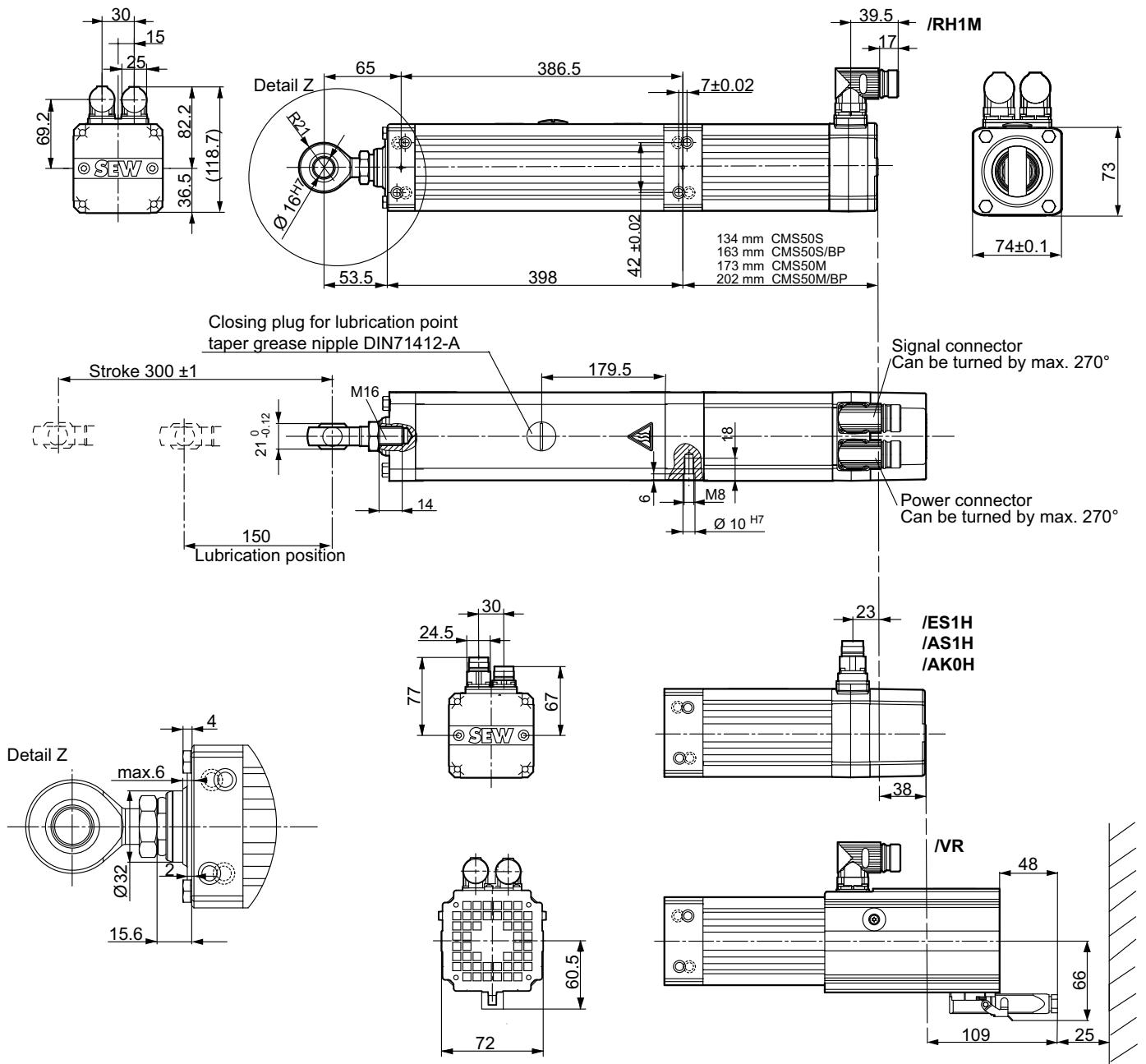
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Each CMS50 comes with an accessory bag (with 4 fit bolts) for flange or pivot bearing mounting.

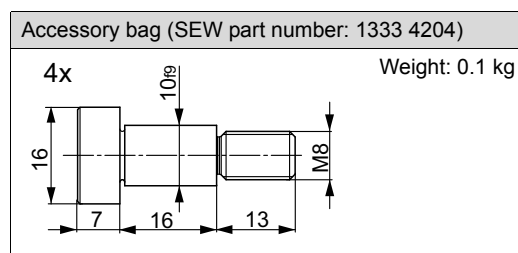




5.4.3 Mounting dimensions for a stroke length of 300 mm



Each CMS50 comes with an accessory bag (with 4 fit bolts) for flange or pivot bearing mounting.

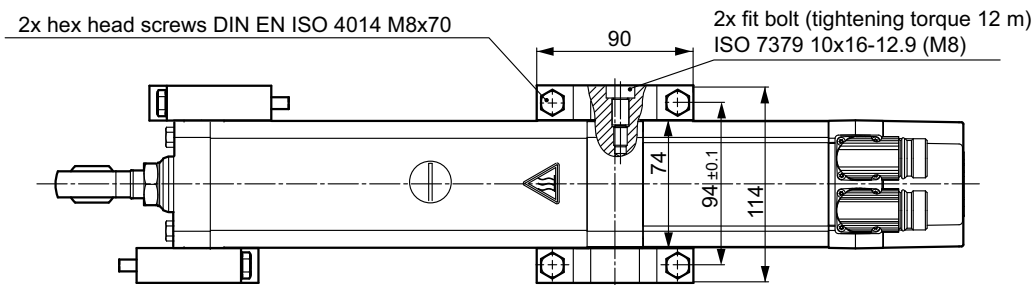
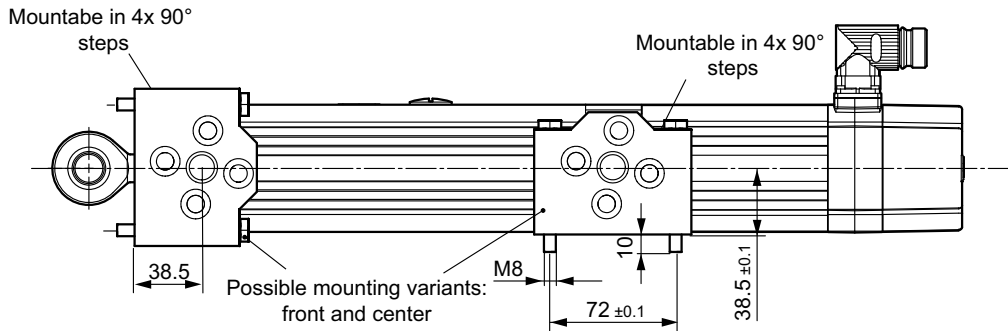
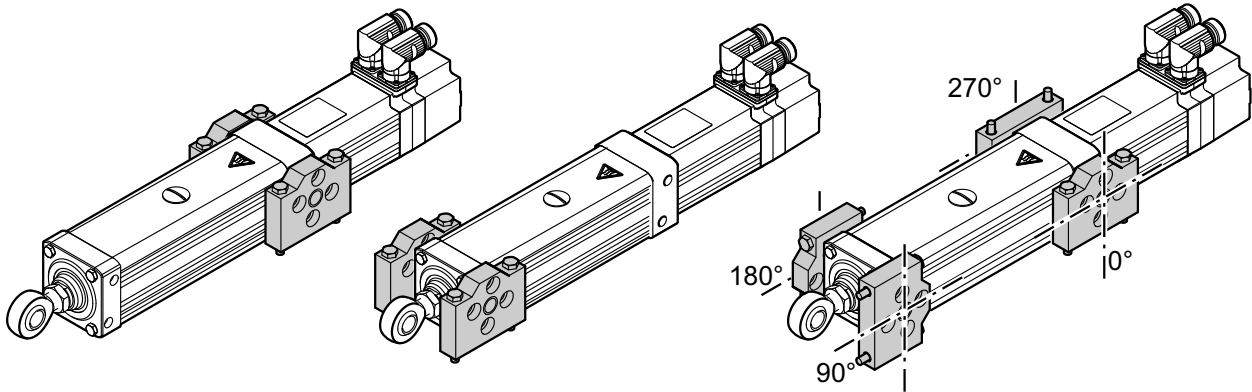




5.4.4 Additional mounting options

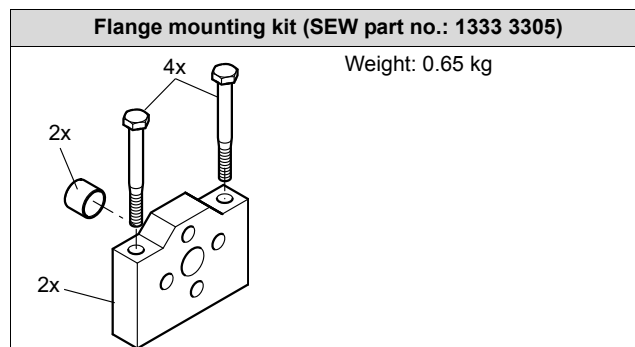
Flange mounting

The following 3 figures show the mounting options for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components. The mount-on components can be mounted in 90° steps.



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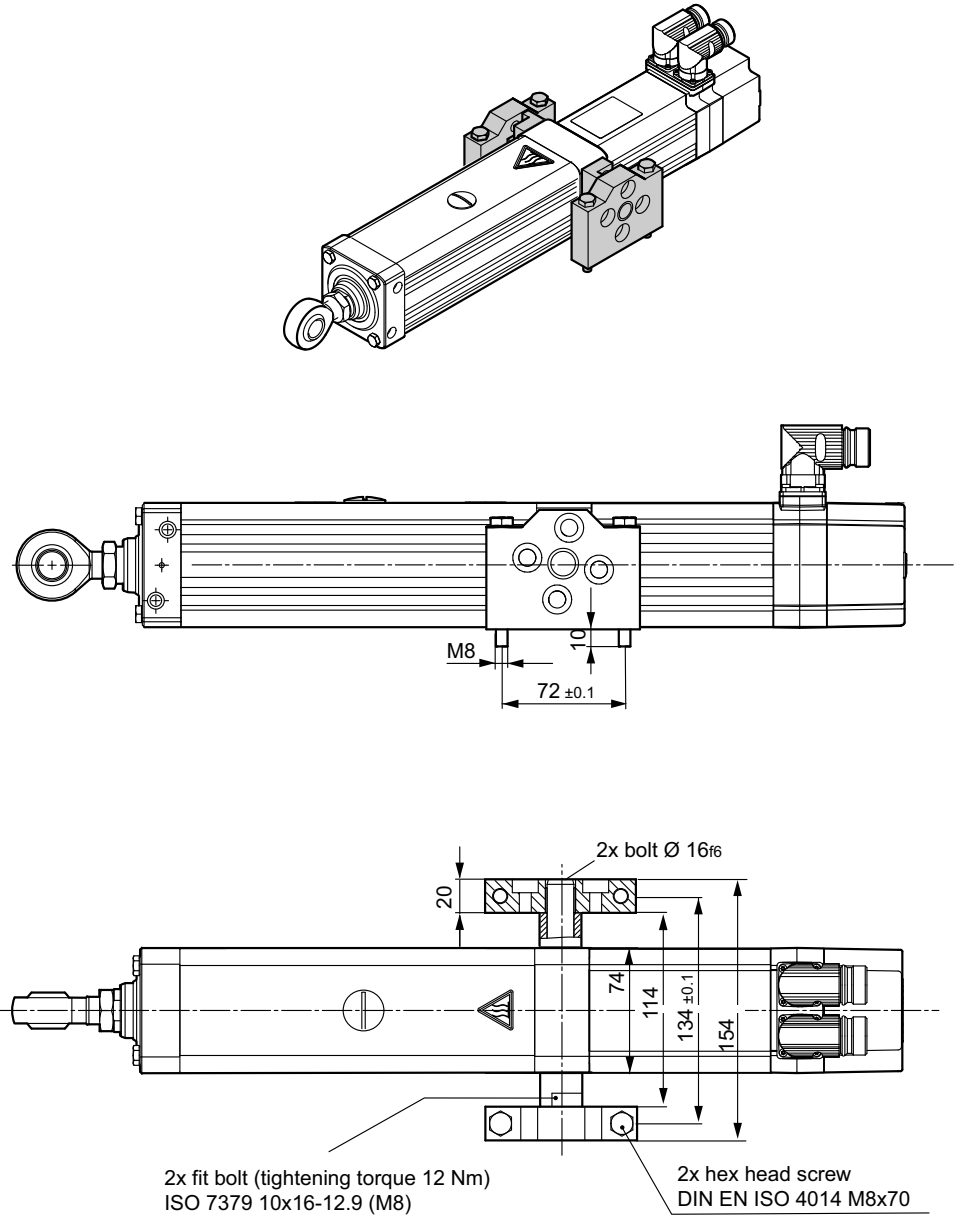
The flange mounting kit consists of the following parts:





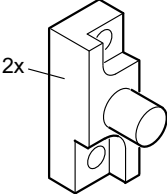
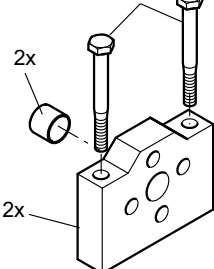
Pivot bearing mounting

The following figure shows the mounting option for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components.



65533AEN

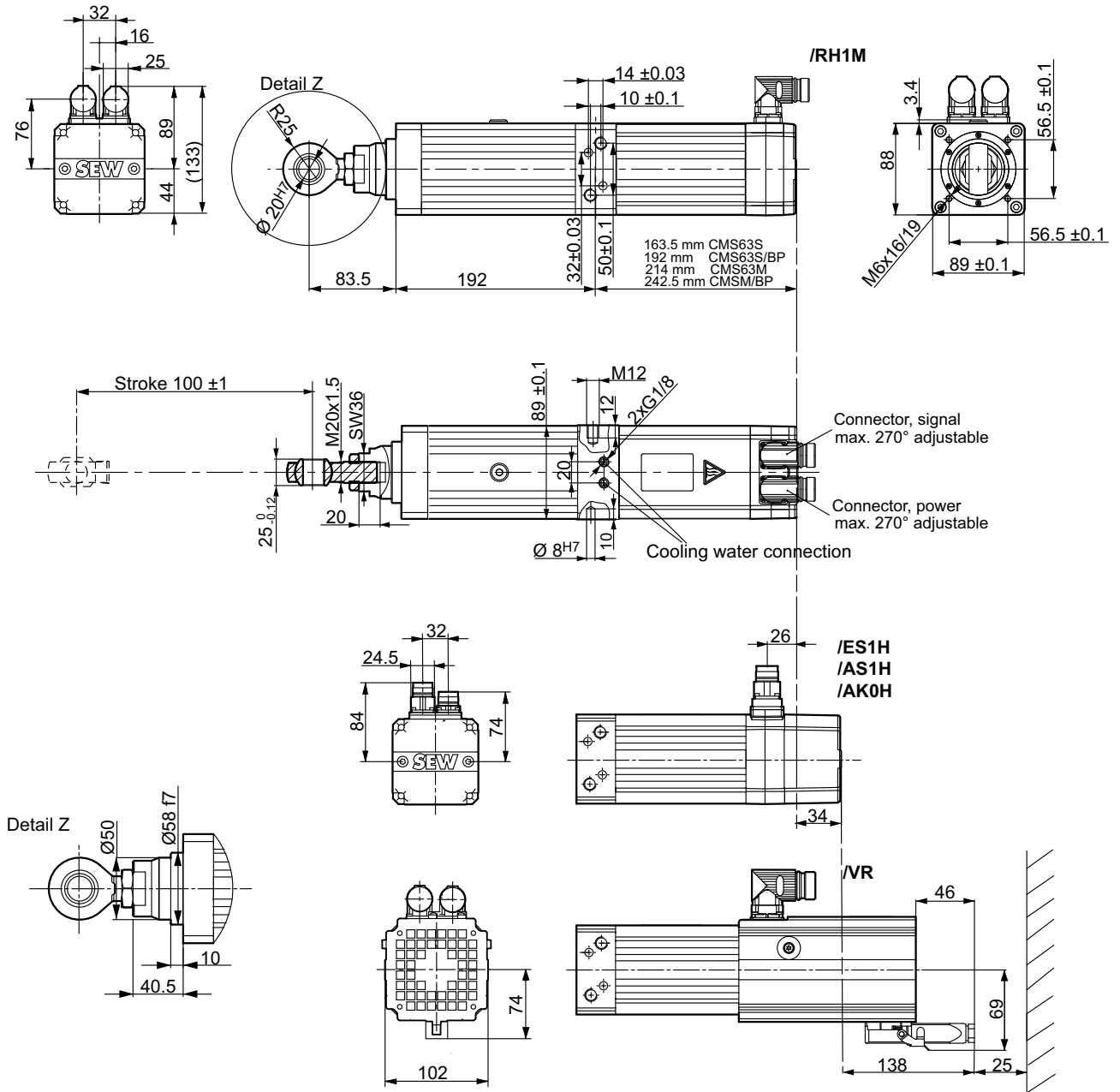
To mount the pivot bearing as shown, you will need the following parts:

Pivot bearing mounting kit (SEW part no.: 1333 3313)	Flange mounting kit (SEW part no.: 1333 3305)
 <p>2x</p> <p>Weight: 0.23 kg</p>	 <p>4x</p> <p>2x</p> <p>2x</p> <p>Weight: 0.65 kg</p>



5.5 CMS63S/M mounting dimensions

5.5.1 Mounting dimensions for a stroke length of 100 mm



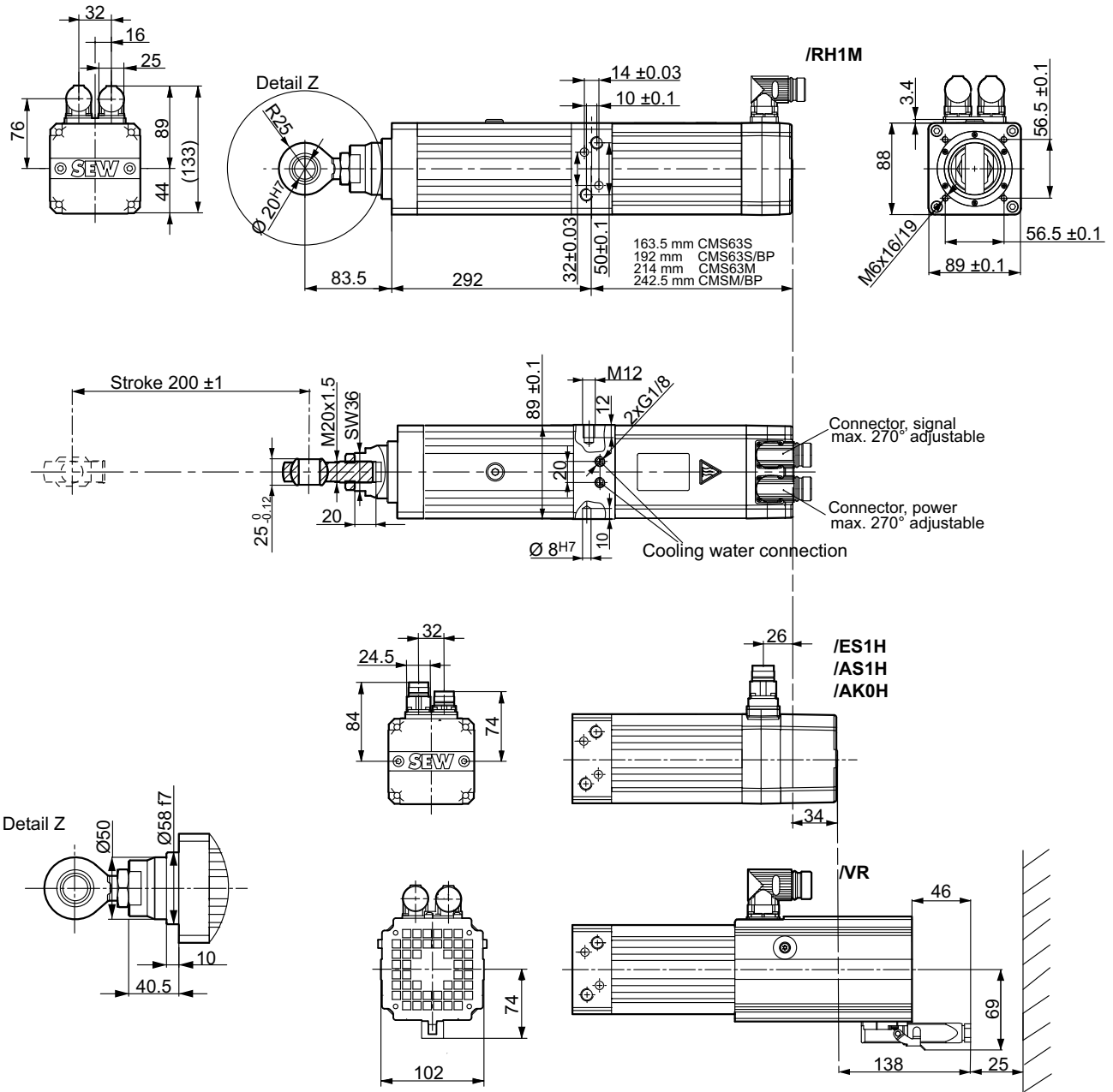
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Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.

Accessory bag (SEW part number: 1652 1137)		Weight: 0.15 kg
4x		4x

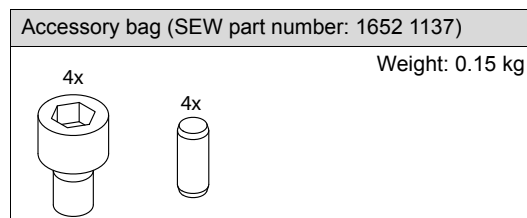


5.5.2 Mounting dimensions for a stroke length of 200 mm



65716AEN

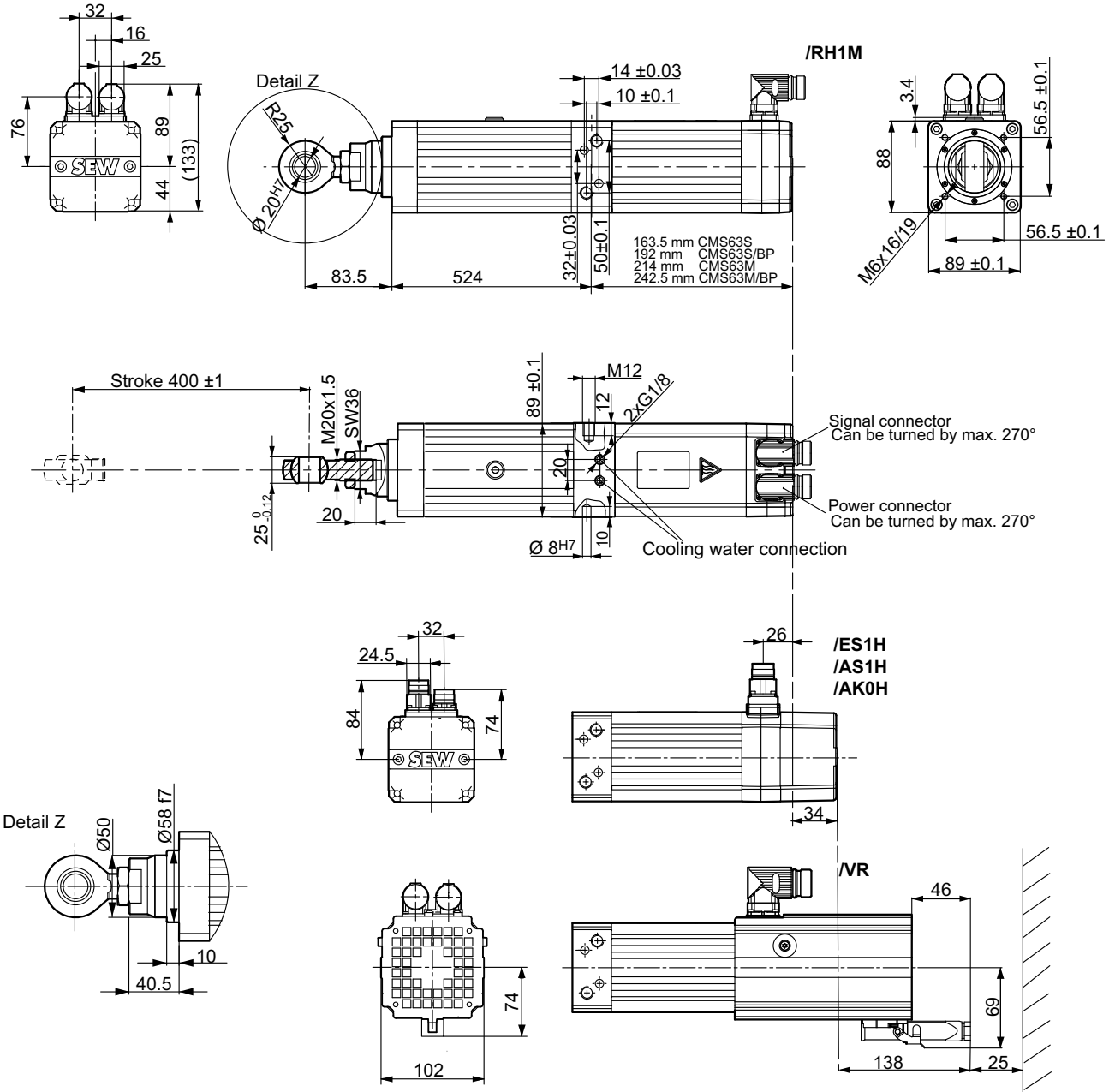
Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.





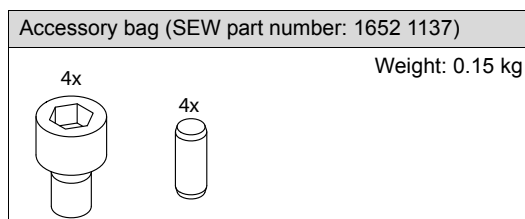
Mechanical Installation
CMS63S/M mounting dimensions

5.5.3 Mounting dimensions for a stroke length of 400 mm



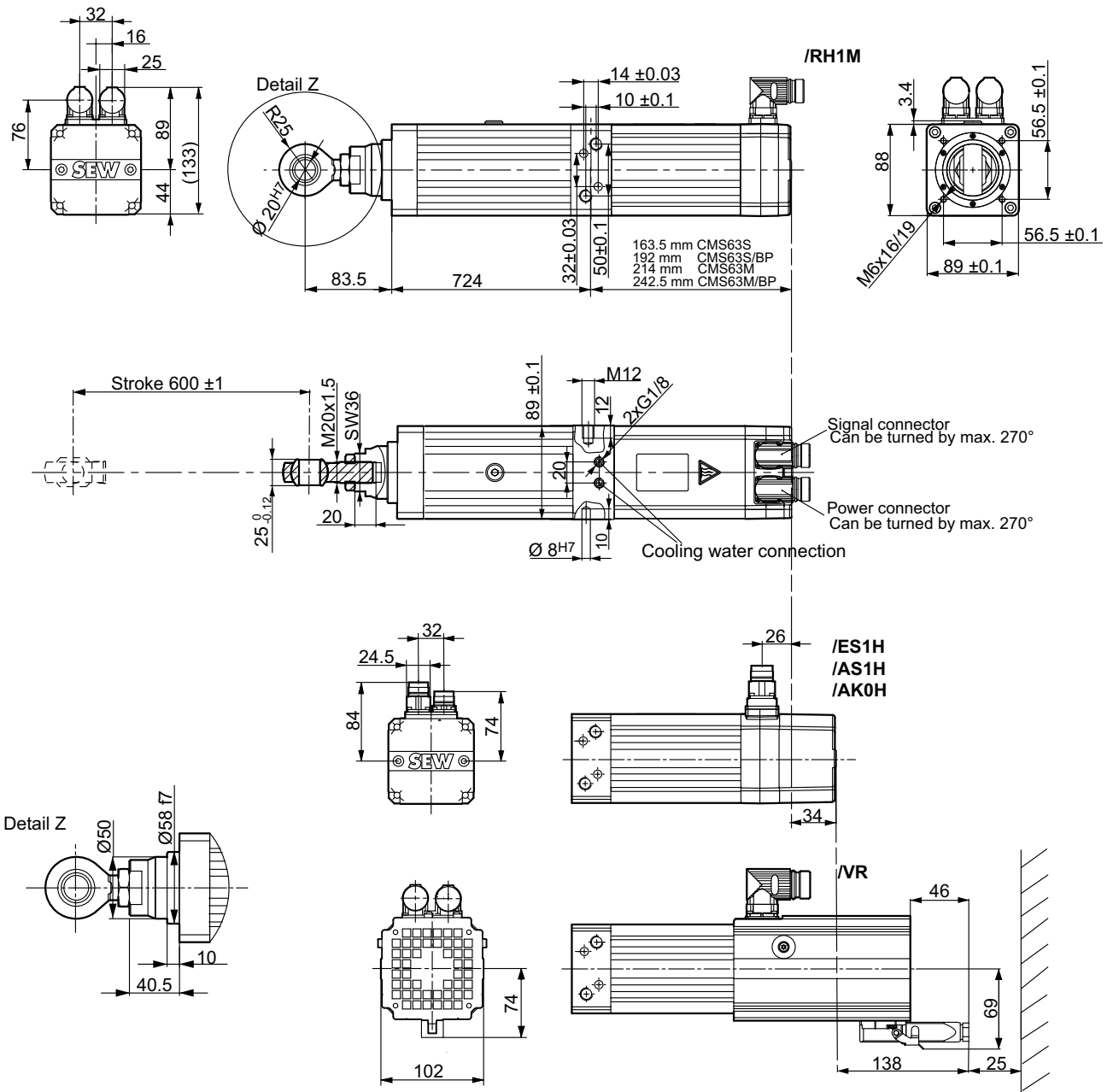
65975AEN

Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.



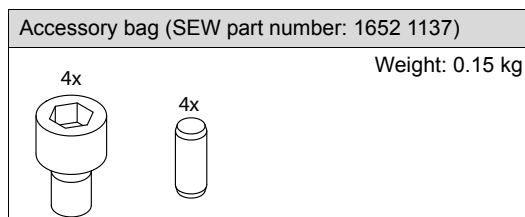


5.5.4 Mounting dimensions for a stroke length of 600 mm



65796AEN

Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.

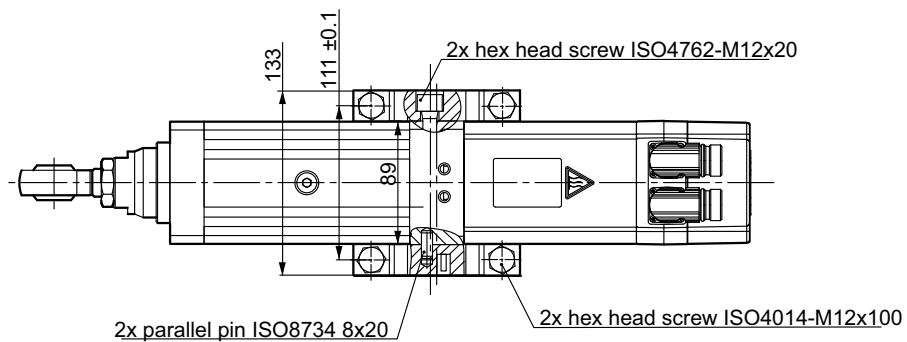
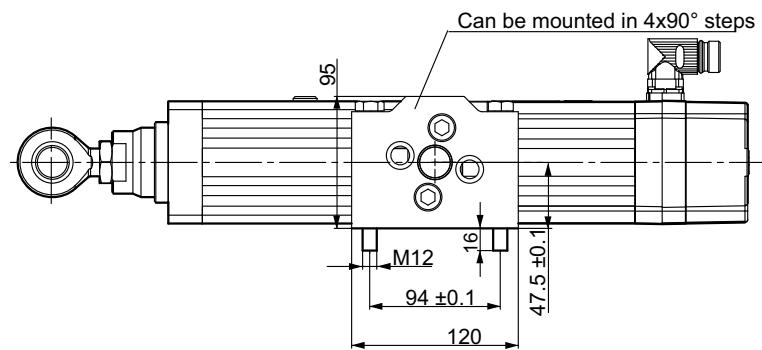
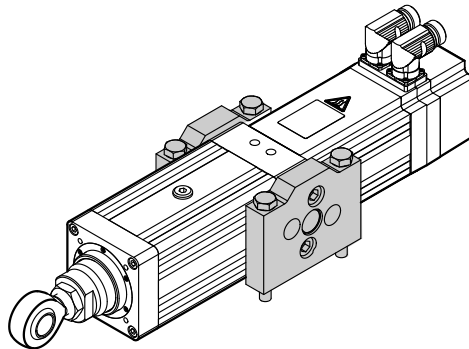




5.5.5 Additional mounting options

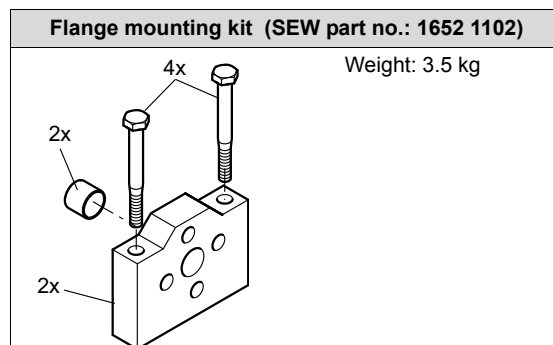
Flange mounting

The following figure shows the mounting option for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components. The mount-on components can be mounted in 90° steps.



64892AEN

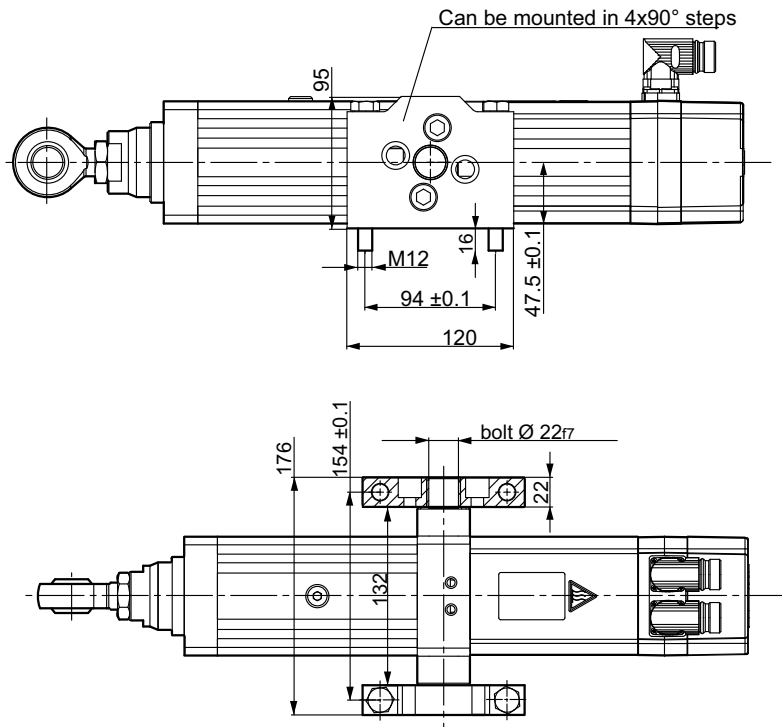
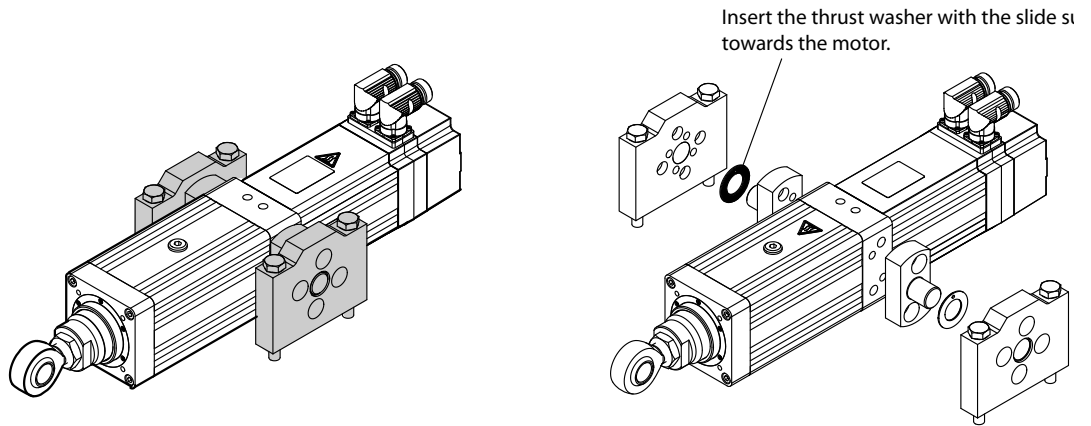
The flange mounting kit consists of the following parts:





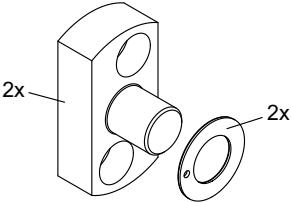
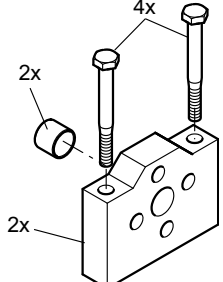
Pivot bearing mounting

The following figure shows the mounting option for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components.



64900AEN

To mount the pivot bearing as shown, you will need the following parts:

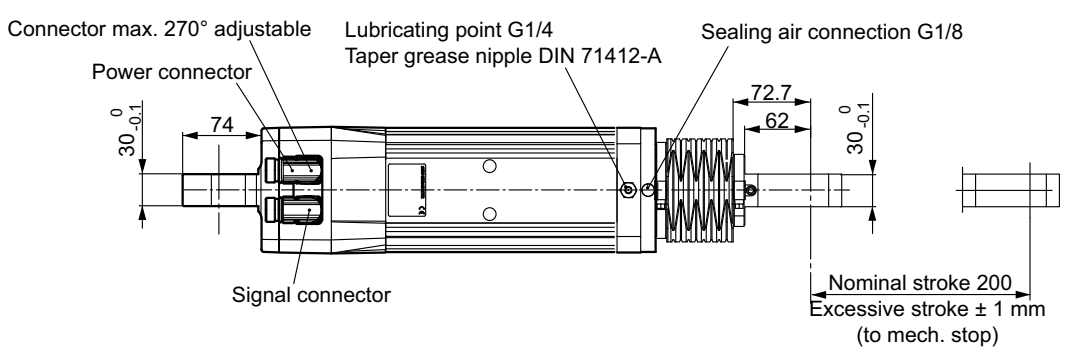
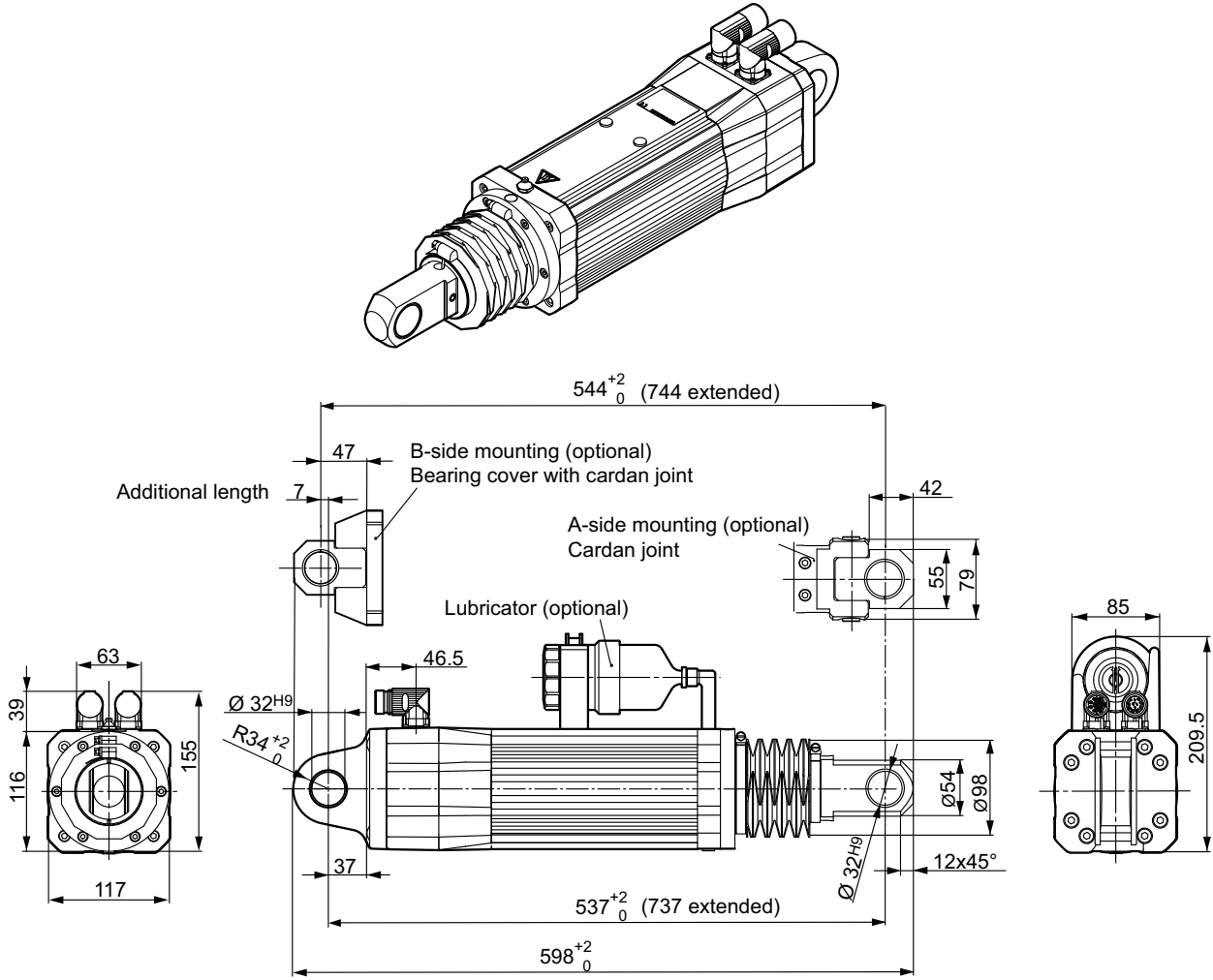
Pivot bearing mounting kit (SEW part no.: 1652 1129)	Flange mounting kit (SEW part no.: 1652 1102)
<p>Weight: 0.9 kg</p> 	<p>Weight: 3.5 kg</p> 



5.6 CMS71L mounting dimensions

	INFORMATION
	<p>The CMS71L electric cylinder variants with or without brake, with A-side cardan joint or with rigid rod end bearing have the same mounting dimensions. In the variant with B-side cardan joint, the distance between the two fastening bolts is 7 mm longer.</p>

5.6.1 Mounting dimensions of CMS71L/B/RH1M (resolver) for a stroke length of 200 mm

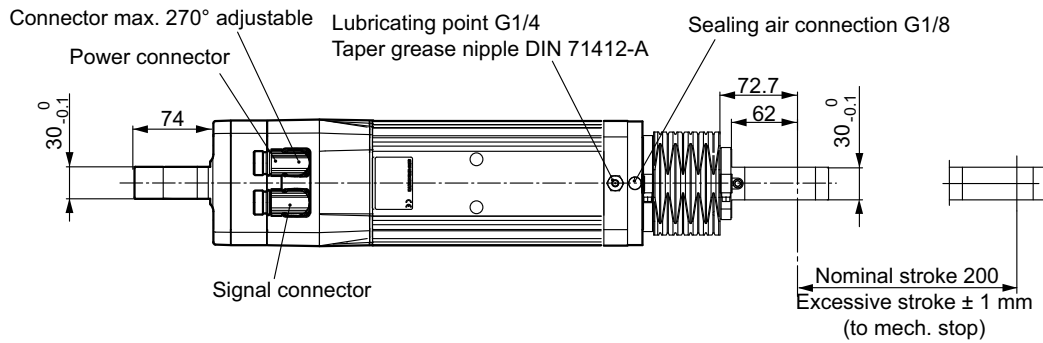
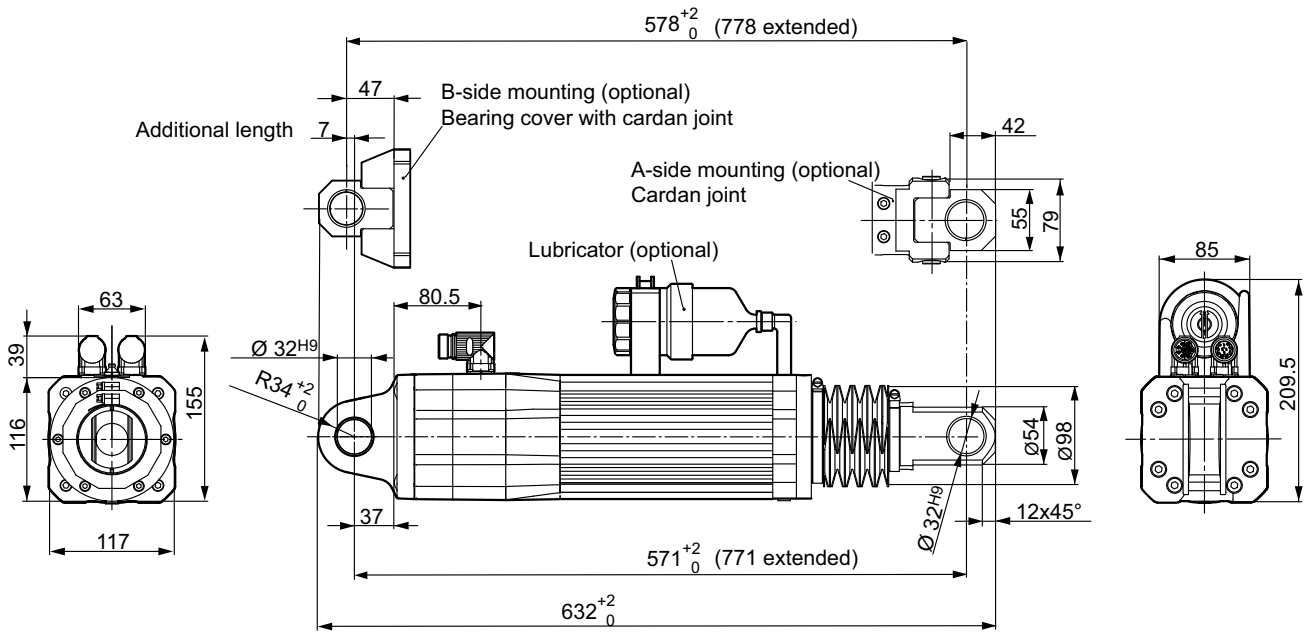


64920AEN



5.6.2 Mounting dimensions of CMS71L/B/AS1H (absolute encoder) for a stroke length of 200 mm

i	INFORMATION
	For variants with absolute encoder, the total length is 34 mm greater.

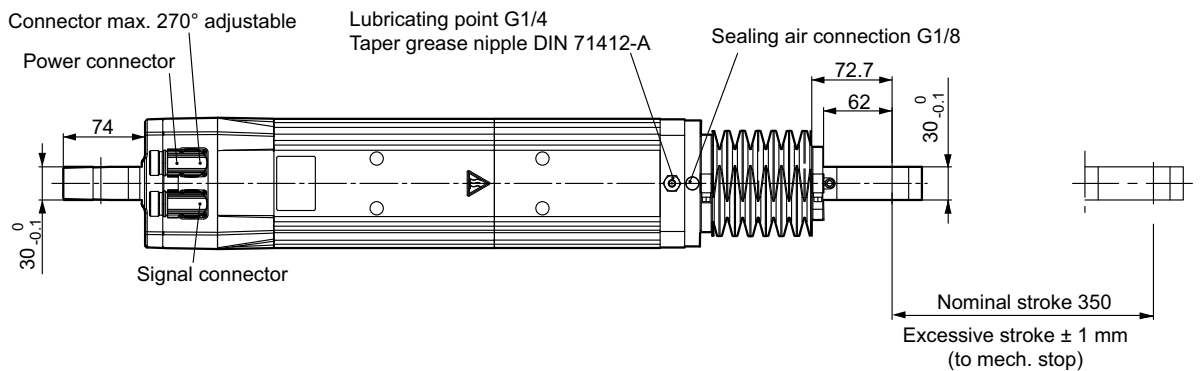
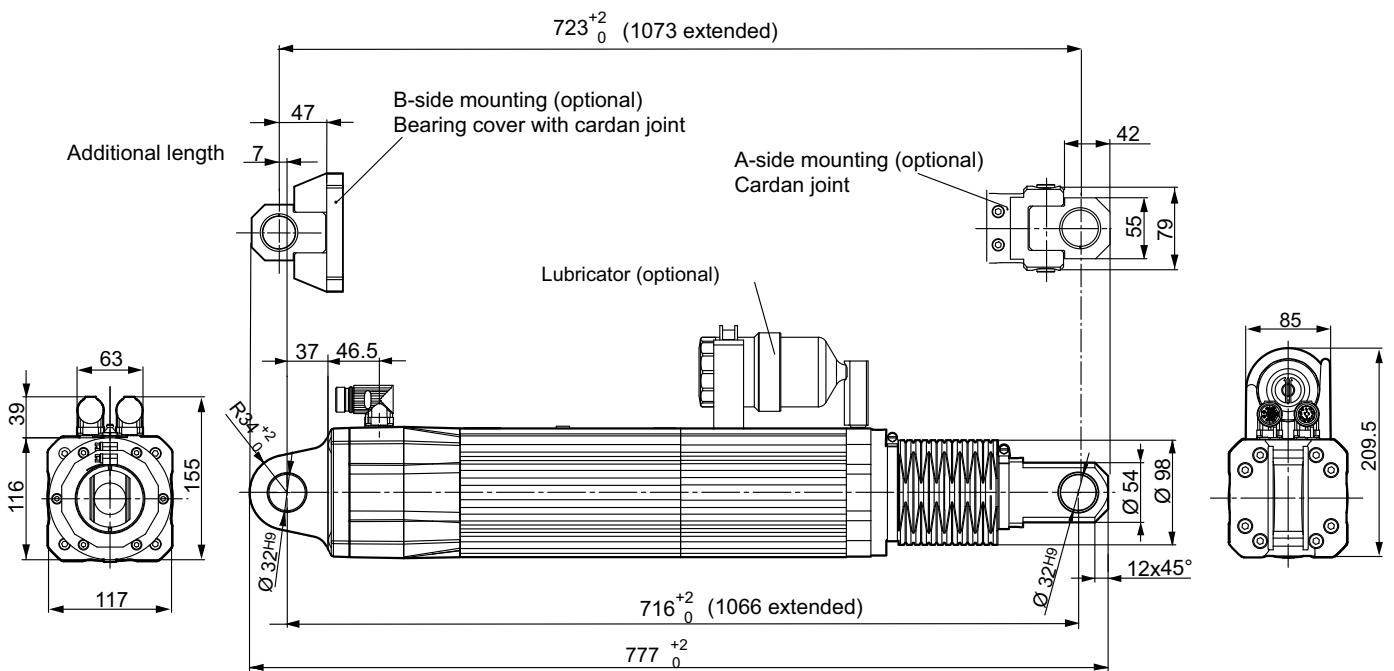
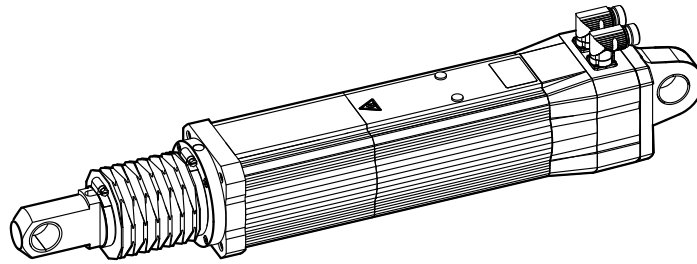


64921AEN



Mechanical Installation
CMS71L mounting dimensions

5.6.3 Mounting dimensions of CMS71L/B/RH1M (resolver) for a stroke length of 350 mm

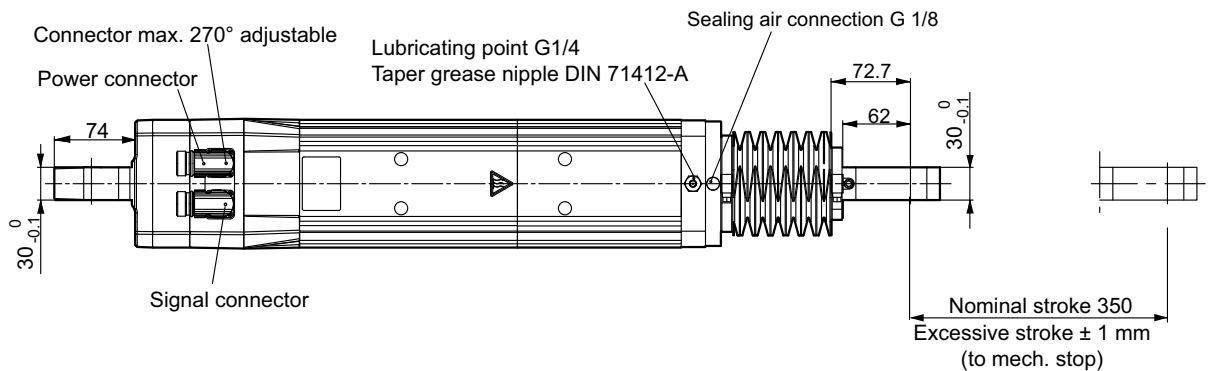
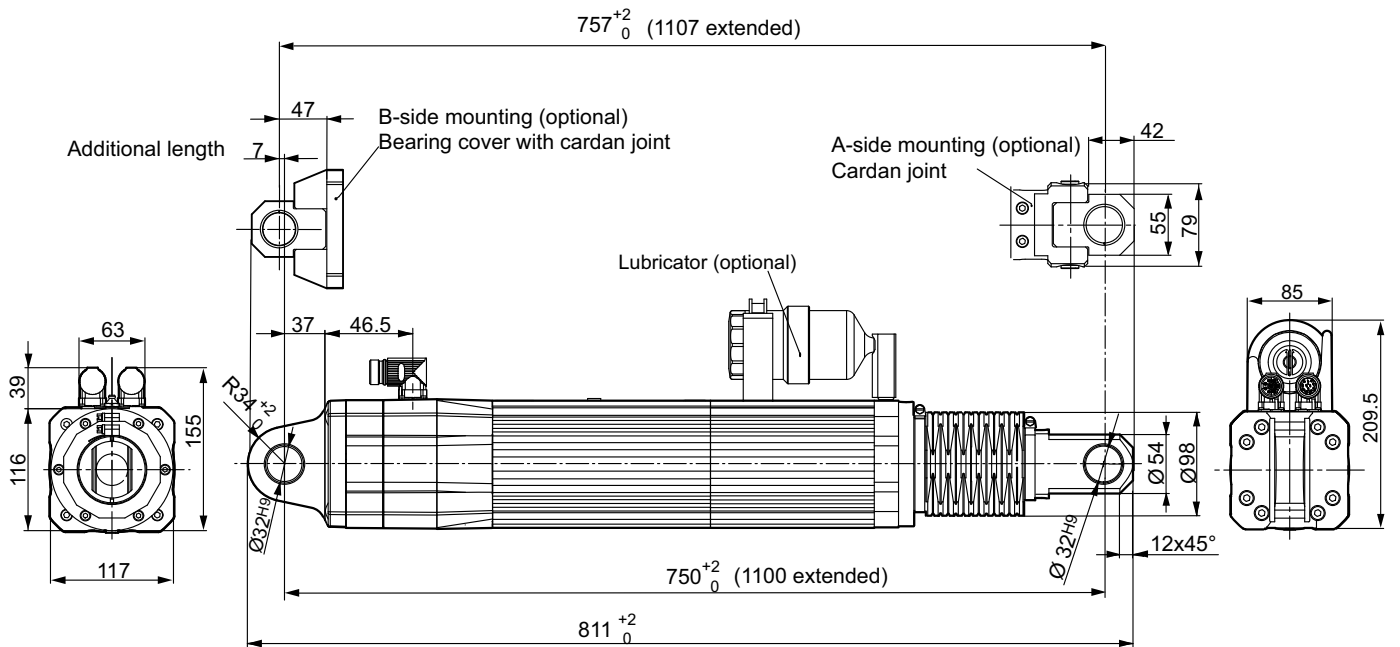
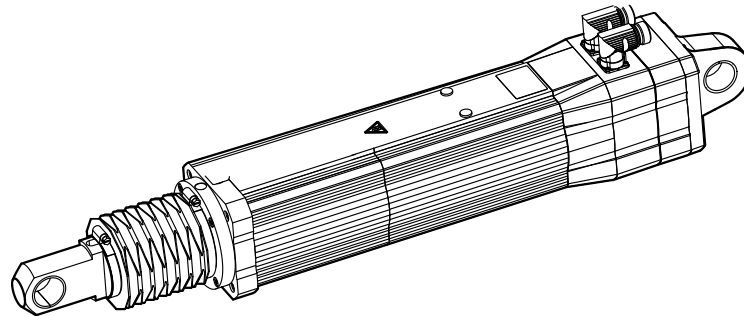


65038AEN



5.6.4 Mounting dimensions of CMS71L/B/AS1H (absolute encoder) for a stroke length of 350 mm

i	INFORMATION
	For variants with an absolute encoder, the total length is 34 mm greater.



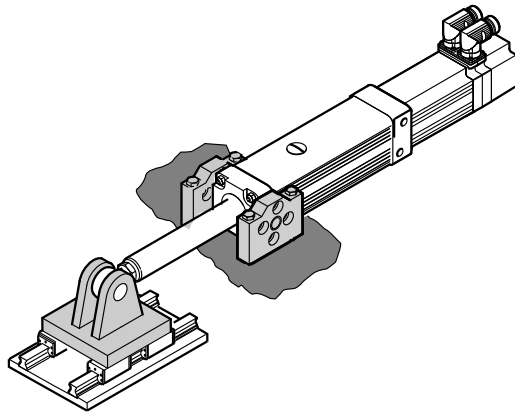
64922AEN



5.7 Mounting situation at customer site

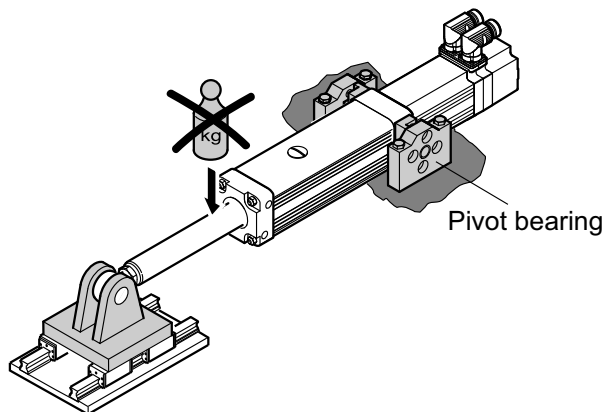
5.7.1 Mounting notes for CMS50/CMS63

- Attachment only on the output side of the piston rod is permitted only for the CMS types
 - CMS50S with 70 mm stroke
 - CMS63S with 100 mm strokewith/without brake.



65731AXX

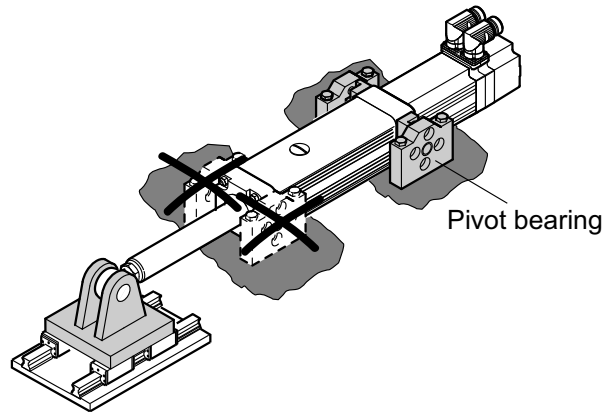
- No overhung loads on the drive



61369AEN

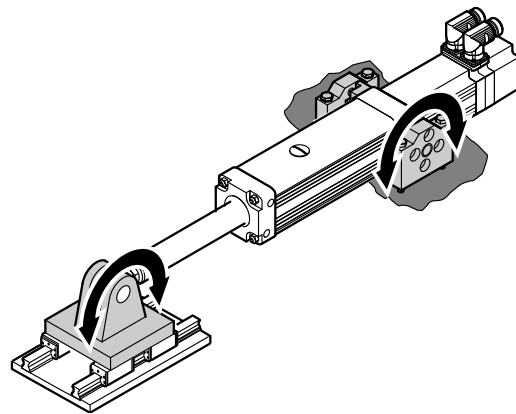


- No statically redundant mounting. When using a pivot bearing, do not use additional attachments.



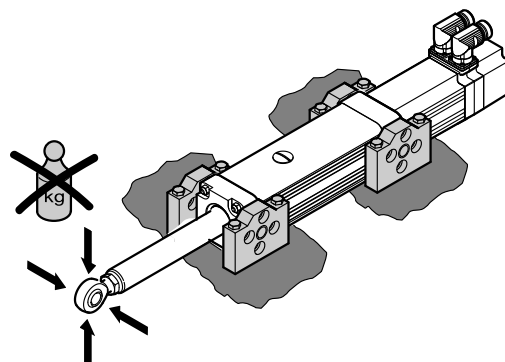
61372AEN

- Joint must be free to move; do not clamp in place.



61371AXX

- No overhung loads on the drive



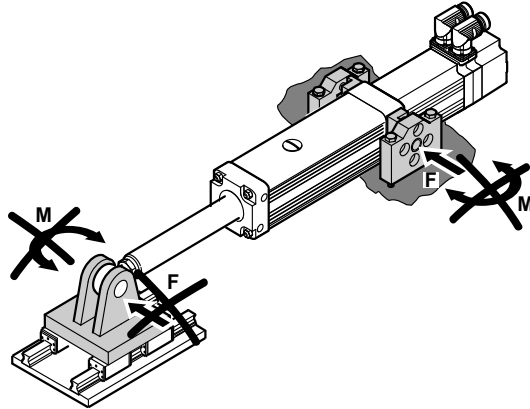
61379AXX



Mechanical Installation

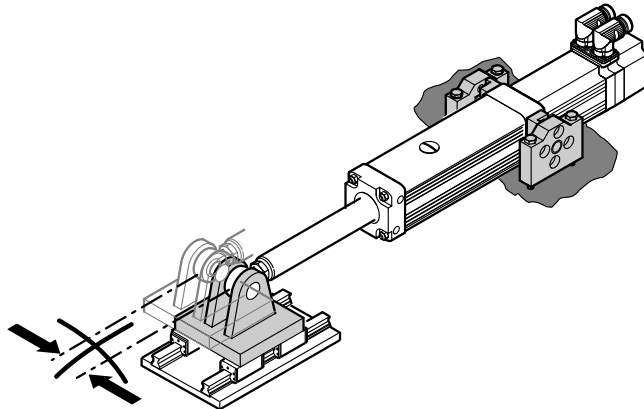
Mounting situation at customer site

- Do not induce loads and torques via joints



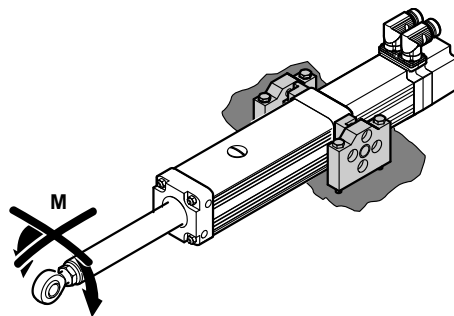
61374AXX

- Do not offset the installed components.



61376AXX

- Do not induce torque loads over the piston rod.

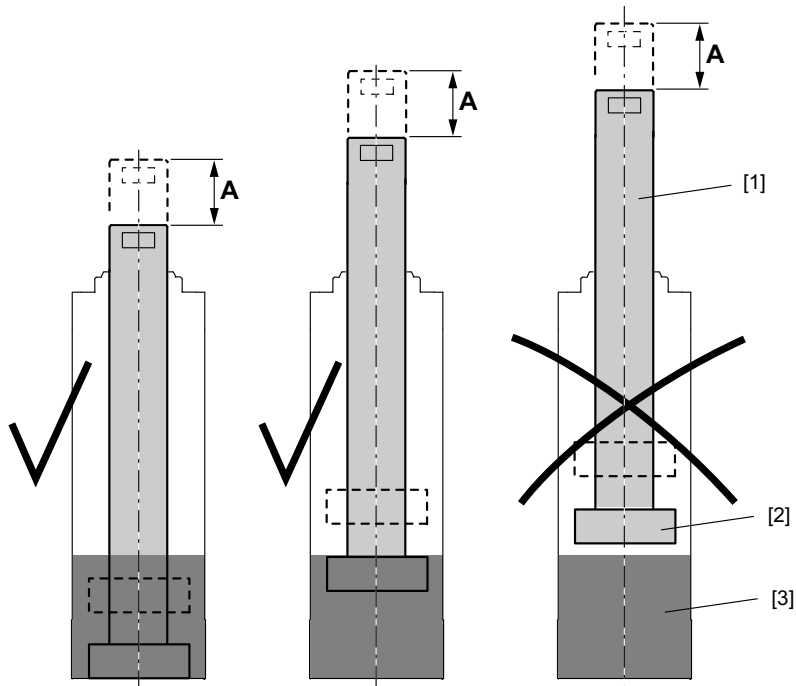


61377AXX



5.7.2 Mounting situation and stroke range of CMS63

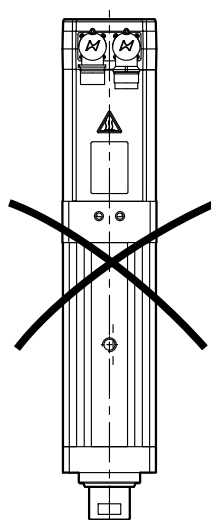
When mounting the electric cylinder, note that the spindle nut is not lubricated in case of incorrect stroke setting. For short working strokes, the end position of the spindle nut [2] must be lower than half the stroke length.



65737AXX

- [1] Piston rod
- [2] Spindle nut
- [3] Oil

The electric cylinder may not be mounted with the piston rod at the bottom.



65738AXX



INFORMATION

Electric cylinders for this mounting position will be available as of Q1 2010.

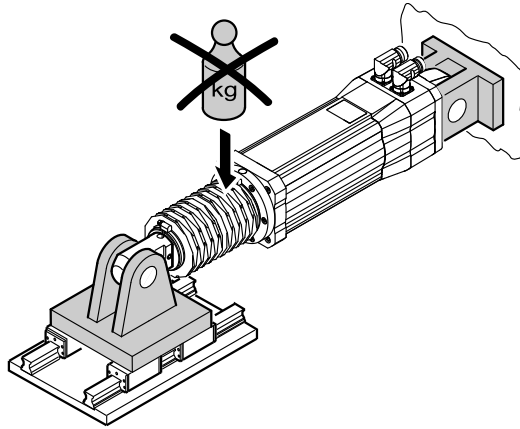


Mechanical Installation

Mounting situation at customer site

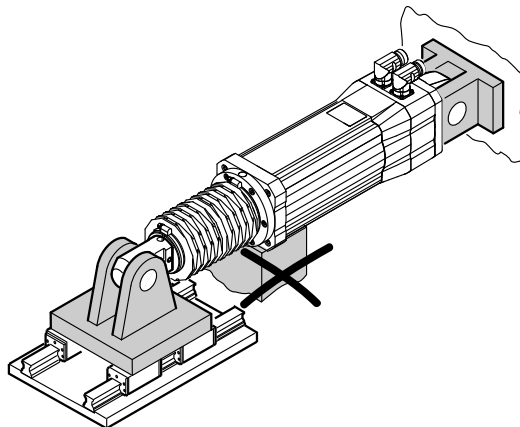
5.7.3 Installation notes CMS71L

- No overhung loads on the drive



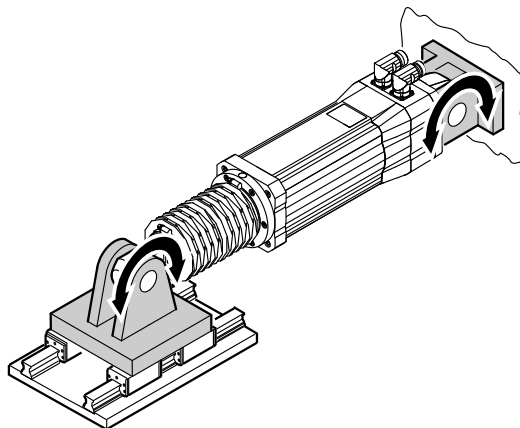
61173AXX

- No additional fastenings or supports (statically redundant)



61174AXX

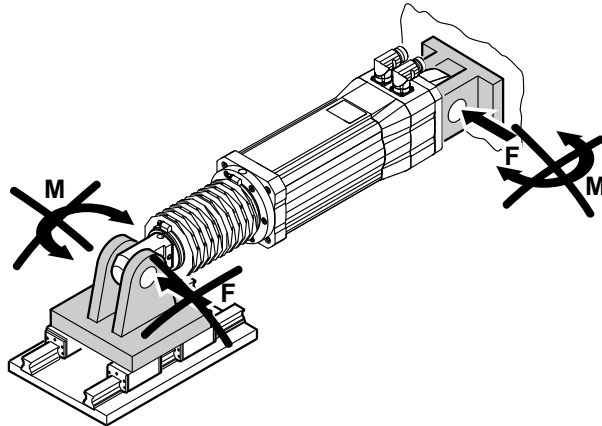
- Joints must be free to move; do not clamp in place.



61175AXX

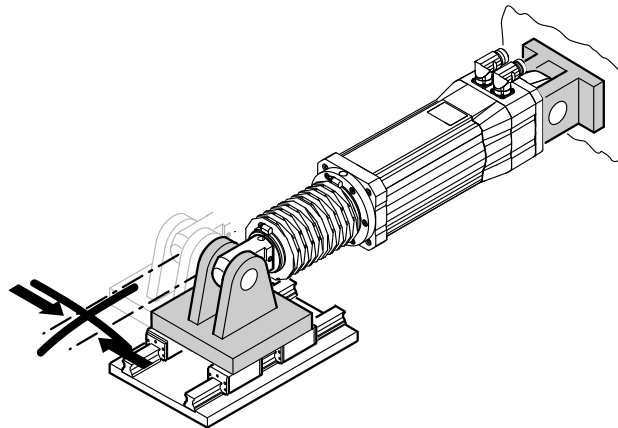


- Do not induce loads and torques via joints.



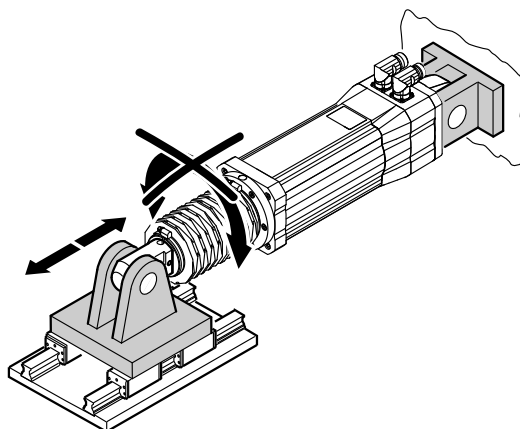
61176AXX

- Do not offset from the mounting position, see installation tolerances on page 54



61177AXX

- Install so that the unit is not subject to torque (torsion).



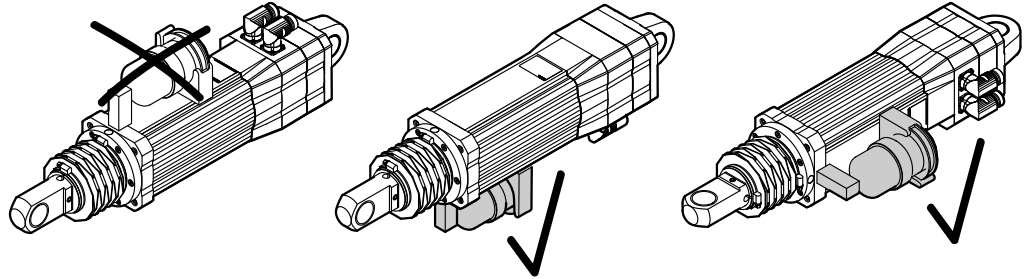
61178AXX



Mechanical Installation

Mounting situation at customer site

- For **horizontal** mounting position with lubricator option: position lubricator on the side or bottom. If this mounting situation cannot be avoided, contact SEW-EURODRIVE.



61504AXX



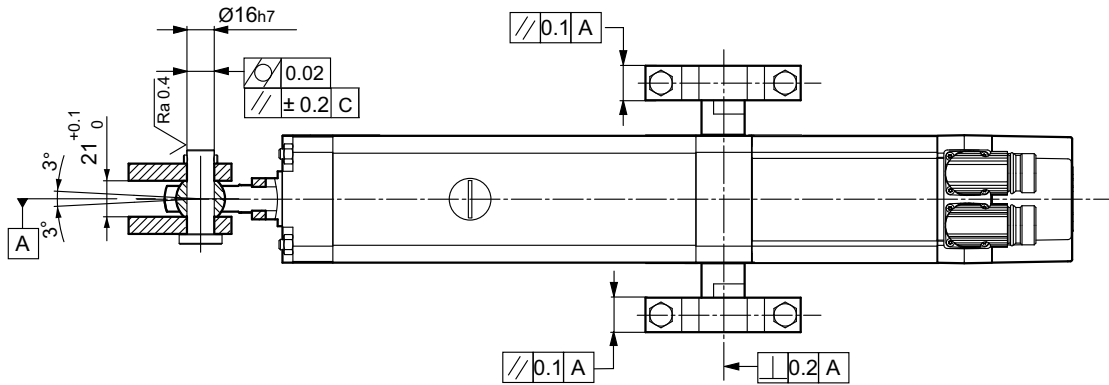
INFORMATION

In case of high thermal loads, dissipated heat can affect the lubricant properties.



5.7.4 Tolerances for mounting the CMS50S/M at the customer site

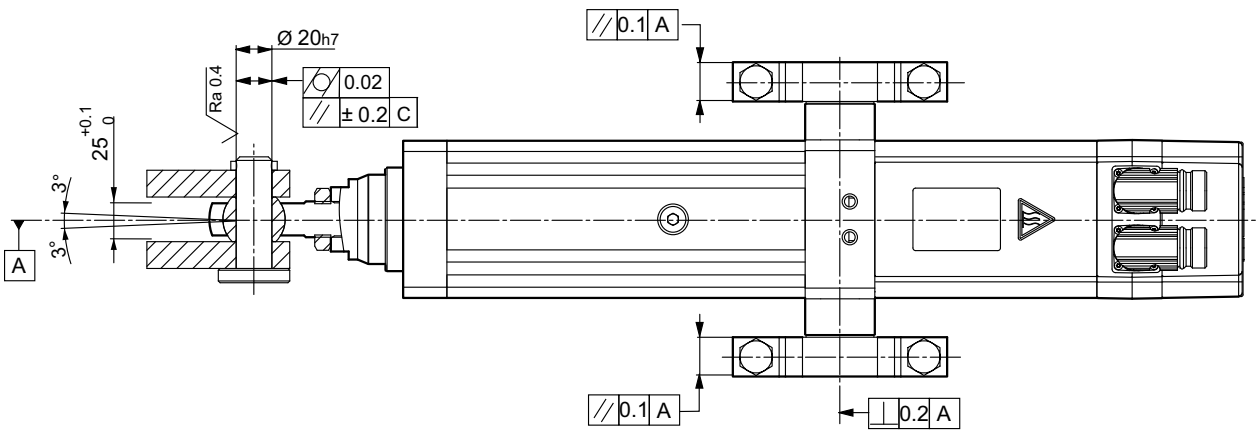
The following figure describes the mounting situation for both mounting sides of the drive.



61542AXX

5.7.5 Tolerances for mounting the CMS63S/M at the customer site

The following figure describes the mounting situation for both mounting sides of the drive.



65190AXX



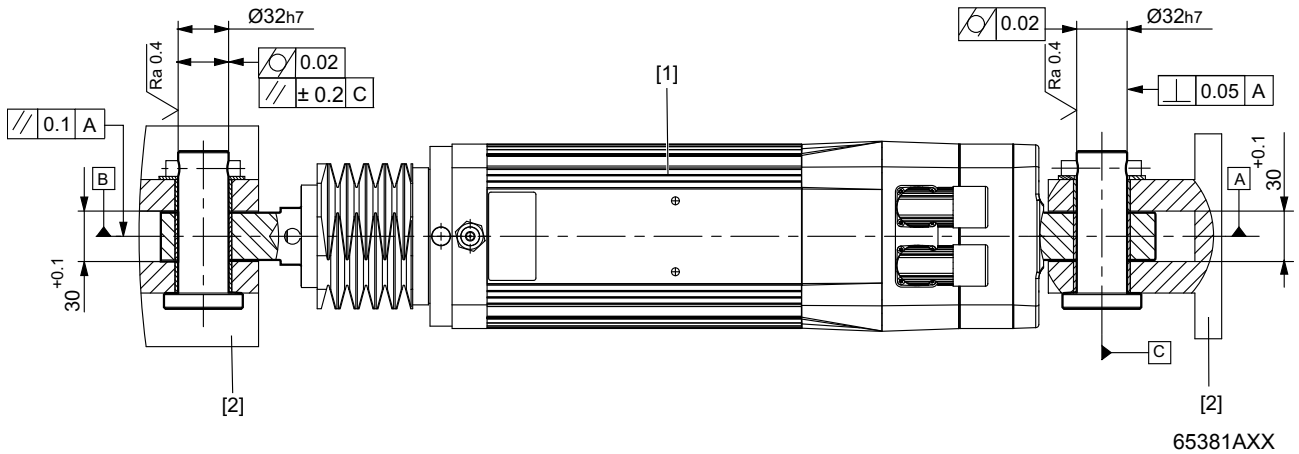
Mechanical Installation

Mounting situation at customer site

5.7.6 Tolerances for mounting the CMS71L at the customer site

The following figure describes the mounting situation for both mounting sides of the drive.

Default



- [1] CMS electric cylinder
[2] Customer supplied parts

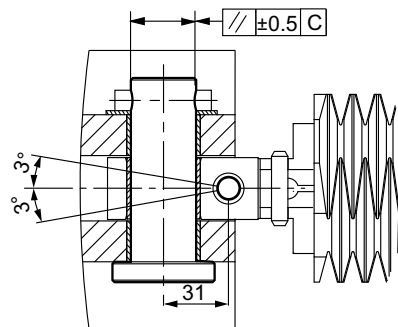
Note the following points:



INFORMATION

- The max. axial offset between A-B is 0.2 mm
- The parts supplied by the customer must meet the requirements described above.
- If mounting tolerances cannot be complied with, contact SEW-EURODRIVE. An electric cylinder with a cardan joint may fit the mounting situation.

Cardan joint



61543AXX

Note the following points:




INFORMATION

- The max. axial offset between A-B is 0.5 mm




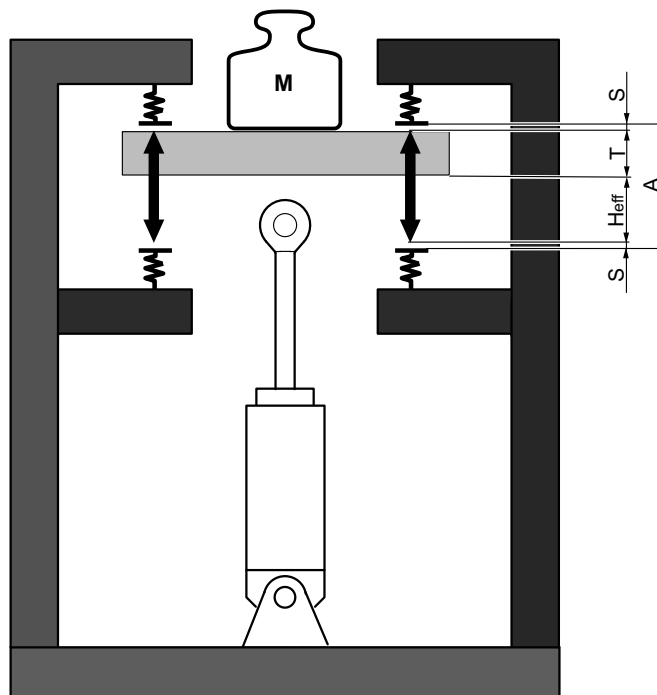
5.8 Mechanical stroke limiting

	STOP
	The customer must limit the stroke of the electric cylinder by providing for appropriate measures in the extended and retracted position, e.g. by using limit stops, cushioning or shock absorbers.

The mechanical limiting elements built-in by the customer must be able to absorb the reactive forces and kinetic energy that is created when the end position stops are reached in order to prevent the maximum permitted feed thrust of the electric cylinder from being exceeded. This requires soft, damping elements. Their purpose is to absorb the energy and then limit the end position mechanically. As a rule, you should use cushioning or shock absorbers that are dimensioned accordingly.

5.8.1 Mechanical stroke limiting

	STOP
	The rated stroke length (H_{CMS}), e.g. CMS71L stroke 200 mm, is only available in limited form for the customer application because safety distances (S) to the limit stops restrict the effective stroke (H_{eff}).



- | | | | |
|---------------|--------------------|-----|------------------------------|
| [H_{eff}] | Effective stroke | [A] | Distance between limit stops |
| [H_{CMS}] | Nominal stroke CMS | [T] | Partial width |
| [S] | Safety distance | [M] | Weight |

Calculating the effective stroke

The effective stroke can be calculated as follows:

$$H_{eff} = A - T - 2 \times S$$

or

$$H_{eff} = H_{CMS} - 2 \times S$$

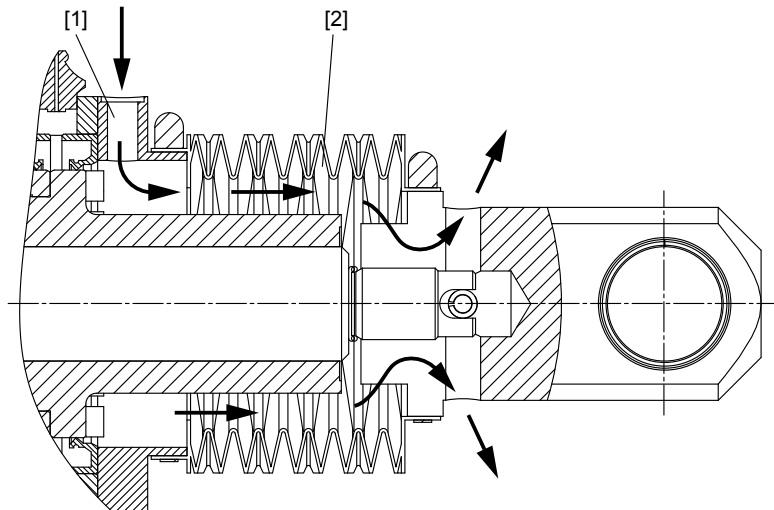
$$\rightarrow H_{eff} < H_{CMS}$$



5.9 Sealing air - CMS71 only

The drive is factory-equipped as standard with a sealing air connection [1], thread G1/8 (not CMS71M). Because of this, the electric cylinder can especially be used in dusty environments.

To do this, the space within the bellows [2] can be placed under slight positive pressure (max. 0.5 bar). The positive pressure prevents dust, etc., from entering into the motor.



61004AXX

[1] Sealing air connection
[2] Bellows

The required compressed air volume flow ($V_{\text{sealing air}}$) depends on the travel velocity (v) of the screw drive.

$V_{\text{sealing air}} \geq 300 \times v$	Volume flow $V_{\text{sealing air}}$ [liters/min]
	Travel speed v [m/s]

This ensures that sufficient pressurized air flows in during extension and that no negative pressure develops in the space [2].

The pressurized air must be dry and free of oil, according to DIN-ISO 8573-1 class 3 (common in pressurized air systems).

Example:

Traveling velocity: 0.5 m/s

$$V_{\text{sealing air}} \geq 300 \times 0.5 \text{ m/s} \geq 150/\text{min}$$



5.10 Filter ventilation - not part of delivery from SEW - CMS71 only

If the electric cylinder is used in dusty environments, you must make sure that no dust is sucked in through the vent [4] of the bellows in the joint during the lifting motion.

There are two possibilities to do so:

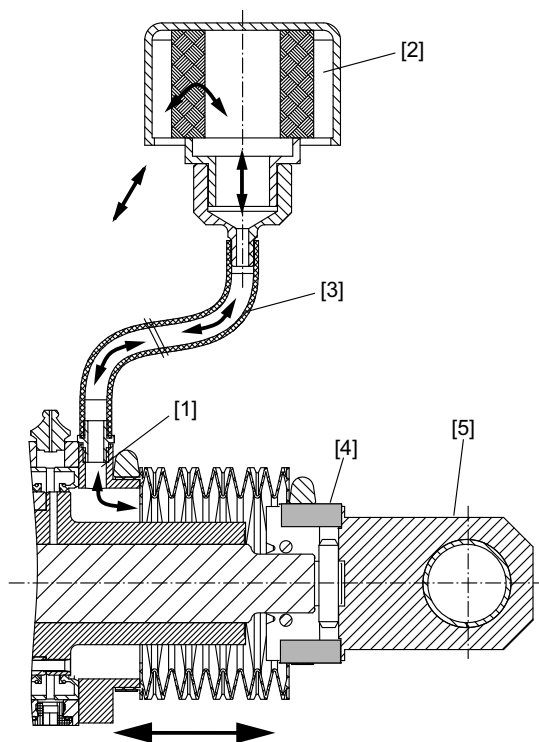
- Sealing air (see page 56)
- Filter ventilation (no compressed air required)

For this purpose, a suitable filter [2] is installed at the sealing air connection [1] with G1/8 thread. If there is not enough space, the filter can be connected to the electric cylinder via a hose [3]. Max. hose length 1 m, inner diameter > 9 mm.

We recommend a filter of the company Argo-Hytos (<http://www.argo-hytos.com>), type L1.0807-11. This is an inexpensive filter that is used to vent hydraulic containers of construction machines.

It safely keeps back dust particles < 3 µm under very low pressure. Other filters, such as pneumatic mufflers, sintered metal filters, etc., may not be used.

In addition to this, the default ventilation via the joint must be sealed. The sealed joint can be ordered under "Option without bellows ventilation" or retrofitted using 2 x sealing element [4], SEW part no. 13342093. Older versions are sealed with rubber.



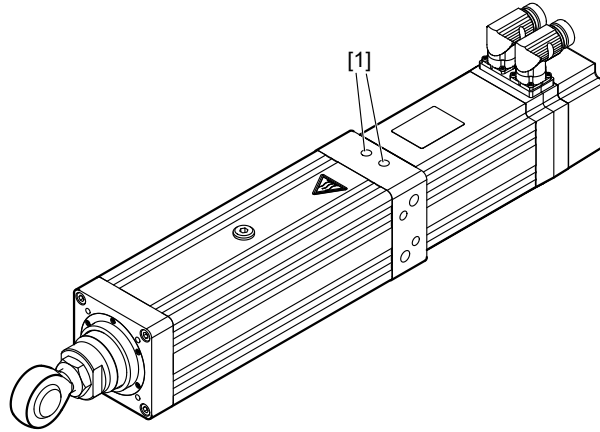
65764AXX

- [1] Sealing air connection
- [2] Filter
- [3] Hose
- [4] Sealing element
- [5] Joint



5.11 Water cooling for CMS63

CMS63 is factory-equipped as standard with a connection option for water cooling. The inlet and outlet connections for the cooling water can be swapped.



65925AXX

[1] Cooling water connection 2x G1/8 (flange seal and screw fitting supplied by the customer)

Water cooling can increase the thermal capacity of the drive by up to 25%. The data for water cooling in the power diagrams for the thermal limit torque are based on the following operating parameters:

- Temperature of cooling water inlet 25 °C
- Temperature increase at cooling water outlet about 5 °C
- Flow rate 4 l/min

Higher flow rates increase the cooling effect only slightly.


Cooling water requirements:


- Max. operating pressure 2 bar
- Demineralized and desalinated
- No foreign objects and sediments
- Frost protection, if necessary


The components through which the cooling waters flows are corrosion-protected. The cooling water must not contain any chemically aggressive additives; contact SEW if necessary.



6 Electrical Installation

	! DANGER
	<p>Danger of electric shock.</p> <p>Severe or fatal injuries!</p> <ul style="list-style-type: none"> • It is essential to comply with the safety notes in chapter 2 during installation. • Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake. • Use switch contacts in utilization category DC-3 to EN 60947-4-1 for connecting the brake to DC 24 V. • When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer. • It is essential to observe the operating instructions supplied with the servo inverter.


	! CAUTION
	<p>Use switch contacts in utilization category AC-3 to EN 60947-4-1 for connecting the electric cylinder and brake.</p> <p>Use switch contacts in utilization category DC-3 to EN 60947-4-1 for connecting the brake to DC 24 V.</p>

	INFORMATION
	<p>A bag containing the following information is attached to the motor:</p> <ul style="list-style-type: none"> • Safety notes • Wiring diagram <p>You must comply with this information.</p>



6.1 Connector installation

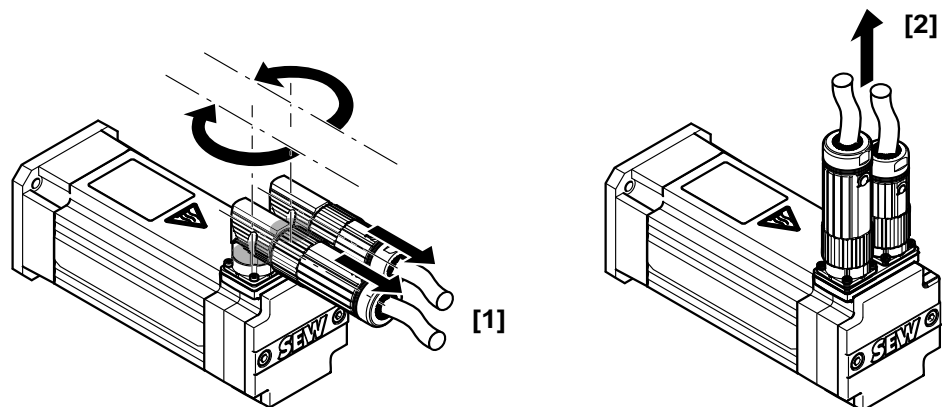
The cable entry of the power and signal cable is installed using an adjustable right-angle connector. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required without using additional tools. A torque of $> 8 \text{ Nm}$ is required to adjust the connector.

	STOP
	<p>Possible damage of the right-angle connector in case of rotation without mating connector.</p> <p>Do not use pliers to adjust the right-angle connector before connecting it.</p> <p>Result:</p> <ul style="list-style-type: none"> • Destruction of the thread. • Leakage due to damaged sealing surface.

Connector position

An "adjustable" position has been defined for right-angle, adjustable connectors [1]. This is the standard connector position. It corresponds to connector position "3".


A "radial" position has been defined for the straight plug connectors (radial output). Radial plug connectors [2] are optional.



[1] Connector position "adjustable"


[2] Connector position "radial"

63831AXX

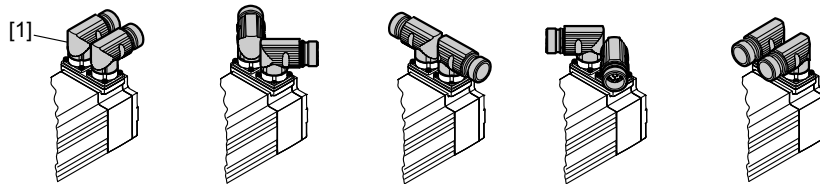
	INFORMATION
	<ul style="list-style-type: none"> • Comply with the permitted bending radii of the cables. • When using low-capacity trailing cables, the bending radii are larger than for the previously used standard cables. • SEW-EURODRIVE recommends the use of low-capacity cables.



The right-angle plug connectors can be rotated to achieve the required position.

	INFORMATION
	<p>The connector should only be rotated to install and connect the motor. Do not turn the plug connector regularly once it has been installed.</p>

Exemplary positions of the adjustable connectors



64870AXX

6.2 Wiring information


6.2.1 Protecting the brake control system against interference

To protect the brake control system against interference, do not route unshielded brake cables together with switched-mode power cables.

Switched-mode power cables include in particular:

- Output cables from servo inverters, converters, soft start units and brake units
- Supply cables to braking resistors and similar.

6.2.2 Thermal motor protection

	STOP
	<p>Electromagnetic interference of the drives. Install the connecting lead of the KTY separately from other power cables, maintaining a distance of at least 200 mm. The cables can only be routed together if either the KTY cable or the power cable is shielded.</p>



6.3 Connecting motor and encoders system via SM./SB. plug connectors

Electric cylinders are supplied with the SM. / SB. plug connector system.

In the basic version, SEW-EURODRIVE delivers electric cylinders with right-angle connector on the motor end and without mating connector. The encoder system is connected using a separate, 12-pin round plug connector.

The mating connectors can be ordered separately or together with the motor.

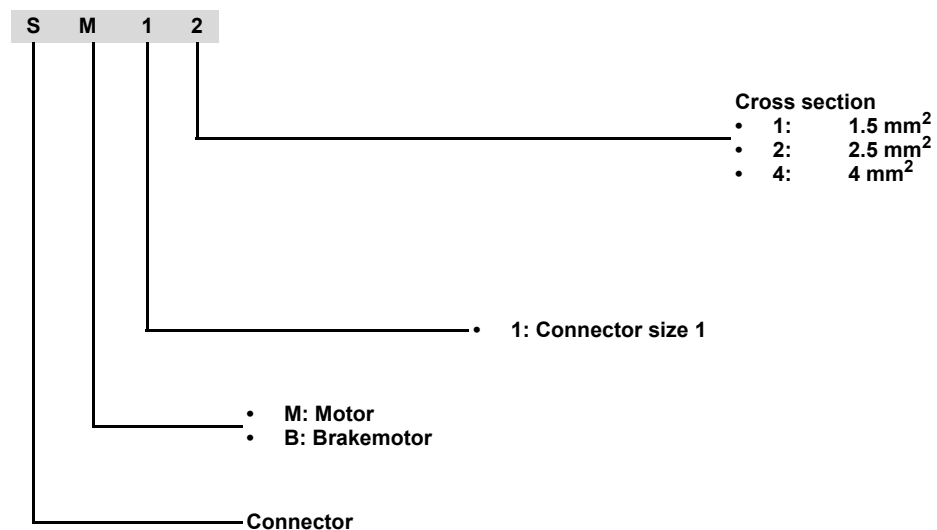
	STOP
	<p>Adjusting the right-angle connector regularly can cause irreparable damage.</p> <p>Do not align the right-angle connector frequently.</p>

All electric motors are equipped with quick-lock right-angle connectors (SpeedTec). If you use connectors without quick lock, the O-ring serves as vibration protector. The connector can only be screwed on until it reaches the O-ring. The connector is always sealed at the bottom.

If you use self-assembled cables with quick lock, you must remove the O-ring.

6.3.1 Plug connector on the cable end

Unit designation of the plug connectors





Motor cable

Type	Speed	To cable lengths	Cable part no.		Core cross section	To cable lengths	Cable part no.		Core cross section
			Fixed installation	Cable carrier installation			Fixed installation	Cable carrier installation	
	[min ⁻¹]	[m]	Stand-alone motor	Stand-alone motor	[mm ²]	[m]	Stand-alone motor	Stand-alone motor	[mm ²]
CMS50S	3000	100	05904544	05906245	1.5	100	05904552	05906253	2.5
	4500								
	6000								
CMS50M	3000								
	4500								
	6000								
CMS63S	3000								
	4500								
	6000								
CMS63M	3000	90	05904544	05906245	1.5	100	05904552	05906253	2.5
	4500								
	6000								
CMS71L	2000	100	05904544	05906245	1.5	100	05904552	05906253	2.5
	3000								
	4500	70	05904544	05906245	1.5	100	05904552	05906253	2.5

Brakemotor cable

Type	Speed	To cable lengths	Cable part no.		Core cross section	To cable lengths	Cable part no.		Core cross section								
			Fixed installation	Cable carrier installation			Fixed installation	Cable carrier installation									
	[min ⁻¹]	[m]	Brakemotor	Brakemotor	[mm ²]	[m]	Brakemotor	Brakemotor	[mm ²]								
CMS50S	3000	100	13354345	13354388	1.5	100	13354353	13354396	2.5								
	4500																
	6000																
CMS50M	3000																
	4500																
	6000																
CMS63S	3000									90	13354345	13354388	1.5	100	13354353	13354396	2.5
	4500																
	6000																
CMS63M	3000	100	13354345	13354388	1.5	100	13354353	13354396	2.5								
	4500																
	6000																
CMS71L	2000	100	13354345	13354388	1.5	100	13354353	13354396	2.5								
	3000																
	4500	70	13354345	13354388	1.5	100	13354353	13354396	2.5								



Dependence of mating connector on cable diameter and crimping area

SM1 / SB1 connector type	Crimping area U, V, W, PE [mm ²]	Cable crimping diameter [mm]
01986740	0.35 - 2.5	9 - 14
01989197	0.35 - 2.5	14 - 17
01991639	2.5 - 4	12 - 17

The connector service packs also contain the brake pins, so that no difference needs to be made between motor and brakemotor.

Replaced brakemotor cables


The brake cores of the replaced brakemotor cables are labeled differently from today's standard. This applies to the following cables:

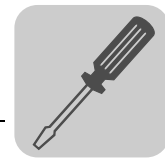
Cable type	Cable type	Connector type	Cable cross section [mm ²]	Part number	
				Prefabricated cables	Spare power connector*
Fixed installation	Brakemotor cable ¹⁾	SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1332 4853	0198 6740
		SB12	4 x 2.5 mm ² + 2 x 1 mm ²	1332 2139	0198 6740
		SB14	4 x 4 mm ² + 2 x 1 mm ²	1332 2147	0199 1639
Cable carrier installation	Brakemotor cable ¹⁾	SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1333 1221	0198 9197
		SB12	4 x 2.5 mm ² + 2 x 1 mm ²	1333 2155	0198 9197
		SB14	4 x 4 mm ² + 2 x 1 mm ²	1333 2163	0199 1639

1) BP brake: 3-core cable, only 2 cores are used

* The complete connector service pack always includes the following parts:

- Power connector,
- Insulation inserts,
- Socket contacts.

	INFORMATION
	<p>The current part numbers are derived from the previous part numbers of the DS56 motor. You can continue to use the old numbers, but note the deviating assignment of the contacts C and D.</p> <p>The polarity of the connection is irrelevant for the BP brake. For the BS brake of the CMS71L, the polarity must be correct.</p>



6.3.2 Feedback and forced cooling fan cable

Feedback cable

Cable type		Cable cross section [mm ²]	FI type	Part number	
				Prefabricated cables	Signal connector*
Fixed installation	Resolver cable	5 x 2 x 0.25 mm ²	MOVIDRIVE®	0199 4875	0198 6732
			MOVIAXIS®	1332 7429	
Cable carrier installation			MOVIDRIVE®	0199 3194	
			MOVIAXIS®	1332 7437	
Fixed installation	HIPER-FACE® cable	6 x 2 x 0.25 mm ²	MOVIDRIVE® / MOVIAXIS®	1332 4535	0198 6732
Cable carrier installation			MOVIDRIVE® / MOVIAXIS®	1332 4551	

* The complete connector service pack always includes the following parts:

- Feedback connector,
- Insulation inserts,
- Socket contacts.

Forced cooling fan cable

Cable type		Cable cross section [mm ²]	Part number
Fixed installation	Forced cooling fan cable	3 x 1 mm ²	0198 6341
Cable carrier installation		3 x 1 mm ²	0199 560X

6.3.3 Prefabricated cables

Prefabricated cables are available from SEW-EURODRIVE to connect the SM./SB. plug connector system. For information on the prefabricated cables, refer to the "Electric Cylinder" catalog.

The plug connectors are depicted with the connector assignment on the cable at the connection side (back).

Note the following points if you want to assemble the cables yourself:

- The assembly of the signal plug connectors and of the SM. / SB. power plug connectors is described in the following chapters.
- The socket contacts for the motor connection are implemented as crimping contacts. Only use suitable tools for crimping.
- Strip the insulation off the connection leads, page 91. Apply shrink tubing to the connectors.
- Incorrectly installed socket contacts can be removed without removal tools.



Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

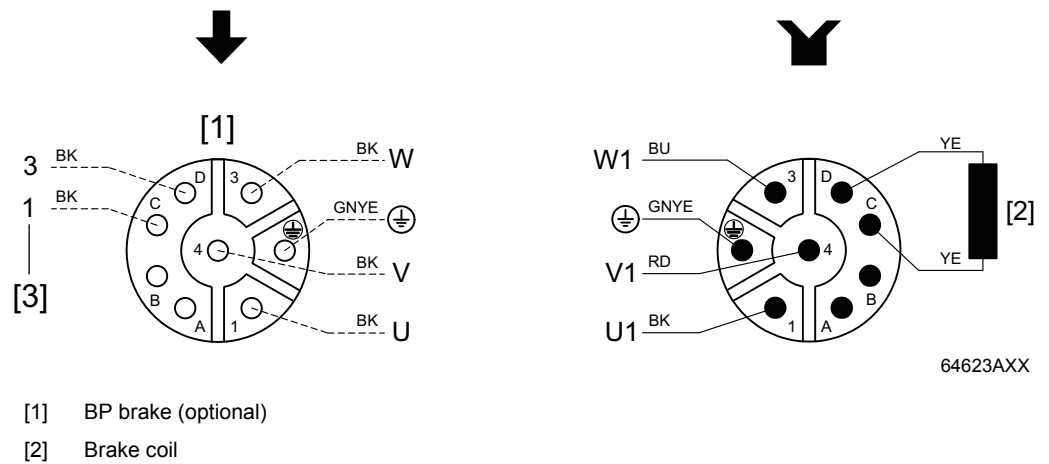
6.3.4 Wiring diagrams

Symbols used

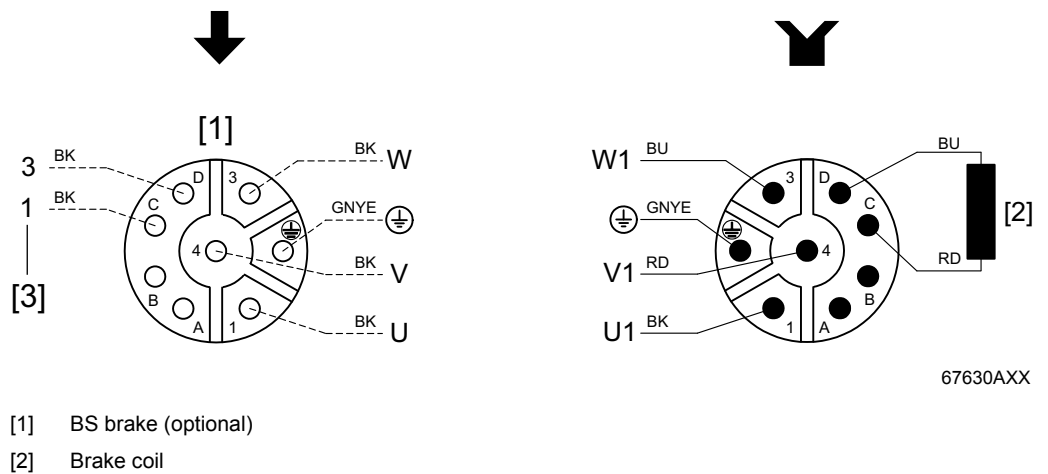
	Plug connector upper part (to be connected by the customer)
	Plug connector lower part (connected at the factory)

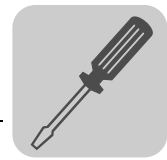
Connecting SM1 / SB1 power plug connectors

CMS50/63 wiring diagram with/without BP brake



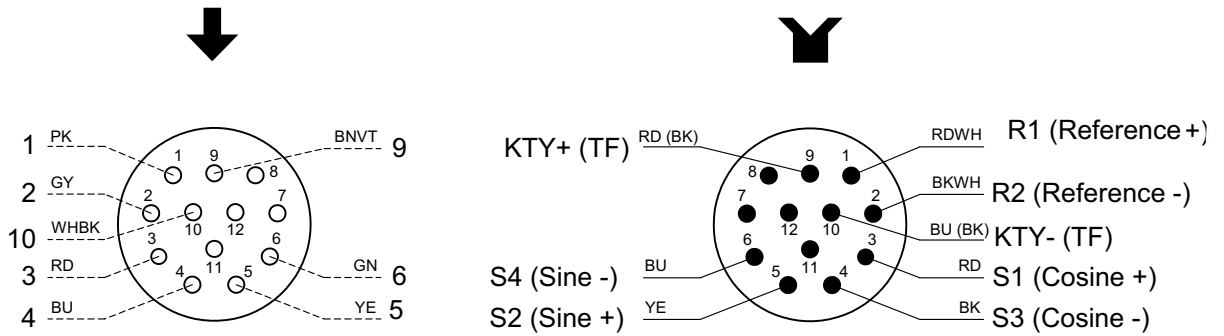
CMS71 wiring diagram with/without BS brake





RH1M resolver signal plug connector

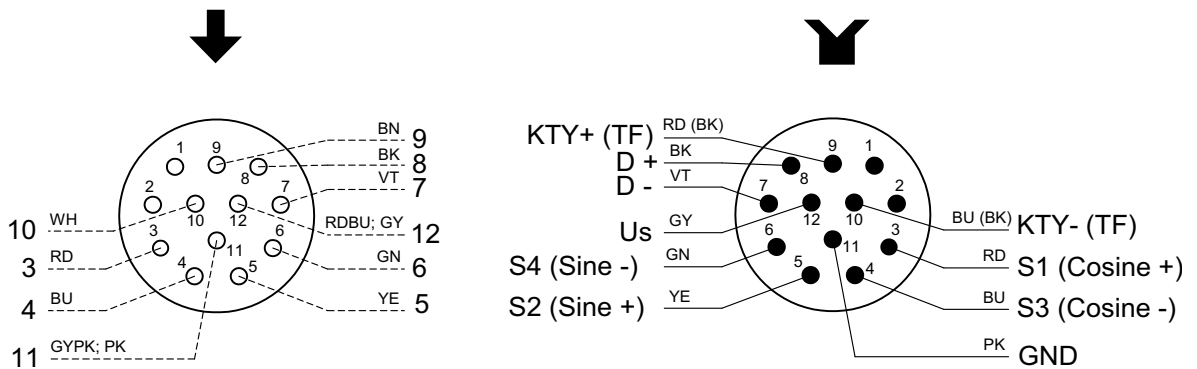
Wiring diagram



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ES1H, AS1H, AK0H, EK0H encoder signal plug connector

Wiring diagram

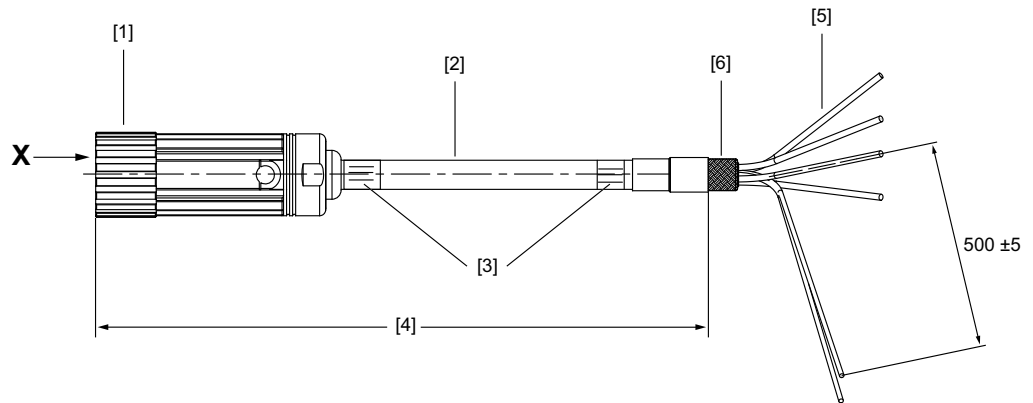


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6.4 Structure of the prefabricated cables for CMS electric cylinders

6.4.1 Motor cables/brakemotor cables



- [1] Connector: Intercontec BSTA 078
- [2] SEW-EURODRIVE logo printed on cable
- [3] Nameplate
- [4] Line length ≤ 10 m: Tolerance +200 mm
Line length ≥ 10 m: Tolerance +2%
Permitted cable length according to the technical documents
- [5] Prefabricated cable end for inverter
Required loose parts are supplied with the cable
- [6] Shielding 20 mm, pulled back approximately + 5 mm

Motor side

The power cables on the motor side consist of an 8-pin plug connector and socket contacts.

The shield is connected in the connector housing according to EMC requirements. All plug connectors seal the plug on the cable end with a lamellar seal and ensure cable relief according to EN 61884.

Prefabrication on inverter end

The individual cable cores of the motor and brakemotor cables are exposed and the shield is prepared for connection in the control cabinet. The cable for the inverter end still has to be prefabricated. The loose parts required are supplied with the cable in a separate bag.

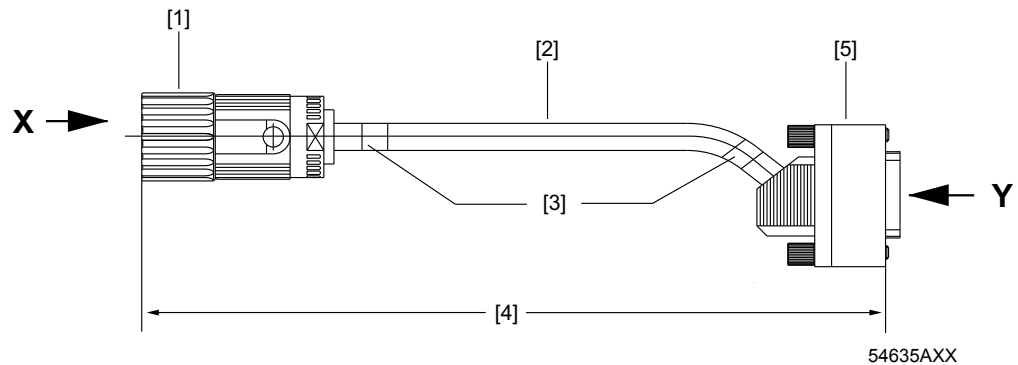
Loose parts

The following loose parts are supplied in accordance with the core cross sections for connection to the power terminals on the inverter:

Bag no.	Contents
1	4 x conductor end sleeves 1.5 mm ² , insulated 4 x M6 U-shaped cable lugs 1.5 mm ²
2	4 x conductor end sleeves 2.5 mm ² , insulated 4 x M6 U-shaped cable lugs 2.5 mm ²
3	4 x conductor end sleeves 4 mm ² , insulated 4 x M6 U-shaped cable lugs 4 mm ²



6.4.2 Feedback cable



- [1] Connector: Intercontec ASTA
- [2] Printed on connector: SEW-EURODRIVE
- [3] Nameplate
- [4] Line length ≤ 10 m: Tolerance +200 mm
Line length ≥ 10 m: Tolerance +2%
Permitted cable length according to the technical documents
- [5] D-sub plug

Motor side

A 12-pin EMC signal plug connector from Intercontec with socket contacts is used on the motor end for RH.M/AS1H/ES1H. The shield is connected in the connector housing according to EMC requirements. All plug connectors seal the plug on the cable end with a lamellar seal.

Prefabrication on inverter end

A commercial D-sub EMC connector with pin contacts is used on the inverter end. A 9-pin or 15-pin connector matching the inverter is used.

Hybrid cables

The outer cable sheath on the motor and inverter end bears a nameplate with part number and logo of the prefabricated cable manufacturer. The ordered length and permitted tolerance are interrelated as follows:

- Line length ≤ 10 m: Tolerance 200 mm
- Line length ≥ 10 m: + 2 % tolerance

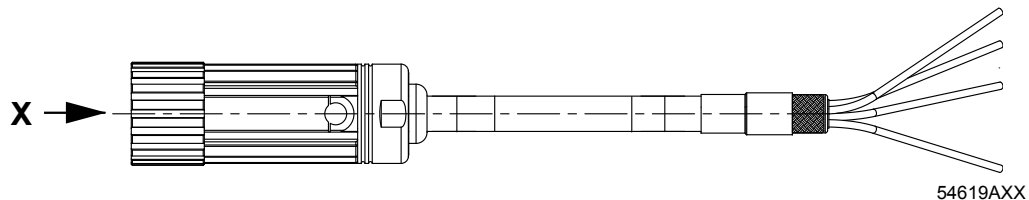
	INFORMATION
	Refer to the system manual of the inverter for determining the maximum cable length. Make sure that an EMC-compliant environment is maintained during project planning.



6.5 Power cables

6.5.1 Motor cables

CMS motor cable



CMS motor cable types

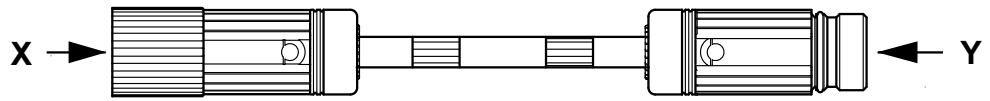
Plug connector type	Number of cores and line cross section	Part number	Installation
SM 11	4 × 1.5 mm ²	0590 4544	Fixed installation
SM 11	4 × 1.5 mm ²	0590 6245	Cable carrier installation
SM12	4 × 2.5 mm ²	0590 4552	Fixed installation
SM12	4 × 2.5 mm ²	0590 6253	Cable carrier installation
SM14	4 × 4 mm ²	0590 4560	Fixed installation
SM14	4 × 4 mm ²	0590 4803	Cable carrier installation

Pin assignment of the CMS motor cable

Plug connector view X	Pin	Cable core color	Assigned	Extra
BSTA 078 	1	(BK) Black	U	Bag of loose parts
	2	(GN/YE) Green / Yellow	PE	
	3	(BK) Black	W	
	4	(BK) Black	V	



CMS motor extension cable



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CMS motor extension cable types

Plug connector type	Number of cores and line cross section	Part number	Installation
SM11	4 × 1.5 mm ²	1333 2457	Cable carrier installation
SM12	4 × 2.5 mm ²	1333 2465	Cable carrier installation
SM14	4 × 4 mm ²	1333 2473	Cable carrier installation

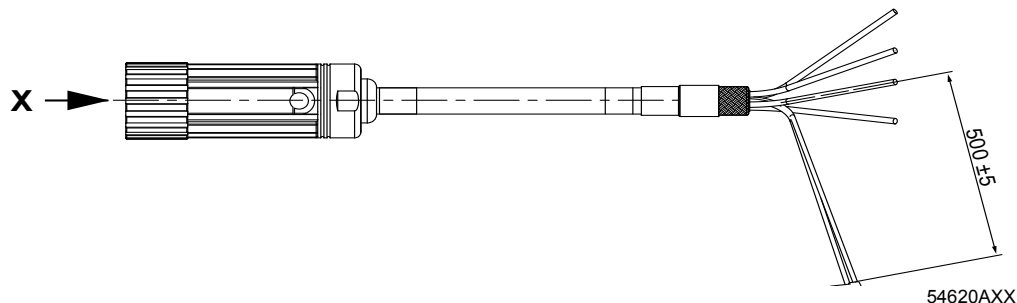
Pin assignment of CMS motor extension cable

Plug connector view X	Pin	Cable core color	Assigned	Pin	Plug connector view Y
BSTA 078 	1	(BK/WH) Black with white lettering U, V, W	U	1	BKUA 199
	4		V	4	
	3		W	3	
	2	(GR/YE) Green / Yellow	PE	2	



6.5.2 Brakemotor cable

CMS brakemotor cable



CMS brakemotor cable types

Plug connector type	Number of cores and line cross section	Part number	Installation
SB 11	$4 \times 1.5 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1335 4345	Fixed installation
SB 11	$4 \times 1.5 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1335 4388	Cable carrier installation
SB12	$4 \times 2.5 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1335 4353	Fixed installation
SB12	$4 \times 2.5 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1335 4396	Cable carrier installation
SB14	$4 \times 4 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1335 4361	Fixed installation
SB14	$4 \times 4 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1342 1603	Cable carrier installation

Pin assignment of CMS brakemotor cable

Plug connector view X	Pin	Cable core color	Assigned	Extra
	1	(BK/WH) Black with white lettering U, V, W	U	Bag of loose parts
	4		V	
	3		W	
	2	(GN/YE) Green / Yellow	PE	
	A	-	n. c.	
	B	-	2.	
	C	(BK/WH) Black with white lettering	1	
	D		3	

INFORMATION

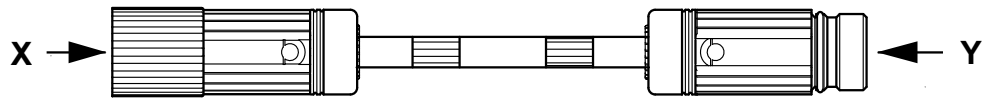


The current part numbers are derived from the previous part numbers of the DS56 motor. You can continue to use the old numbers, but note the deviating assignment of the contacts C and D.

The polarity of the connection is irrelevant for the BP brake. For the BS brake of the CMS71L, the polarity must be correct.



CMS brakemotor extension cable



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CMS brakemotor extension cable types

Plug connector type	Number of cores and line cross section	Part number	Installation
SB11	$4 \times 1.5 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1333 2481	Cable carrier installation
SM12	$4 \times 2.5 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1333 2503	Cable carrier installation
SM14	$4 \times 4 \text{ mm}^2 + 2 \times 1 \text{ mm}^2$	1333 2511	Cable carrier installation

Pin assignment of the CMS brakemotor extension cable

Plug connector view X	Pin	Cable core color	Assigned	Pin	Plug connector view Y
BSTA 078 	1	(BK/WH) Black with white lettering U, V, W	U	1	BKUA 199
	4		V	4	
	3		W	3	
	2	(GN/YE) Green / Yellow	PE	2	
	A	-	n. c.	A	
	B	-	2.	B	
	C	(BK/WH) Black with white lettering	1	C	
	D		3	D	



INFORMATION

The current part numbers are derived from the previous part numbers of the DS56 motor. You can continue to use the old numbers, but note the deviating assignment of the contacts C and D.

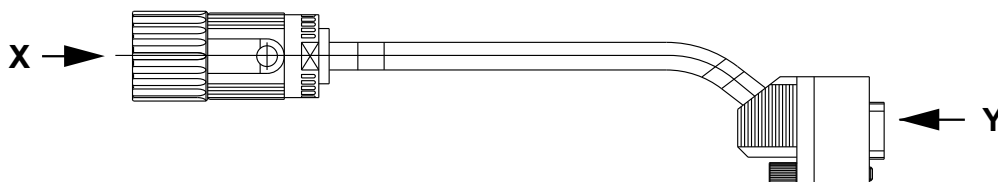
The polarity of the connection is irrelevant for the BP brake. For the BS brake of the CMS71L, the polarity must be correct.



6.6 Encoder cable

6.6.1 Resolver

Resolver cable RH.M for MOVIDRIVE® MDX60B/61B

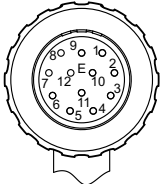
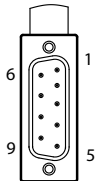


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RH.M resolver cable types for MOVIDRIVE® MDX60B/61B

Type	Number of cores and line cross section	Part number	Installation
CMS	$5 \times 2 \times 0.25 \text{ mm}^2$	0199 4875	Fixed installation
CMS	$5 \times 2 \times 0.25 \text{ mm}^2$	0199 3194	Cable carrier installation

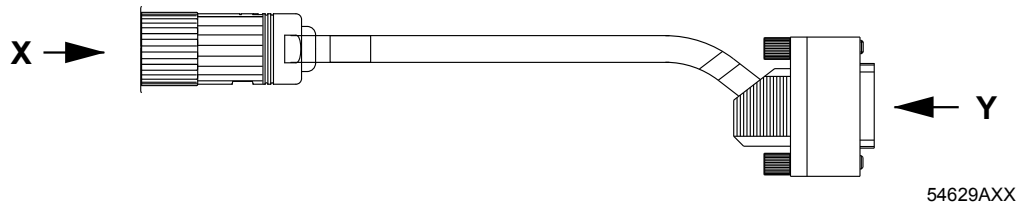
Pin assignment of resolver cable RH.M for MOVIDRIVE® MDX60B/61B

Motor connection side		Description	Cable core color	Description	MOVIDRIVE® B connection	
Plug connector view X	Pin no.				Pin no.	Plug connector view Y
ASTA 021FR 198 921 9 12-pin with socket contacts 	1	R1 (reference +)	(PK) Pink	R1 (reference +)	3	D-sub 9-pin 
	2	R2 (reference -)	(GY) Gray	R2 (reference -)	8	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	2	
	4	S3 (cosine -)	(BU) Blue	S3 (cosine -)	7	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	1	
	6	S4 (sine -)	(GN) Green	S4 (sine -)	6	
	7	n. c.	-	-	-	
	8	n. c.	-	-	-	
	9	TF/KTY +	(BN) Brown / (VT) Violet ¹⁾	TF (KTY+)	9	
	10	TF/KTY -	(WH) White / (BK) Black ¹⁾	TF/KTY -	5	
	11	n. c.	-	-	-	
	12	n. c.	-	n. c.	4	

1) Double assignment to increase cross section



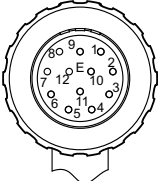
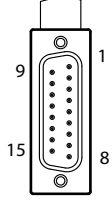
RH.M resolver cable for MOVIAXIS® MX



RH.M resolver cable tables for MOVIAXIS® MX

Type	Number of cores and line cross section	Part number	Installation
CMS	5 × 2 × 0.25 mm ²	1332 7429	Fixed installation
CMS	5 × 2 × 0.25 mm ²	1332 7437	Cable carrier installation

Pin assignment of RH.M resolver cable for MOVIAXIS® MX

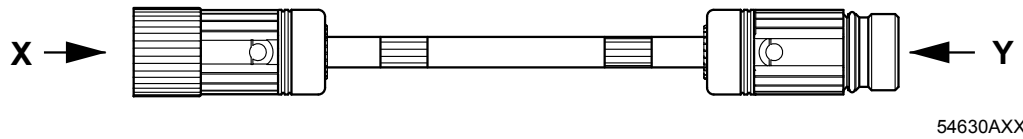
Motor connection side				Connection MOVIAXIS® MX		
Plug connector view X	Pin no.	Description	Cable core color	Description	Pin no.	Plug connector view Y
ASTA 021FR 198 921 9 12-pin with socket contacts 	1	R1 (reference +)	(PK) Pink	R1 (reference +)	5	D-sub 15-pin 
	2	R2 (reference -)	(GY) Gray	R2 (reference -)	13	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	2	
	4	S3 (cosine -)	(BU) Blue	S3 (cosine -)	10	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	1	
	6	S4 (sine -)	(GN) Green	S4 (sine -)	9	
	7	n. c.	-	n. c.	3	
	8	n. c.	-	n. c.	4	
	9	TF/KTY +	(BN) Brown / (VT) Violet ¹⁾	TF/KTY +	14	
	10	TF/KTY -	(WH) White ¹⁾	TF/KTY -	6	
	11	n. c.	-	n. c.	7	
	12	n. c.	-	n. c.	8	
	-	-	n. c.	11		
	-	-	n. c.	12		
	-	-	n. c.	15		

1) Double assignment to increase cross section

All connectors are shown with view onto the pins.



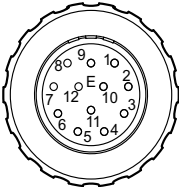
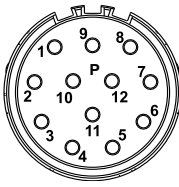
Extension cable for RH.M resolver



Extension cable types for RH.M resolver

Type	Number of cores and line cross section	Part number	Installation
CMS	$5 \times 2 \times 0.25 \text{ mm}^2$	0199 5421	Fixed installation
CMS	$5 \times 2 \times 0.25 \text{ mm}^2$	0199 5413	Cable carrier installation

Pin assignment of extension cable for resolver RH.M

Plug connector view X	Pin no.	Description	Cable core color	Description	Pin no.	Plug connector view Y
ASTA 021FR 198 673 2 12-pin with socket contacts 	1	R1 (reference +)	(PK) Pink	R1 (reference +)	1	AKUA 020MR 199 647 9 12-pin with pin contacts 
	2	R1 (reference -)	(GY) Gray	R1 (reference -)	2	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	3	
	4	S3 (cosine -)	(BU) Blue	S3 (cosine -)	4	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	5	
	6	S4 (sine -)	(GN) Green	S4 (sine -)	6	
	7	n. c.	-	n. c.	7	
	8	n. c.	-	n. c.	8	
	9	TF/KTY +	(BN) Brown / (VT) Violet ¹⁾	TF/KTY +	9	
	10	TF/KTY -	(WH) White / (BK) Black ¹⁾	TF/KTY -	10	
	11	n. c.	-	n. c.	11	
	12	n. c.	-	n. c.	12	

1) Double assignment to increase cross section

The extension cable has the same pin assignment as all other contacts.



6.6.2 HIPERFACE® encoder

HIPERFACE® encoder cable for MOVIDRIVE® B and MOVIAXIS® MX

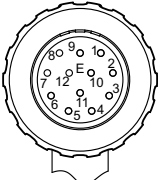
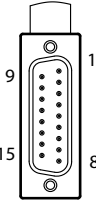


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HIPERFACE® encoder cable types for MOVIDRIVE® B and MOVIAXIS® MX

Type	Number of cores and line cross section	Part number	Installation
CMS	6 × 2 × 0.25 mm ²	1332 4535	Fixed installation
CMS	6 × 2 × 0.25 mm ²	1332 4551	Cable carrier installation

Pin assignment of HIPERFACE® cables for AK0H/AS1H/ES1H encoders

Motor connection side		MOVIAXIS® MX, MOVIDRIVE® B connection				
Plug connector view X	Pin no.	Description	Cable core color	Description	Pin no.	Plug connector view Y
ASTA 021FR 198 921 9 12-pin with socket contacts 	1	n. c.	n. c.	n. c.	3	D-sub 15-pole 
	2	n. c.	n. c.	n. c.	5	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	1	
	4	S3 (cosine -)	(BU) Blue	S3 (cosine -)	9	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	2	
	6	S4 (sine -)	(GN) Green	S4 (sine -)	10	
	7	DATA-	(VT) Violet	DATA-	12	
	8	DATA+	(BK) Black	DATA+	4	
	9	TF/KTY +	(BN) Brown	TF/KTY +	14	
	10	TF/KTY -	(WH) White	TF/KTY -	6	
	11	GND	(GY/PK) Gray/Pink ¹⁾	GND	8	
	12	U _s	(RD/BU) Red/Blue ¹⁾	U _s	15	
	-	-	n. c.	7		
	-	-	n. c.	11		
	-	-	n. c.	13		

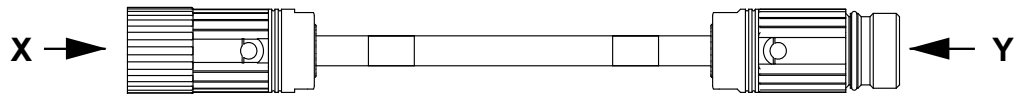
1) Double assignment to increase cross section



Electrical Installation

Encoder cable

Extension cable for HIPERFACE® AK0H/AS1H/ES1H encoders

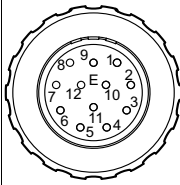
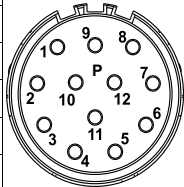


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Extension cable types for HIPERFACE® AK0H/AS1H/ES1H encoders

Type	Number of cores and line cross section	Part number	Installation
CMS	6 × 2 × 0.25 mm ²	0199 5391	Fixed installation
CMS	6 × 2 × 0.25 mm ²	0199 5405	Cable carrier installation

Pin assignment of extension cables for HIPERFACE® AK0H/AS1H/ES1H encoders

Plug connector view X	Pin no.	Description	Cable core color	Description	Pin no.	Plug connector view Y
ASTA 021FR 198 673 2 12-pin with socket contacts 	1	n. c.	-	n. c.	1	AKUA 020MR 199 647 9 12-pin with pin contacts 
	2	n. c.	-	n. c.	2	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	3	
	4	S3 (cosine -)	(BU) Blue	S3 (cosine -)	4	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	5	
	6	S4 (sine -)	(GN) Green	S4 (sine -)	6	
	7	DATA-	(VT) Violet	DATA-	7	
	8	DATA+	(BK) Black	DATA+	8	
	9	TF/KTY +	(BN) Brown	TF/KTY +	9	
	10	TF/KTY -	(WH) White	TF/KTY -	10	
	11	GND	(GY/PK) (Gray/Pink / (PK) Pink	GND	11	
	12	U _s	(RD/BU) Red/Blue / (GY) Gray	U _s	12	

The extension cable has the same pin assignment as all other contacts.



6.7 Mating connector combination

6.7.1 Power cable

Cable type		Connec- tor type	Cable cross section [mm ²]	Part number	
				Prefabricated cables	Replacement power connector*
Fixed installation	Motor cable	SM11	4 x 1.5 mm ²	0590 4544	0198 6740
		SM12	4 x 2.5 mm ²	0590 4552	0198 6740
		SM14	4 x 4 mm ²	0590 4560	0199 1639
		SM11	4 x 1.5 mm ² (SpeedTEC)	-	1335 4698
		SM12	4 x 2.5 mm ² (SpeedTEC)	-	1335 4698
		SM14	4 x 4 mm ² (SpeedTEC)	-	1335 4264
	Brakemotor cable ¹⁾	SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1335 4345	0198 6740
		SB12	4 x 2.5 mm ² + 2 x 1 mm ²	1335 4353	0198 6740
		SB14	4 x 4 mm ² + 2 x 1 mm ²	1335 4361	0199 1639
		SB11	4 x 1.5 mm ² + 2 x 1 mm ² (SpeedTec)	-	1335 4698
		SB12	4 x 2.5 mm ² + 2 x 1 mm ² (SpeedTec)	-	1335 4698
		SB14	4 x 4 mm ² + 2 x 1 mm ² (SpeedTec)	-	1335 4264
Cable carrier instal- lation	Motor cable	SM11	4 x 1.5 mm ²	0590 6245	0198 6740
		SM12	4 x 2.5 mm ²	0590 6253	0198 9197
		SM14	4 x 4 mm ²	0590 4803	0199 1639
		SM11	4 x 1.5 mm ² (SpeedTec)	-	1335 4698
		SM12	4 x 2.5 mm ² (SpeedTec)	-	1335 4256
		SM14	4 x 4 mm ² (SpeedTec)	-	1335 4264
	Brakemotor cable ¹⁾	SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1335 4388	0198 9197
		SB12	4 x 2.5 mm ² + 2 x 1 mm ²	1335 4396	0198 9197
		SB14	4 x 4 mm ² + 2 x 1 mm ²	1342 1603	0199 1639
		SB11	4 x 1.5 mm ² + 2 x 1 mm ² (SpeedTec)	-	1335 4256
		SB12	4 x 2.5 mm ² + 2 x 1 mm ² (SpeedTec)	-	1335 4256
		SM14	4 x 4 mm ² + 2 x 1 mm ² (SpeedTec)	-	1335 4264

1) BP brake: 3-core cable, only 2 cores are used

* The complete connector service pack always includes the following parts:

- Power connector
- Insulation inserts
- Socket contacts



6.7.2 Encoder cable

Cable type		Cable cross section [mm ²]	FI type	Part number	
				Prefabricated cables	Replacement power connector*
Fixed installation	Resolver cable	5 x 2 x 0.25 mm ²	MOVIDRIVE®	0199 4875	0198 6732
			MOVIAXIS®	1332 7429	
		5 x 2 x 0.25 mm ² (SpeedTec)	MOVIDRIVE®	-	1644 7115
			MOVIAXIS®	-	
Cable carrier installation		5 x 2 x 0.25 mm ²	MOVIDRIVE®	0199 3194	0198 6732
			MOVIAXIS®	1332 7437	
		5 x 2 x 0.25 mm ² (SpeedTec)	MOVIDRIVE®	-	1644 7115
			MOVIAXIS®	-	
Fixed installation	Hiperface® cable	6 x 2 x 0.25 mm ²	MOVIDRIVE® / MOVIAXIS®	1332 4535	0198 6732
		6 x 2 x 0.25 mm ² (SpeedTec)	MOVIDRIVE® / MOVIAXIS®	-	1644 7115
Cable carrier installation		6 x 2 x 0.25 mm ²	MOVIDRIVE® / MOVIAXIS®	1332 4551	0198 6732
		6 x 2 x 0.25 mm ² (SpeedTec)	MOVIDRIVE® / MOVIAXIS®	-	1644 7115

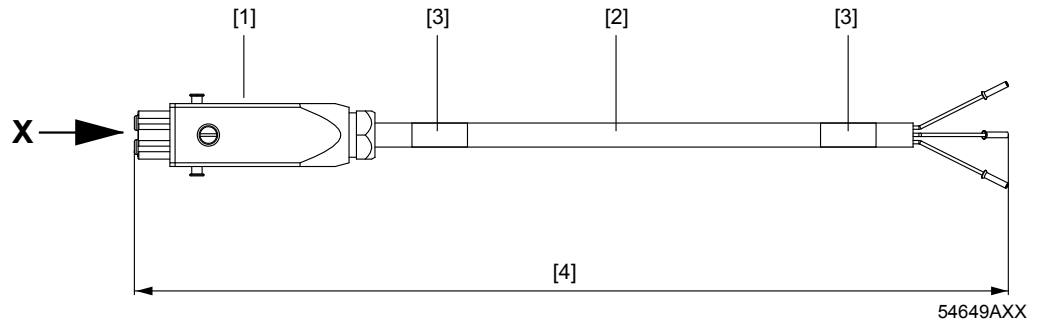
* The complete connector service pack always includes the following parts:

- Power connector
- Insulation inserts
- Socket contacts



6.8 Forced cooling fan cable

Cable for motors with VR forced cooling fan

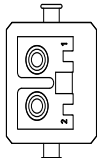


- [1] Connector: STAK 200
- [2] Printed on connector: SEW-EURODRIVE
- [3] Nameplate
- [4] Line length ≤ 5 m: Tolerance +200 mm
Line length ≥ 5 m: Tolerance +2%
Permitted cable length according to the technical documents

Cable types for motors with VR forced cooling fan

Type	Cross section	Installation	Part number
CMS	3 x 1 mm ² (AWG 18)	Fixed installation	0198 6341
CMS		Cable carrier installation	0199 560X

Pin assignment of cables for motors with VR forced cooling fan

STAK 200 plug connector view X	Pin	Core identification	Assigned	Pin	Connection type
	1	Digit 1	24 V +	Cut-off, length ca. 250 mm	Conductor end sleeves
	2	Digit 2	0 V		

Alternative connector for cable for the VR forced cooling fan

Signal plug connector with socket contacts (complete)

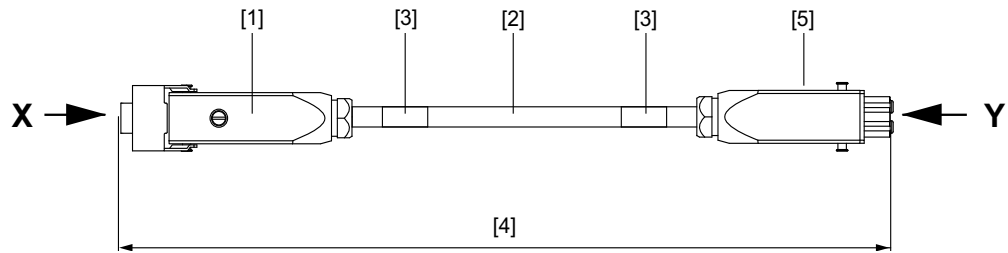
Type	Connectable cross sections	Installation	Part number
VR	3 x 1 mm ² (AWG 18)	Fixed installation/cable carrier installation	0198 4985



Electrical Installation

Forced cooling fan cable

Extension cable for motors with VR forced cooling fan



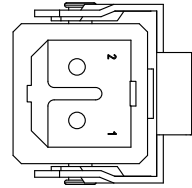
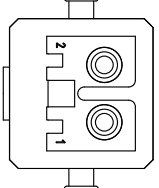
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- [1] Connector: STAS 200
- [2] Printed on connector: SEW-EURODRIVE
- [3] Nameplate
- [4] Line length ≤ 5 m: Tolerance +200 mm
Line length ≥ 5 m: Tolerance +2%
Permitted cable length according to the technical documents.
- [5] Socket: STAK 200

Extension cable types for motors with VR forced cooling fan

Type	Cross section	Installation	Part number
CMS	3 × 1 mm ² (AWG 18)	Fixed installation	0199 5618
CMS		Cable carrier installation	0199 5626

Pin assignment of extension cables for motors with VR forced cooling fan

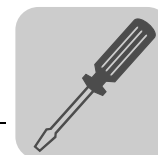
STAS 200 plug connector view X	Pin	Core identification	Assigned	Pin	STAK 200 connection type view Y
Connector with two pin contacts 	1	Digit 1	24 V +	1	Connector with two socket contacts 
	2	Digit 2	0 V	2	

The extension cable has the same pin assignment as all other contacts.

Alternative connector for cable for the VR forced cooling fan

Signal plug connector with pin contacts (complete)

Type	Connectable cross sections	Part no.
VR	3 × 1 mm ²	0198 5693



6.9 Cable specifications for CMS power cables

6.9.1 Fixed installation

Motor cable

Installation		Fixed				
Cable cross sections		4 x 1.5 mm ² (AWG 16)	4 x 2.5 mm ² (AWG 14)	4 x 4 mm ² (AWG 12)	4 x 6 mm ² (AWG 10)	4 x 10 mm ² (AWG 8)
Manufacturer		HELUKABEL				
Manufacturer designation		LI9YCY				
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C]	Fixed installation -40 to +80 (-40 to +176)				
Max. temperature	[°C]	+80				
Min. bending radius	[mm]	45	55	65	73	85
Diameter D	[mm]	9.0 ± 0.2	11 ± 0.2	13 ± 0.2	14.3 ± 0.3	17.0 ± 0.6
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange, similar to RAL 2003				
Approval(s)		DESINA / VDE / UL				
Capacitance core/shielding	[nF/km]	110	110	118	125	125
Capacitance core/core	[nF/km]	70	70	75	80	80
Halogen-free		no				
silicon-free		yes				
CFC-free		yes				
Inner insulation (core)		PP				
Outer insulation (sheath)		PVC				
Flame-inhibiting/self-extinguishing		no				
Conductor material		Cu				
Shielding		Tinned Cu				
Weight (cable)	[kg/km]	134	202	262	332	601

**Brakemotor cable**

Installation		Fixed				
Cable cross sections		4 x 1.5 mm ² (AWG 16) + 3 x 1 mm ² (AWG 18)	4 x 2.5 mm ² (AWG 14) + 3 x 1 mm ² (AWG 18)	4 x 4 mm ² (AWG 12) + 3 x 1 mm ² (AWG 18)	4 x 6 mm ² (AWG 10) + 3 x 1.5 mm ² (AWG 16)	4 x 10 mm ² (AWG 8) + 3 x 1.5 mm ² (AWG 16)
Manufacturer		HELUKABEL				
Manufacturer designation		LI9YCY				
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C]	Fixed installation: -40 to +80				
Max. temperature	[°C]	+80				
Min. bending radius	[mm]	60	68	75	85	100
Diameter D	[mm]	11.8 ± 0.4	13.4 ± 0.4	15.0 ± 0.5	17.0 ± 0.6	20.0 ± 1.0
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange similar to RAL 2003				
Approval(s)		DESINA / VDE / UL				
Capacitance core / shielding	[nF/km]	105	105	110	115	120
Capacitance core / core	[nF/km]	60	60	70	75	78
Halogen-free		no				
silicon-free		yes				
CFC-free		yes				
Inner insulation (core)		PP				
Outer insulation (sheath)		PVC				
Flame-inhibiting/self-extinguishing		yes				
Conductor material		Cu				
Shielding		Tinned Cu				
Weight (cable)	[kg/km]	229	292	393	542	938



6.9.2 Cable carrier installation

Motor cable

Installation		Cable carrier				
Cable cross sections		4 x 1.5 mm ² (AWG 16)	4 x 2.5 mm ² (AWG 14)	4 x 4 mm ² (AWG 12)	4 x 6 mm ² (AWG 10)	4 x 10 mm ² (AWG 8)
Manufacturer		Nexans				
Manufacturer designation		PSL(LC)C11Y-J 4 x - mm ²		PSL11YC11Y-J 4 x - mm ²		
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C]	-20 to +60				
Max. temperature	[°C]	+90 (on conductor)				
Min. bending radius	[mm]	134	140	135	155	180
Diameter D	[mm]	12.8 + 0.6 / -0.7	15.7 ± 0.3	13.2 ± 0.4	15.4 ± 0.4	17.8 ± 0.5
Maximum acceleration	[m/s ²]	20				
Max. velocity	[m/min]	200 at max. travel distance of 5 m				
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange similar to RAL 2003				
Approval(s)		DESINA / VDE / UL / cRUus				
Capacitance core / shielding	[nF/km]	95	95	170	170	170
Capacitance core / core	[nF/km]	65	65	95	95	95
Halogen-free		yes				
silicon-free		yes				
CFC-free		yes				
Inner insulation (core)		Polyolefin		TPM		
Outer insulation (sheath)		TPU (PUR)				
Flame-inhibiting/self-extinguishing		yes				
Conductor material		E-Cu blank				
Shielding		Braided tinned Cu shield (optically covered > 85 %)				
Weight (cable)	[kg/km]	249	373	311	426	644
Min. bending cycles		≥ 5 million				


**Brakemotor cable**

Installation		Cable carrier				
Cable cross sections		4 x 1.5 mm ² (AWG 16) + 3 x 1 mm ² (AWG 18)	4 x 2.5 mm ² (AWG 14) + 3 x 1 mm ² (AWG 18)	4 x 4 mm ² (AWG 12) + 3 x 1 mm ² (AWG 18)	4 x 6 mm ² (AWG 10) + 3 x 1.5 mm ² (AWG 16)	4 x 10 mm ² (AWG 8) + 3 x 1.5 mm ² (AWG 16)
Manufacturer		Nexans				
Manufacturer designation		PSL(LC)C11Y-J 4x... +3A.../C		PSL11YC11Y-J 4x... +3A.../C		
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C]	-20 to +60				
Max. temperature	[°C]	+90 (conductor)				
Min. bending radius	[mm]	159	170	155	175	200
Diameter D	[mm]	15.0 ± 0.9	16.5 ± 0.7	15.3 ± 0.5	17.4 ± 0.5	20.5 ± 0.5
Maximum acceleration	[m/s ²]	20				
Max. velocity	[m/min]	200 at max. travel distance of 5 m				
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange similar to RAL 2003				
Approval(s)		DESINA / VDE / UL / cRUus				
Capacitance core/shielding	[nF/km]	105	105	170	170	170
Capacitance core/core	[nF/km]	65	65	95	95	95
Halogen-free		yes				
silicon-free		yes				
CFC-free		yes				
Inner insulation (cable)		TPM				
Outer insulation (sheath)		Polyolefin		TPU (PUR)		
Flame-inhibiting / self-extinguishing		yes				
Conductor material		E-Cu blank				
Shielding		Braided tinned Cu shield (optically covered > 85 %)				
Weight (cable)	[kg/km]	335	433	396	522	730
Min. bending cycles		= 5 million				



6.10 Cable specifications for encoder cables

6.10.1 Fixed installation of feedback cables


Accessory designation		AS1H / ES1H / AK0H	RH.M
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²
Manufacturer		HELUKABEL	
Manufacturer designation		LI9YCY	
Operating voltage V ₀ / V AC	[V]	230 / 350	
Temperature range	[°C]	Fixed installation -40 to +80	
Max. temperature	[°C]	+ 80	
Min. bending radius	[mm]	43	36.5
Diameter D	[mm]	8.6 ± 0,2	7.3 ± 0,2
Core identification		DIN 47 100	
Sheath color		Green, similar to RAL 6018	
Approval(s)		DESINA / VDE /  US	
Capacitance core/shielding	[nF/km]	110	
Capacitance core/core	[nF/km]	70	
Halogen-free		no	
Silicone-free		yes	
CFC-free		yes	
Inner insulation (core)		PP	
Outer insulation (sheath)		PVC	
Flame-inhibiting/self-extinguishing		no	
Conductor material		Cu blank	
Shielding		Braided tinned Cu	
Weight (cable)	[kg/km]	107	78



Electrical Installation

Cable specifications for encoder cables

6.10.2 Cable carrier installation of feedback cables

Accessory designation		AS1H / ES1H / AK0H	RH.M
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²
Manufacturer		Nexans	
Manufacturer designation		SSL18YC11Y 6 x 2 x 0.25/ SSL11YC11Y 5 x 2 x 0.25	
Operating voltage V ₀ / V AC	[V]	300	
Temperature range	[°C]	-20 to + 60	
Max. temperature	[°C]	+90 (on conductor)	
Min. bending radius	[mm]	100	95
Diameter D	[mm]	9.8 ± 0.2	9,5 ± 0.2
Maximum acceleration	[m/s ²]	20	
Max. velocity	[m/min]	200	
Core identification		WH/BN, GN/YE, GY/PK, BU/RD, BK/VT, GY-PK/RD-BU	WH/BN, GN/YE, GY/PK, BU/RD, BK/VT
Sheath color		Green similar to RAL 6018	
Approval(s)		DESINA / VDE /  US	
Capacitance core/shielding	[nF/km]	100	
Capacitance core/core	[nF/km]	55	
Halogen-free		yes	
Silicone-free		yes	
CFC-free		yes	
Inner insulation (core)		PP	
Outer insulation (sheath)		TPE-U	
Flame-inhibiting/self-extinguishing		yes	
Conductor material		E-Cu blank	
Shielding		Braided tinned Cu	
Weight	[kg/km]	130	120
Min. bending cycles		≥ 5 million	



6.11 Cable specification of forced cooling fan cables for CMS motors

6.11.1 Fixed installation of the forced cooling fan cable

Accessory designation		VR
Cable cross sections		3 x 1 mm ²
Manufacturer		Lapp
Manufacturer designation		Ölflex 110 Classic
Operating voltage V ₀ / V AC	[V]	300 / 500
Temperature range	[°C]	-30 to +70
Max. temperature	[°C]	+ 70
Min. bending radius	[mm]	24
Diameter D	[mm]	6.0 ± 0.3
Core identification		VDE 0293
Sheath color		Silver gray, RAL 7001
Approval(s)		VDE
Capacitance core/shielding	[nF/km]	-
Capacitance core/core	[nF/km]	-
Halogen-free		no
Silicone-free		yes
CFC-free		yes
Inner insulation (core)		PVC
Outer insulation (sheath)		PVC
Flame-inhibiting/self-extinguishing		no
Conductor material		Cu blank
Shielding		-
Weight (cable)	[kg/km]	65



Electrical Installation

Cable specification of forced cooling fan cables for CMS motors

6.11.2 Cable carrier installation for forced cooling fan cable

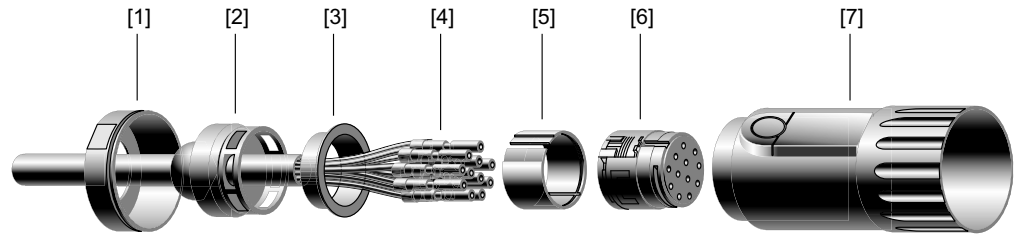
Accessory designation		VR
Cable cross sections		3 x 1 mm²
Manufacturer		Nexans
Manufacturer designation		PSL 3 x 1.0
Operating voltage V_0 / V AC	[V]	300
Temperature range	[°C]	-30 to +70
Max. temperature	[°C]	+ 90 (on conductor)
Min. bending radius	[mm]	45
Diameter D	[mm]	5,7 ± 0.2
Maximum acceleration	[m/s ²]	10
Max. velocity	[m/min]	50
Core identification		2 x WH with digit + 1 x GN/YE
Sheath color		Black RAL 9005
Approval(s)		VDE / UL
Capacitance core/shielding	[nF/km]	-
Capacitance core/core	[nF/km]	-
Halogen-free		yes
Silicone-free		yes
CFC-free		yes
Inner insulation (core)		TPM
Outer insulation (sheath)		TPE-U
Flame-inhibiting/self-extinguishing		yes
Conductor material		E-Cu blank
Shielding		-
Weight	[kg/km]	50
Min. bending cycles		≥ 5 million



6.12 Assembly of plug connectors for resolver/HIPERFACE®

6.12.1 Scope of delivery for plug connectors

The following parts are supplied for assembling resolver/HIPERFACE® plug connectors. The SEW part number is 198 673 2.



54715AXX

- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing



INFORMATION

Hold the cable firmly in place when tightening the cable and connector.



6.12.2 Assembly notes for plug connectors

1		<ul style="list-style-type: none"> • Pull the screw fitting and seal with strain relief 31 mm over the cable.
2		<ul style="list-style-type: none"> • Strip 28 mm of cable insulation off the end of the cable
3		<ul style="list-style-type: none"> • Fold back the braid shield and fan it out
4		<ul style="list-style-type: none"> • Strip 6 mm insulation off the leads • Push the socket contacts onto the ends of the leads
5		<ul style="list-style-type: none"> • Insert the small-diameter positioning tool (SEW part number 019 244 9) into the crimping tool until the green mark appears in the view window [A]. • Set the press thickness [B] to 24 on the crimping tool.
6		<ul style="list-style-type: none"> • Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. • Repeat this procedure for each lead.
7		<ul style="list-style-type: none"> • Pull the shield over the leads and press it against the seal.



8		<ul style="list-style-type: none"> • Turn the shield ring until the braid shield is flush with the shield ring.
9		<ul style="list-style-type: none"> • Pull the insulator apart evenly by about 1 mm.
10		<ul style="list-style-type: none"> • Insert the socket contacts into the insulator.
11		<ul style="list-style-type: none"> • Press the insulator together until you hear a "click."
12		<ul style="list-style-type: none"> • Fold open the insulating sleeve. • Position the side of the insulating sleeve with the recess against the groove in the insulator so that the opening of the insulating sleeve is pointing in the same direction as the double-headed arrow on the insulator. • Press the insulating sleeve together until it engages. • Insert the insulator into the connector housing in the middle position.
13		<ul style="list-style-type: none"> • Fix the connector housing with a wrench and use a second wrench to tighten the screw fitting. • [A] = Fix in place

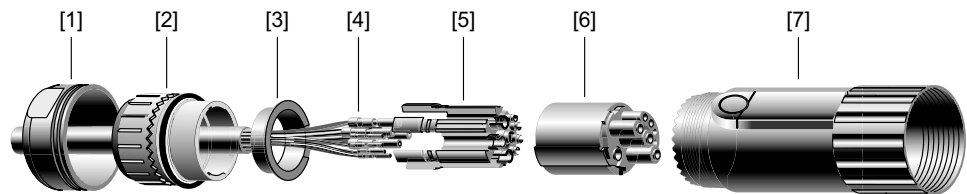


6.13 Power connector assembly

The following assembly figure and description are exemplary for the SM / SB power plug connectors. This description can be used analogously for assembling the SMB and SMC power plug connectors.

6.13.1 Scope of delivery of SM. / SB. power plug connectors

The following parts are supplied for assembling the power plug connectors. The SEW part number is 198 674 0.



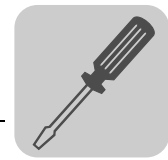
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- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing



INFORMATION

Hold the cable firmly in place when tightening the cable and the connector.



6.13.2 Assembly notes for SM1/SB1 power connectors

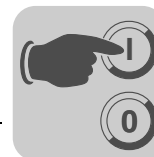
1		<ul style="list-style-type: none"> Pull the screw fitting and the seal with strain relief over the cable. 															
2		<ul style="list-style-type: none"> Strip 44 mm of cable insulation off the end of the cable. 															
3		<ul style="list-style-type: none"> Fold back the braided shield and fan it out. 															
4		<ul style="list-style-type: none"> Shorten the power leads (U, V, W) to 37 mm. Shorten the PE lead (GN/YE) to 38 mm. Do not shorten leads 1, 2, 3. 															
5		<ul style="list-style-type: none"> Pull the shield over the leads. Strip 7 mm of insulation off leads U, V, P and PE. Strip 5 mm of insulation off the leads 1, 2, 3. 															
6		<ul style="list-style-type: none"> Insert the positioning tool in the crimping tool until the marking (color) appears in the view window [A] appears (see table below). Set the press thickness [B] on the crimping tool according to the table. <table border="1" data-bbox="710 1653 1441 1832"> <thead> <tr> <th>Litz wire</th> <th>a [mm²]</th> <th>Positioning tool Part number</th> <th>Marking (color)</th> <th>Press force</th> </tr> </thead> <tbody> <tr> <td>1, 2, 3</td> <td>0.14 - 1.0</td> <td>019 244 9</td> <td>Green (GN)</td> <td>24</td> </tr> <tr> <td>U, V, W and PE</td> <td>0.35 - 4.0</td> <td>019 245 7</td> <td>Blue (BU)</td> <td>6</td> </tr> </tbody> </table>	Litz wire	a [mm ²]	Positioning tool Part number	Marking (color)	Press force	1, 2, 3	0.14 - 1.0	019 244 9	Green (GN)	24	U, V, W and PE	0.35 - 4.0	019 245 7	Blue (BU)	6
Litz wire	a [mm ²]	Positioning tool Part number	Marking (color)	Press force													
1, 2, 3	0.14 - 1.0	019 244 9	Green (GN)	24													
U, V, W and PE	0.35 - 4.0	019 245 7	Blue (BU)	6													
7		<ul style="list-style-type: none"> Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. Repeat this procedure for each lead in accordance with the table in step 6. 															



Electrical Installation



Power connector assembly


8		<ul style="list-style-type: none"> • Open the insulating sleeve.
9		<ul style="list-style-type: none"> • Insert the middle socket contact into the insulator as shown in the wiring diagram in section 5.3.4. • Close the insulating sleeve until it clicks shut. • Insert the remaining socket contacts into the insulator as shown in the wiring diagram in section 5.3.4.
10		<ul style="list-style-type: none"> • Shorten the braided shield as shown. • Insert the shield ring into the seal so that the shield and end of the cable are flush. Make sure that the braid shield is routed cleanly between the shield ring and the seal.
11		<ul style="list-style-type: none"> • Insert the insulator into the connector housing until the seal rests against its stop in the connector housing.
12		<ul style="list-style-type: none"> • Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. • [A] = Fix in place




7 Startup

7.1 Prerequisites for startup

	 DANGER
	<p>Danger of electric shock.</p> <p>Severe or fatal injuries!</p> <ul style="list-style-type: none"> • Observe the safety notes in chapter 2 during installation. • Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake. • When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer. • It is essential to observe the operating instructions supplied with the servo inverter.

	INFORMATION
	<p>The rated speed (n_N) of the motor can be higher than the mechanically permitted speed (n_{epk}).</p> <p>Limit the maximum speed at the servo inverter. For information on the procedure, refer to the documentation of the servo inverter.</p>

	INFORMATION
	<p>With the electric cylinders CMS50M, 63M and 71L, the maximum limit torque (M_{pk}) and the maximum current (I_{max}) may not be exceeded, not even for acceleration.</p> <p>Limit the maximum current at the servo inverter.</p>



7.1.1 Before startup

- The spindle must be secured against turning (→ Installing the CMS71L electric cylinder in the application); if it is not secured, the bellows will be destroyed.
- The drive must be undamaged and not blocked.
- All connections must be established correctly.
- The direction of rotation of the electric cylinder must be correct. Note the spindle position and direction of rotation of the electric cylinder.
- All protective covers have to be fitted correctly.
- All motor protection devices must be active.
- The brake must work perfectly in hoist applications.
- There must be no other sources of danger present.
- The motor must run correctly (no overload, no speed fluctuation, no loud noises, etc.).
- The braking torque must be set according to the specific application (→ section 'Technical Data', see page 23).
- In case of problems (→ Sec. "Malfunctions" page 99)



INFORMATION

For the lubricator option, note the information on page 107.



8 Malfunions

	WARNING
	<p>The electric cylinder can have a surface temperature of more than 65 °C during operation.</p> <p>Risk of burns and fire.</p> <ul style="list-style-type: none"> • Never touch the electric cylinder during operation or in the cool down phase once the it has been switched off.

	NOTICE
	<p>Improper troubleshooting may result in damages to the electric cylinder.</p> <p>Possible damage to property</p> <ul style="list-style-type: none"> • Note the following information.

- Components may be subject to mechanical loads. Support and secure the customer structure before removing the electric cylinder.
- De-energize the electric cylinder and brake before you start working on the unit. Secure the electric cylinder against unintended power-up.
- Use only genuine spare parts in accordance with the valid parts list.
- Strictly observe the safety notes in the individual chapters.

8.1 Malfunions of the electric cylinder

Malfunion	Possible cause	Remedy
Electric cylinder does not start	Supply cable interrupted	Check connections, correct if necessary
	Fuse has blown	Replace fuse
	Motor protection has triggered	Check motor protection for correct setting, correct fault if necessary
	Servo inverter faulty, overloaded, incorrectly wired or incorrectly set	Check servo inverter, check wiring
Incorrect direction of rotation	Electric cylinder connected incorrectly	Check servo inverter, check setpoints
Electric cylinder hums and has high current consumption	Drive is blocked	Check drive
	Brake does not release	→ Sec. "Brake problems"
	Encoder cable malfunction	Check encoder cable
Electric cylinder heats up excessively (measure temperature)	Overload	Measure power, use larger motor or reduce load if necessary
	Insufficient cooling	Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary
	Ambient temperature is too high	Comply with permitted temperature range
	Nominal operation type (S1 to S10, DIN 57530) exceeded, e.g. through excessive starting frequency	Adjust the rated operating mode of the motor to the required operating conditions; consult a professional to determine the correct drive if necessary
Running noise on motor	Bearing damage	Contact SEW-EURODRIVE customer service



8.2 Malfunctions of the servo inverter

	INFORMATION
	<p>The symptoms described in chapter 8.1 may also occur when the servomotor is operated with a servo inverter. Refer to the servo inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems.</p>

Please have the following information to hand if you require the assistance of our customer service:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- Digital photo if possible

8.3 Malfunctions of the brake

Malfunction	Possible cause	Remedy
Brake does not release	Incorrect operating voltage on the brake	<ul style="list-style-type: none"> • Apply correct voltage • Reversed polarity, only for BS2 brake
	Max. permitted working air gap exceeded because brake lining worn down.	Contact SEW-EURODRIVE customer service
	Voltage drop on supply cable > 10%	Ensure correct connection voltage; check cable cross section
	Brake coil has interturn short circuit or a short circuit to frame	Contact SEW-EURODRIVE customer service
Motor does not brake	Brake lining worn	Contact SEW-EURODRIVE customer service
	Incorrect braking torque.	
Brake worn	Brake release times incorrect	Adjust brake release times to startup and deceleration processes



9 Inspection and Maintenance

	WARNING
	<p>The electric cylinder can have a surface temperature of more than 65 °C during operation.</p> <p>Danger of burns.</p> <ul style="list-style-type: none"> • Never touch the electric cylinder during operation or in the cool down phase once the it has been switched off.

	NOTICE
	<p>Improper inspection/maintenance may result in damages to the electric cylinder.</p> <p>Possible damage to property.</p> <ul style="list-style-type: none"> • Note the following information.

- Strictly observe the safety notes in the individual chapters.
- Components may be subject to mechanical loads. Before removing the electric cylinder, ensure that the structure provided by the customer is supported and secured.
- Before starting work, isolate the electric cylinder and brake from the power supply. Secure the electric cylinder against unintended power-up.
- Use only genuine spare parts in accordance with the valid parts list.

9.1 General maintenance work

The electric cylinder is maintenance-free except for the threaded spindles. Replace defective parts, if possible.

Remove any traces of dirt, chips, dust, etc. from the bellows (only CMS71L) with a soft cloth.

Note that mobile cables are subject to wear. They have to be checked for external changes on a regular basis.

9.2 Lubrication of screw drive

There may be a loss of lubricant between the nut and spindle in threaded spindles. Lubricants also decrease in quality and effectiveness with age and wear. This means lubrication is required at regular intervals.

Lubrication for screw drives has to be specified accurately in terms of type, quantity and relubrication intervals. These factors are dependent on:

- Load
- Velocity
- Cyclic duration factor
- Type of screw drive (recirculating ball screw or planetary roller screw drive)
- Ambient temperature
- Pollution degree caused by dust, humidity, etc.



Inspection and Maintenance

Lubrication of screw drive



INFORMATION


The following information is intended as recommendation. It is not intended to replace individual project planning for every application.

Permanent relubrication (e.g. through connection to the lubrication system, starting on page 107) is basically the preferred solution over relubrication at certain intervals.

Relubrication at intervals is especially not recommended for planetary roller screws, which can require about 2.5 times more lubricant than recirculating ball screws.

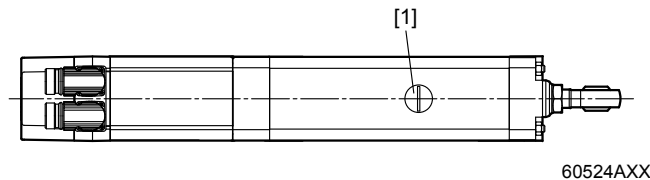


9.2.1 General information

	INFORMATION
	<p>The lubricating grease discharged into the electric cylinder accumulates in the inside of the drive. Used lubricant must be removed from the inside of the motor after five years at the latest.</p> <p>Service work must be performed by SEW employees only. During service work, the spindle must be removed from the unit and the old lubricant removed from the spindle's surface.</p>

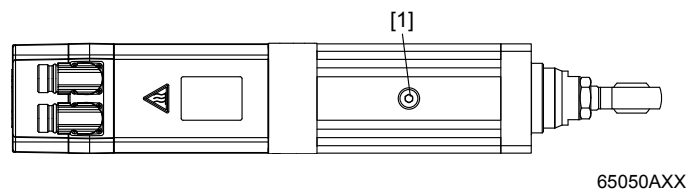
9.2.2 Size CMS50S/M

A taper greasing nipple DIN 71412 [1] for manual relubrication with a grease gun is installed as standard on the spindle nut in the inside of the motor. You can access the greasing nipple by way of screw plugs [1]; slowly move the drive until the lubricant position is visible (see section 5.4).



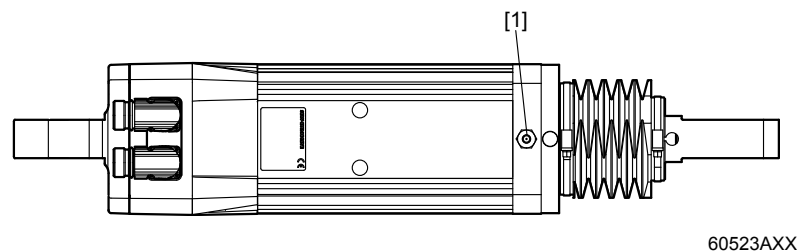
9.2.3 Size CMS63S/M

The CMS63 is equipped with oil bath lubrication that requires very little maintenance. Oil level check, filling and draining via screw plug [1].



9.2.4 Size CMS71L/M

A taper greasing nipple DIN 71412 [1] for manual relubrication with a grease gun is installed as standard on the motor.





Inspection and Maintenance

Lubricant for recirculating ball screws and planetary roller screw drives

9.3 Lubricant for recirculating ball screws and planetary roller screw drives

CMS electric cylinders are filled with the lubricant Fuchs RENOLIT CX-TOM15 as standard at the plant, and are used for recirculating ball screws and planetary roller screws.



INFORMATION

Only relubricate electric cylinders with the following lubricant:
Fuchs RENOLIT CX-TOM15

The lubricating grease Renolit CX-TOM15 of the company Fuchs can be ordered from SEW in a 400 g cartridge (DIN 1284) under **part no. 03207196**.



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The cartridge is suitable for grease guns in line with DIN 1283 with adapter piece for DIN 71412 taper grease nipples.



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9.4 Relubrication interval

	<p>STOP</p> <ul style="list-style-type: none"> • The drive must generally be relubricated once a year. • The following information only applies to the application examples described. • Always use the appropriate amount of lubricant for the individual application. • If insufficient lubricant is applied, the lubricant film is disrupted and the service life thereby reduced. • Excessive lubrication increases friction and results in heat generation. • When relubricating the drive, always pay attention to cleanliness. • There should be no dirt in the lubricant. • Wipe the greasing nipple with a cloth before applying the grease gun. • Make sure there is no trapped air in the lubricant or lubricant supply lines.
---	---

9.4.1 CMS50S with ball screw (KGT):

Example	CMS50S, 5 mm/spindle pitch revolution <ul style="list-style-type: none"> • 0.15 m travel distance • Mean traveling velocity 0.15 m/s • 1300 N load
----------------	---

Relubrication	Relubrication quantity 1 cm ³ <ul style="list-style-type: none"> • After a travel distance of 200 km or <ul style="list-style-type: none"> • 20 million revolutions of the threaded spindle nut
----------------------	--

9.4.2 CMS71L with ball screw (KGT):

Example	CMS71L, 10 mm/spindle pitch revolution <ul style="list-style-type: none"> • 0.2 m travel distance • Mean traveling velocity 0.2 m/s • 4000 N load
----------------	--

Permanent relubrication	$0.8 \text{ cm}^3/100 \text{ km} = 0.008 \text{ cm}^3/1 \text{ km}$
--------------------------------	---

Relubrication intervals	Relubrication quantity 2 cm ³ <ul style="list-style-type: none"> • After a travel distance of 250 km or <ul style="list-style-type: none"> • 25 million revolutions of the threaded spindle nut
--------------------------------	--



Inspection and Maintenance

Sizes CMS50 and CMS71 with grease lubrication

9.4.3 CMS71L with planetary roller screw drive (PGT):

- Example** CMS71L, 5 mm/spindle pitch revolution
- 0.2 m travel distance
 - Mean traveling velocity 0.2 m/s
 - 4000 N load

Permanent relubrication $2 \text{ cm}^3/100 \text{ km} = 0.02 \text{ cm}^3/1 \text{ km}$

- Relubrication interval (not recommended)** Relubrication quantity 2.5 cm^3
- After a travel distance of 50 km
- or
- 10 million revolutions of the threaded spindle

9.5 Sizes CMS50 and CMS71 with grease lubrication

9.5.1 Replacement interval of wearing parts

The drive reaches the end of its service life after 10,000 hours of nominal operation. A general overhaul and refit of the drive is not recommended.

Replacement intervals of the components	
Threaded spindle	Not necessary
A- and B-end bearing	Not necessary
Oil seals	After half of the service life (5000 hours) ¹⁾
Plain bearing bush	Customer ¹⁾
Bellows	After half of the service life (5000 hours) ¹⁾

1) For CMS71L only

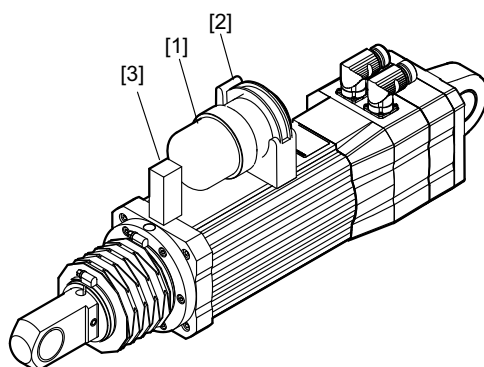


9.6 Lubricator only for size CMS71L

On request, the electric cylinder size CMS71L can be equipped with a lubricator. The threaded spindle nut is relubricated continuously with this option.

The lubricator comprises a drive unit with an electric motor, which is supplied with power either with a set of batteries (Vario lubrication system) or with 24 V and function monitoring (Control lubrication system). This motor drains the lubricant container [1] via a piston. The Control lubrication system is connected to a customer control device via a cable (length 5 m, included in scope of delivery).

The threaded elbow joints [3] are mounted, filled with lubricant and vented at the production plant.



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- [1] Lubricant container
- [2] Retaining clip
- [3] Threaded elbow joint



INFORMATION

The time between lubrications is set to one year at the production plant and is sufficient for normal applications.

For cases with high annual operating time, e.g. 24 operating hours per day, consult SEW-EURODRIVE.



9.6.1 Lubricator variants

Star Vario (SV)

The Star Vario lubricator is powered by batteries, independent of the operating status of the electric cylinder. When the electric cylinder is started up, the Star Vario lubricator must be activated separately. Activate the lubricator by turning the rotary switch to the **ON** position. After activation, the lubricator **continuously** supplies the set lubricant quantity.

Star Vario divides the content of the lubricant container into several smaller dispensing cycles within the operating period. The factory setting of the lubricator is to dispense a **volume of 60 cm³** over a **period of 12 months**.

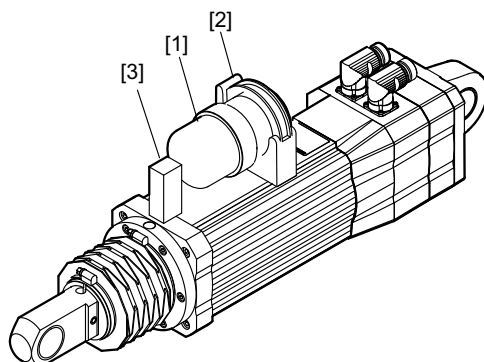
Star Control Time (ST)

The Star Control Time lubricator is connected to the voltage supply or controller via cable. The lubricator **continuously** supplies the set lubricant quantity when the **supply voltage (24 V) is connected**. The status (function, fill level) of the lubricator can be monitored via the controller.

Star Control Time divides the content of the lubricant container into several smaller dispensing cycles within the operating period. The factory setting of the lubricator is to dispense a **volume of 0.69 cm³** over a **period of 100 operating hours**.

Star Control Impulse (SI)

The Star Control Impulse lubricator is connected to the voltage supply or controller via cable. The lubricator dispenses the set lubricant quantity **in one amount** when the **supply voltage (24 V) is connected**. To dispense another amount of lubricant, the **voltage must be interrupted and connected again**. The status (function, fill level) of the lubricator can be monitored via the controller. The factory setting of the lubricator is to dispense a **volume of 0.26 cm³** per impulse.



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- [1] Lubricant container
- [2] Retaining clip
- [3] Threaded elbow joint

9.6.2 Wearing parts can be ordered from Perma

The lubricant container [1] and the battery set (only for Vario) are wearing parts and must be replaced after a year.

The parts can be ordered directly from Perma using the following part numbers:

Designation	Part no.
Star lubricant container LC unit S60 Renolit CX-TOM15	16.01085.385
Battery set (Vario)	21.000.000
Cable, 5 m (Control)	26.004.001

These parts cannot be ordered directly from SEW-EURODRIVE.

9.6.3 Retrofit set from SEW-EURODRIVE

Complete lubrication systems can be ordered from SEW-EURODRIVE for retrofitting. The retrofit set consists of parts [1, 2] with the following part numbers:

Designation	Part no.
Retrofit set lubricator cpl. Vario (SV)	1333 281 3
Retrofit set lubricator cpl. Control Time (ST)	1333 319 4
Retrofit set lubricator cpl. Control Impulse (SI)	1652 097 1

In addition, the following threaded elbow joint 1333 3178 [3] has to be ordered from SEW-EURODRIVE as it is **not included in the retrofit set**.

	STOP
	When retrofitting, you must vent the threaded elbow joint [1].



9.7 Installation and startup of Star Vario/Star Control lubricators

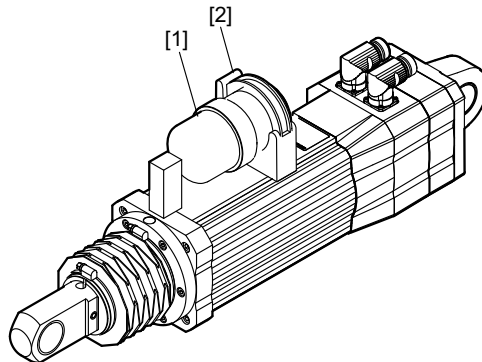
9.7.1 Assembly kit for lubricator

Assembly kit for lubricator

- Star Vario (SV) cpl. SEW part number 13332813
- Star Control Time (ST) cpl. SEW part number 13333194
- Star Control Impulse (SI) cpl. SEW part number 16520971

consists of the following individual components:

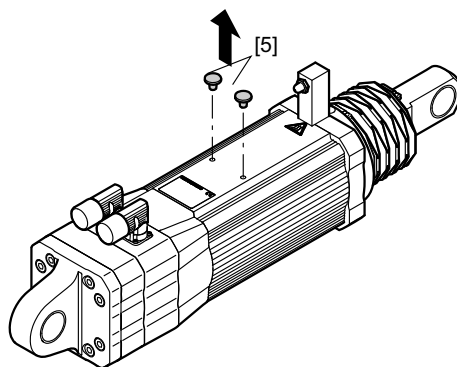
- 1 x Star Vario lubricator [1]
- or Star Control lubricator [1]
- 1 x clamp [2]
- 2 x machine screw M6x16



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9.7.2 Assembly procedure

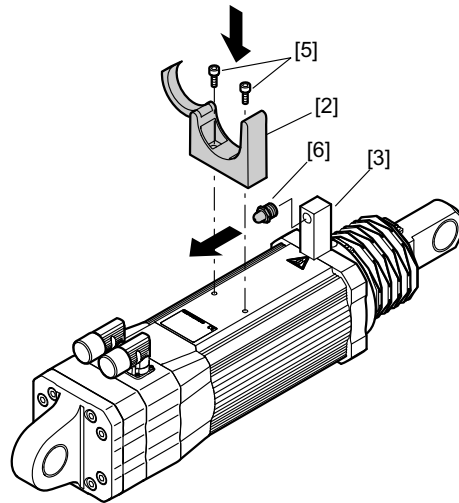
1. Remove the closing plug [5] from the motor housing.



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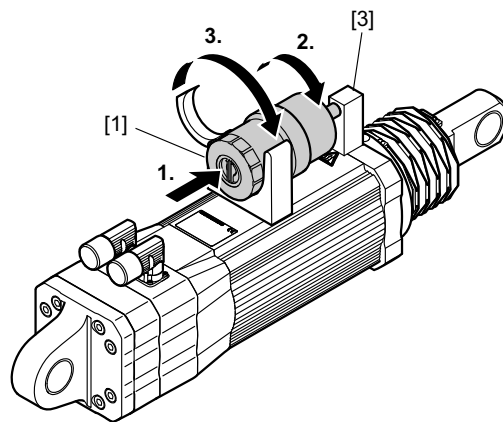


2. Mount the clamp [2] to the motor housing using 2 M6 machine screws [5]. Remove the greasing nipple [6] from the attached threaded elbow joint [3] and remove the closing plug from the lubricator.



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3. Place the lubricator [1] into the clamp and twist the lubricator into the threaded elbow joint [3]. Tighten the lubricator manually.



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4. Close the clamp by locking the top clamp arm into place.
5. For Star Control, connect the cables to the voltage supply and the controller.



Inspection and Maintenance

Installation and startup of Star Vario/Star Control lubricators

9.7.3 Retrofitting the lubricator

This requires the threaded elbow joint [3] (SEW part number: 13333178), see following figure.



INFORMATION

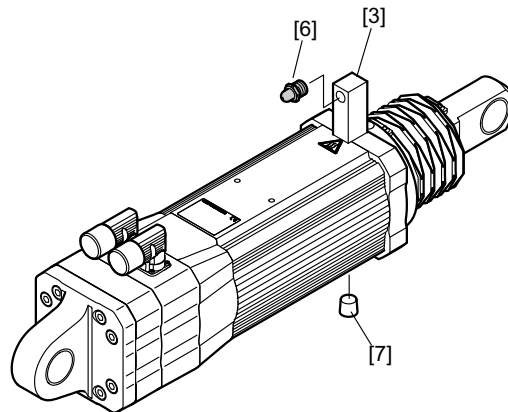
The threaded elbow joint is not included in the assembly kit and must be ordered from SEW-EURODRIVE separately.

Air pockets in the lubrication system



INFORMATION

Air trapped in the lubrication system could lead to an inadequate supply of lubricant to the spindles. The system must be vented according to the steps described below.



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1. Mount the threaded elbow angle [3], tighten it manually and insert the greasing nipple [6].
2. Release the screw plug [7] and remove it.
3. Press enough grease into the threaded elbow joint [3] until the grease escaping from the screw plug bore [7] has no bubbles.
4. Turn the screw plug [7] back in and tighten it.
5. For more information on assembly, see the assembly procedure described in section 9.6.



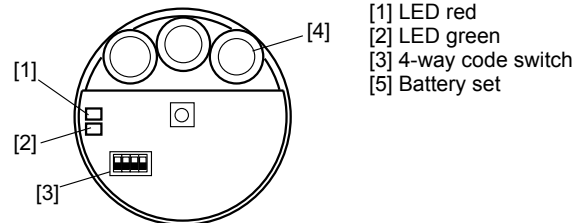
9.7.4 Lubricator startup

Star Vario (SV)

The code switches of the Star Vario version are factory set to a dispensing time of 12 months or a dispensing volume of 60 cm³, which is sufficient for standard applications.

When the electric cylinder is started up, the Star Vario lubricator must be activated. Activate the lubricator by turning the rotary switch to the **ON** position.

Status display



LED	Signal	Signal intervals	Operating state
Green	Flashing	Every 15 seconds	Operation (OK)
Red	Flashing	Every 8 seconds	Fault/malfunction
Green and red	Flashing	Every 3 seconds	LC unit empty
Red	Flashing	Constant	Vario dispensing

	12 months (SEW factory setting)	6 months	3 months	1 month
Runtime setting coding	 Time Volume	 Time Volume	 Time Volume	 Time Volume
Dispensing volume per day	0.17 cm ³	0.33 cm ³	0.67 cm ³	2.0 cm ³



Inspection and Maintenance

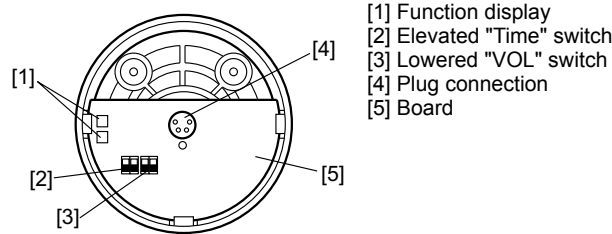
Installation and startup of Star Vario/Star Control lubricators

Star Control Time (ST)

The code switches of the Star Control Time variant are set to a dispensing quantity of 0.69 cm³ for every 100 operating hours or a dispensing volume of 60 cm³.

The Star Control Time variant is directly connected to the voltage supply and controller that control the lubricator in motor operation. Thus, a manual activation is not necessary.

Status display



LED	Signal	Description
Green	Constant signal	OK = System functioning
Red	Constant signal < 30 sec. with motor start-up	Dispensing action
Red	Constant signal > 30 sec.	Fault/malfunction
Green and red	Constant signal	LC unit empty, replace

	(SEW factory setting)			
Runtime setting coding	 Time Volume	 Time Volume	 Time Volume	 Time Volume
Dispensing quantity for every 100 operating hours	0.69 cm ³	1.39 cm ³	2.78 cm ³	8.33 cm ³



INFORMATION

As soon as the voltage (15 - 25 V_{DC}, max. 30 V_{DC}) is present, the lubricator dispenses the set volume in determined time intervals. The voltage must be present for at least 2 minutes to ensure the correct operating time.

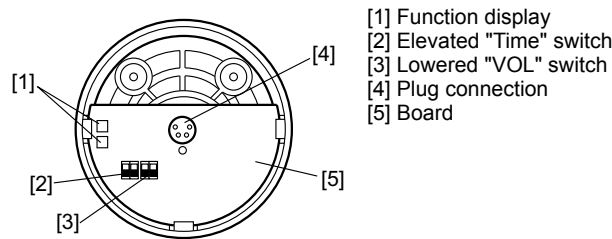


Star Control Impulse (SI)

The code switches of the Star Control Impulse variant are set to a dispensing quantity of 0.53 cm³ per impulse or a dispensing volume of 60 cm³.

The Star Control Impulse variant is directly connected to the voltage supply and controller that control the lubricator in motor operation. Thus, a manual activation is not necessary.

Status display



LED	Signal	Description
Green	Constant signal	OK = System functioning
Red	Constant signal < 30 sec. with motor start-up	Dispensing action
Red	Constant signal > 30 sec.	Fault/malfunction
Green and red	Constant signal	LC unit empty, replace

		(SEW factory setting)		
Runtime setting coding	 Time Volume	 Time Volume	 Time Volume	 Time Volume
Dispensing volume per impulse	0.26 cm ³	0.53 cm ³	1.06 cm ³	2.11 cm ³

	<p>INFORMATION</p> <p>As soon as the voltage (15 - 25 V_{DC}, max. 30 V_{DC}) is present, the lubricator dispenses the set volume once. The voltage must be present long enough for the dispensing process to be completed (max 2 minutes).</p>
--	--

	<p>INFORMATION</p> <p>The voltage supply must be interrupted for at least 15 seconds and re-connected for each dispensing process.</p>
--	---



9.8 Size CMS63 with oil lubrication

The sealing system and the components of these drives have been developed and tested to complement each other. Observe the following notes in order not to reduce the service life:

- Do not paint the piston rod
- Do not expose the piston rod to potential damage resulting from hard components
- Make sure that the joints are free to move
- Visually check for any leakages regularly, at least every other week
- Oil change every 5 years or after 10,000 hours of operation

9.8.1 Replacement interval of wearing parts

The drive reaches the end of its service life after 10,000 hours of nominal operation. A general overhaul and refit of the drive is not recommended.

Replacement intervals of the components	
Threaded spindle	Not necessary
A- and B-end bearing	Not necessary
Seal	Not necessary

9.8.2 Maintenance intervals

Every 2 weeks

- Visually check for leakage.

Every 3 years


- Change the oil.

Lubricating oil	Mobil SHC 630 (standard) Castrol Optileb GT 220 (food-grade oil) ¹⁾				
	100	200	400	600	
Stroke length [mm]					
Amount of oil [ml]	KGT	220	450	900	1320
	PGT	260	520	-	-

1) The optional lubricant will be available as of Q1 2010.

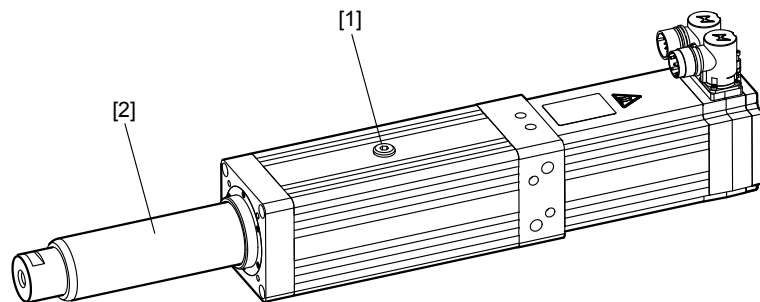


9.8.3 Removing and reinserting the oil screw plug

	NOTICE
	<p>Removing and reinserting the oil screw plug [1] of the electric cylinder incorrectly can damage the unit.</p> <p>Possible damage to property</p> <ul style="list-style-type: none"> Note the following:

- Remove the oil screw plug slowly; it might be under pressure depending on the position of the piston rod.
- We recommend to remove the screw plug with the piston rod [2] extended as this position bears the lowest pressure.
- Do only reinsert the oil screw plug [1] (20 Nm tightening torque) with the piston rod **extended!**

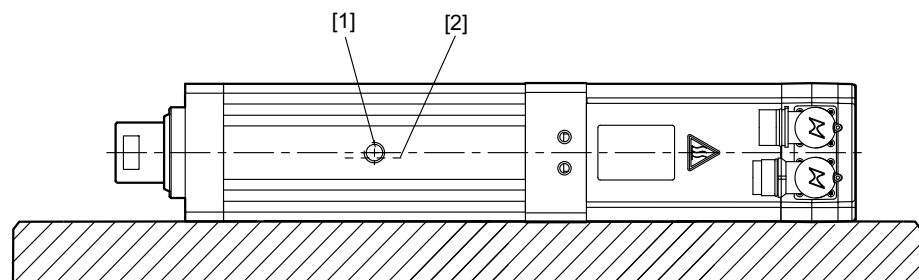
Thus, you make sure that there is no negative pressure inside the motor. The sealing system has not been designed for negative pressure. It will become leaky if positive and negative pressure constantly alternate!



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9.8.4 Checking the oil level

- Position the motor with the oil screw plug pointing upwards.
- Remove the oil screw plug [1] as described in the previous chapter.
- Completely retract the piston rod.
- Position the electric cylinder horizontally as illustrated below.
- Place a container underneath the oil drain plug [1].
- Slowly remove the oil screw plug [1]. Small amounts of oil may leak out as the permitted max. oil level is higher than the lower edge of the oil level bore.
- The correct oil level [2] is in line with the oil screw plug [1].



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8. If the oil level is too low, do the following:
 - Fill in additional oil of the same type via the oil screw plug [1] until the oil level is at the lower edge of the oil level bore.
9. Screw the oil screw plug [1] back in.

9.8.5 Oil change

Read the following notes before you begin to change the oil.

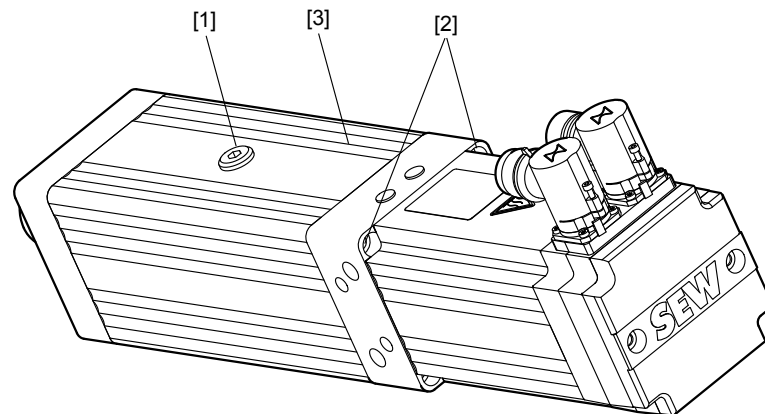


INFORMATION

Prevent foreign bodies from entering into the motor during the following work. Provide for a clean working environment.

Draining the oil

1. Extend the piston rod.
2. Open the oil screw plug [1].
3. Loosen the 4 retaining screws [2] of the built-on housing [3].

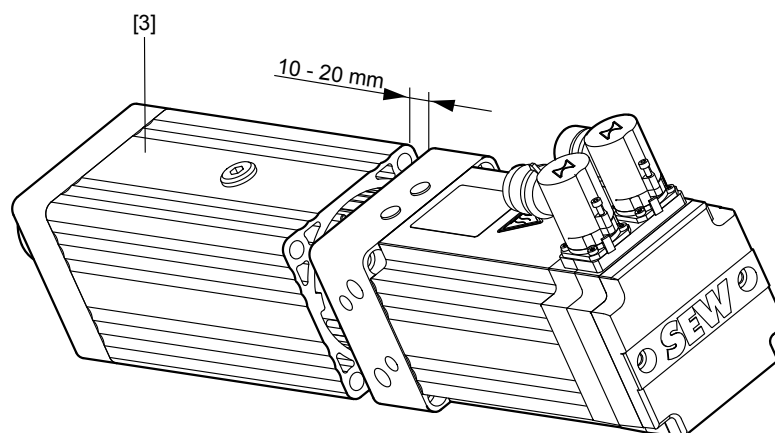


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4. Place the electric cylinder horizontally on a oil-drainage container.
5. Remove the 4 retaining screws [2] of the built-on housing [3].



- Carefully pull the built-on housing [3] from the rest of the motor until there is a gap of 10 - 20 mm.



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- Completely drain the oil. Position the piston rod 20 - 60 mm higher, if necessary, so that the oil drains off faster from the piston rod and the spindle nut.

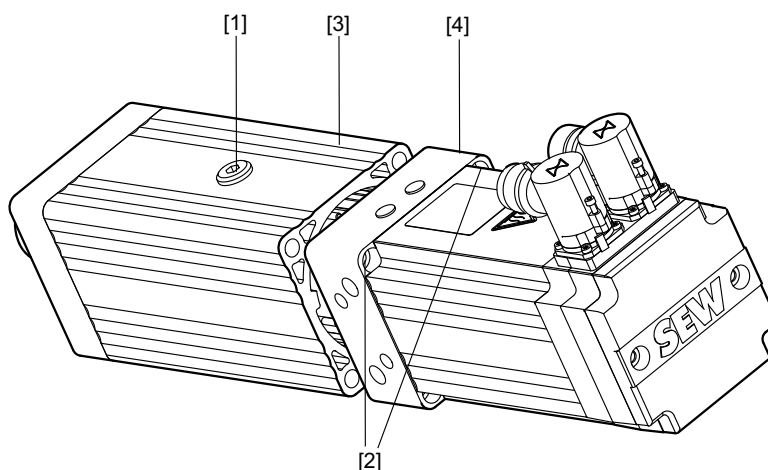


INFORMATION

Any dripping oil must be removed immediately with an oil binding agent.

Filling in the oil

- Clean the sealing surface between the built-on housing [3] and the motor [4] using a soft, lint-free cloth.
- Push the built-on housing [3] and the motor [4] back together.



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Inspection and Maintenance

Size CMS63 with oil lubrication

3. Reinsert and tighten the 4 retaining screws [2] to bolt the built-on housing [3] and the motor [4] together (10 Nm tightening torque).
4. Fill in new oil of the same grade via the oil screw plug [1]. You must not mix different lubricants.
 - Fill in the amount of oil specified on the nameplate through the opening for the oil screw plug [1].
 - Check the oil level. Observe the notes in section 9.7.4.



INFORMATION

Any dripping oil must be removed immediately with an oil binding agent.

5. Reinsert the oil screw plug β 1[. Observe the notes in section 9.8.3.

10 Declaration of Conformity

EG-Konformitätserklärung

EC Declaration of Conformity
Déclaration de conformité CE



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EURODRIVE

Nr./No/N° 900100007

SEW EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42, D-76646 Bruchsal

erklärt in alleiniger Verantwortung die Konformität der folgenden Produkte
declares under sole responsibility conformity of the following products
déclare, sous sa seule responsabilité, la conformité des produits mentionnés ci-après

Elektrozylinder der Baureihe: CMS
Spindle drive motors of the series:
Vérins électriques des séries:

mit der
with the / respectent la

Niederspannungsrichtlinie: 2006/95/EG
Low Voltage Directive / Directive Basse Tension: 2006/95 EC / 2006/95 CE

angewandte harmonisierte Normen:
applied harmonized standards / Normes harmonisées appliquées

EN 60034-1:2004

EN 60664-1:2003

Ort/Datum
Place/date / Lieu et date

Geschäftsführer Vertrieb und Marketing
Managing Director Sales and Marketing
Directeur général international commercial et marketing

Bruchsal, 24.01.2007


H. Sondermann



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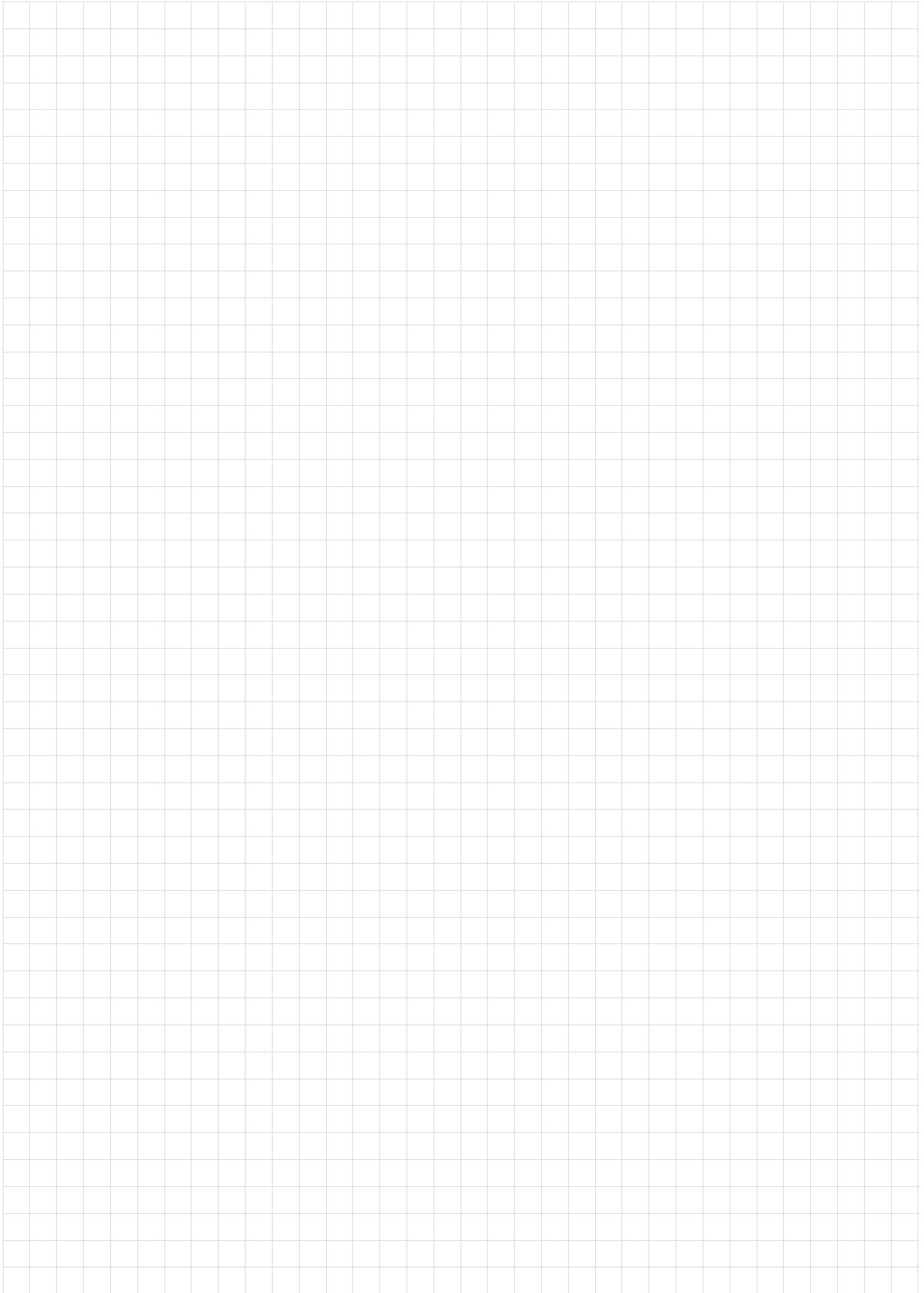
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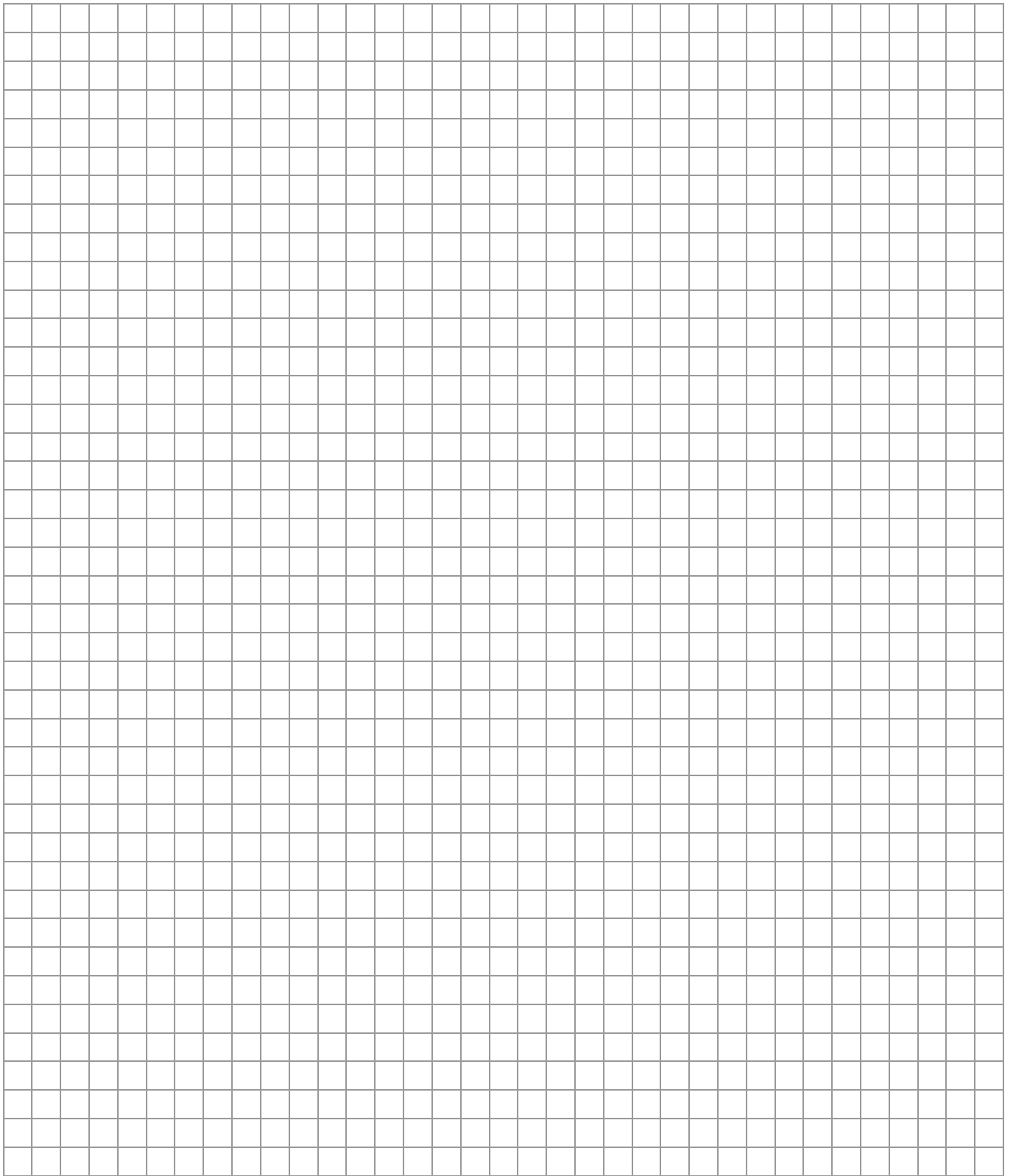
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