



## 2 Product Description and Overview of Types

### 2.1 General information

**Power and torque** The details on power and torque given in the catalog refer to mounting position M1 and similar mounting positions, where the input gear stage does not completely run under oil. In addition, the gearmotors are assumed to be standard versions with standard lubrication and under normal ambient conditions.

**Input speeds** The torque data in this catalog are based on the following input speed:

- $n_e = 1500$  1/min with DFS/CFM synchronous servomotors.
- $n_e = 1400$  1/min with CT/CV asynchronous servomotors.

**Noise levels** The noise levels of all SEW servo gearmotors and servomotors are well within the maximum permitted noise levels laid down by the VDI guideline 2159 for gear units and EN 60034 for motors.

**Coating** The servo gear units, synchronous and asynchronous servomotors and servo gearmotors from SEW-EURODRIVE will be coated as follows:

Type	DFS/CFM synchronous servomotor	CT/CV asynchronous servomotor
Servomotor without gear unit	RAL 9005 black	RAL 7031 blue gray
R / F / K / S servo gearmotor	RAL 7031 blue gray	RAL 7031 blue gray

Special coatings are available on request.

**Weights** Please note that all weights shown in the catalog exclude the oil fill for the gearmotors. The weight varies according to gear unit design and gear unit size. The lubricant fill is dependent on the mounting position, and consequently it is impossible to make any generally valid statements. Refer to "Lubricants" in the "Design and Operating Notes" section for recommended lubricant fill quantities depending on the mounting position. The exact weight is given in the order confirmation.

**Air admission and accessibility** The gearmotors/brake motors must be mounted on the driven machine in such a way that both axially and radially there is enough space left for unimpeded air admission and for the purposes of maintenance of the brake. Please also refer to the notes on the motor dimension sheets in this regard.



***NOCO® fluid for protection against contact corrosion***

As standard, all shaft-mounted gearmotors are supplied with NOCO® fluid, a paste that prevents contact corrosion. Use this paste in accordance with the instructions in the gear unit operating instructions. It facilitates service and stripping down jobs.

NOCO® fluid is food grade according to USDA-H1. You can tell that NOCO® fluid is a food grade oil by the USDA-H1 identification label on its packaging.

***Brake motors***

On request, motors and gearmotors can be supplied with an integrated mechanical brake. The SEW-EURODRIVE brake is an electromagnetic disk brake with a DC coil that releases electrically and brakes using spring force. The design principle means the brake is applied if the power fails. This means it complies with fundamental safety requirements.

The brake can also be released mechanically if equipped with manual brake release. A hand lever that springs back automatically is supplied with the brake. Manual brake release is not available with DFS servomotors. The brake is activated by a brake control system accommodated either in the wiring space of the motor or in the control cabinet.

A significant feature of the brakes is their very short length. The integrated construction of the SEW-EURODRIVE brake motor permits particularly compact and sturdy solutions.

***Reduced backlash version***

Gear units with reduced backlash in helical, parallel shaft helical and helical-bevel design are available as of gear unit size 37. The circumferential backlash of these gear units is considerably less than that of the standard versions so that positioning tasks can be solved with great precision. The circumferential backlash is specified in angular minutes in the [ ' ] combination overviews. The dimension drawings for the standard versions are applicable.

***International markets***

SEW-EURODRIVE is a member of the AGMA (American Gear Manufacturers' Association), and as such, all its gear units and geared motors conform to AGMA specifications.

We supply motors for connection conditions according to CSA and NEMA standards on request (registered with UL).

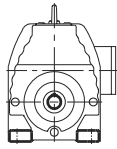
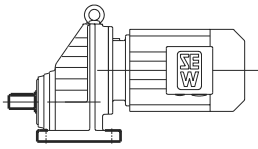


## 2.2 Gearmotor versions

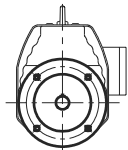
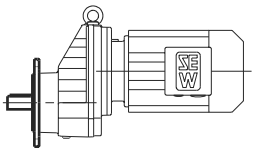
### Helical gearmotors

The following helical gearmotor types can be supplied:

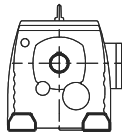
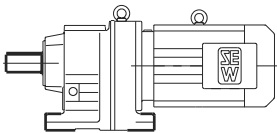
2



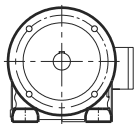
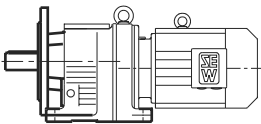
**RX..DS/CM..**  
**RX..CT/CV..**  
Single-stage foot-mounted helical gearmotor



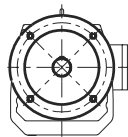
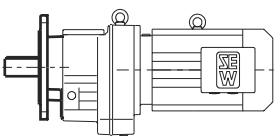
**RXF..DS/CM..**  
**RXF..CT/CV..**  
Single-stage flange-mounted helical gearmotor



**R..DS/CM..**  
**R..CT/CV..**  
Foot-mounted helical gearmotor



**R..F DS/CM**  
**R..F CT/CV..**  
Foot and flange-mounted helical gearmotor



**RF..DS/CM**  
**RF..CT/CV..**  
Flange-mounted helical gearmotor

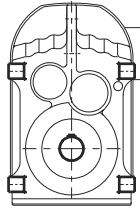
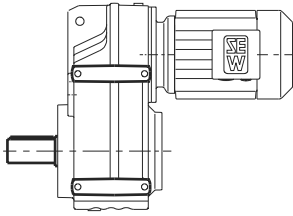
03163BXX



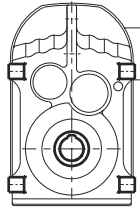
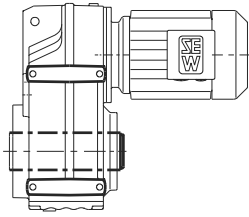
## Product Description and Overview of Types

### Gearmotor versions

**Parallel shaft helical gearmotors** The following parallel shaft helical gearmotor types can be supplied:

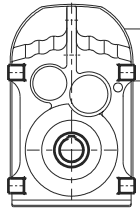
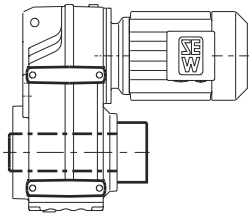


**F..DS/CM..**  
**F..CT/CV..**  
Foot-mounted parallel shaft helical gearmotor

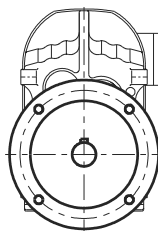
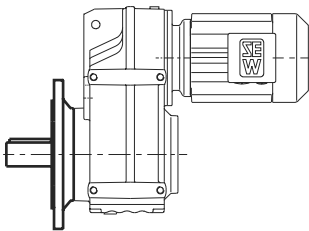


**FA..B DS/CM..**  
**FA..B CT/CV..**  
Foot-mounted parallel shaft helical gearmotor with hollow shaft

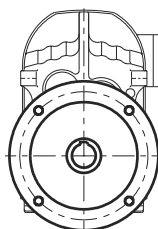
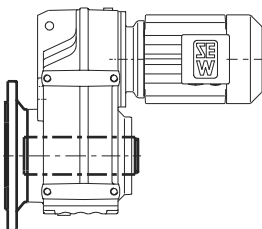
**FV..B DS/CM..**  
**FV..B CT/CV..**  
Foot-mounted parallel shaft helical gearmotor with hollow shaft and splined hollow shaft to DIN 5480



**FH..B DS/CM..**  
**FH..B CT/CV..**  
Foot-mounted parallel shaft helical gearmotor with hollow shaft and shrink disc



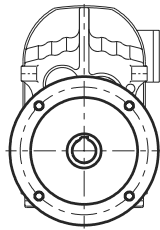
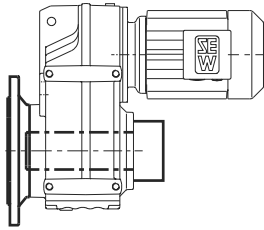
**FF..DS/CM..**  
**FF..CT/CV..**  
Parallel shaft helical gearmotor in B5 flange-mounted version



**FAF..DS/CM..**  
**FAF..CT/CV..**  
Parallel shaft helical gearmotor in B5 flange-mounted version with hollow shaft

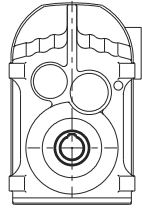
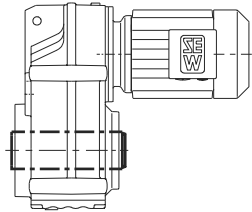
**FVF..DS/CM..**  
**FVF..CT/CV..**  
Parallel shaft helical gearmotor in B5 flange-mounted version with hollow shaft and splined hollow shaft to DIN 5480

03165AXX



**FHF..DS/CM..**  
**FHF..CT/CV..**

Parallel shaft helical gearmotor in B5 flange-mounted version with hollow shaft and shrink disc

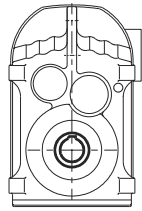
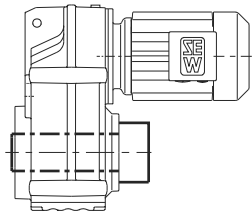


**FA..DS/CM..**  
**FA..CT/CV..**

Parallel shaft helical gearmotor with hollow shaft

**FV..DS/CM..**  
**FV..CT/CV..**

Parallel shaft helical gearmotor with hollow shaft and splined hollow shaft to DIN 5480

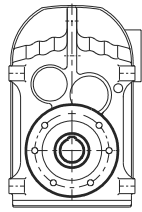
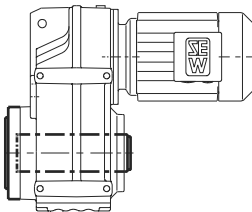


**FH..DS/CM..**  
**FH..CT/CV..**

Parallel shaft helical gearmotor with hollow shaft and shrink disc

**FT..DS/CM..**  
**FT..CT/CV..**

Parallel shaft helical gearmotor with hollow shaft and TorqLOC<sup>®</sup> hollow shaft mounting system

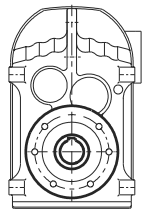
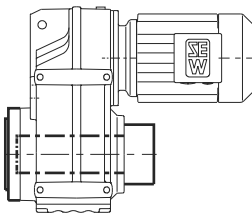


**FAZ..DS/CM..**  
**FAZ..CT/CV..**

Parallel shaft helical gearmotor in B14 flange-mounted version with hollow shaft

**FVZ..DS/CM..**  
**FVZ..CT/CV..**

Parallel shaft helical gearmotor in B14 flange-mounted version with hollow shaft and splined hollow shaft to DIN 5480



**FHZ..DS/CM..**  
**FHZ..CT/CV..**

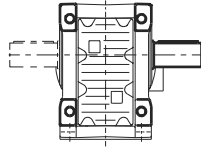
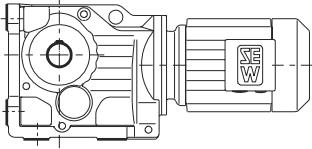
Parallel shaft helical gearmotor in B14 flange-mounted version with hollow shaft and shrink disc

03166AXX

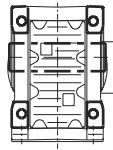
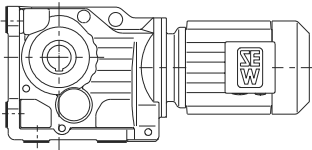


#### Helical-bevel gearmotors

The following helical-bevel gearmotor types can be supplied:

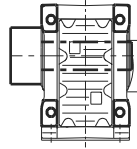
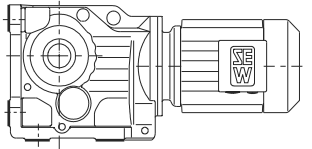


**K..DS/CM..**  
**K..CT/CV..**  
 Foot-mounted helical-bevel gearmotor

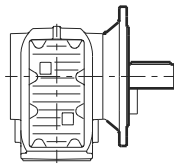
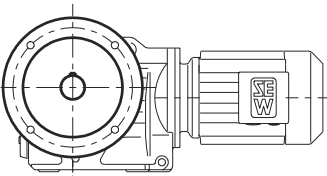


**KA..B DS/CM..**  
**KA..B CT/CV..**  
 Foot-mounted helical-bevel gearmotor with hollow shaft

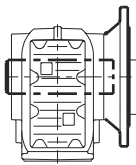
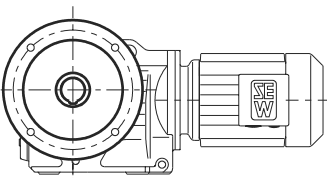
**KV..B DS/CM..**  
**KV..B CT/CV..**  
 Foot-mounted helical-bevel gearmotor with hollow shaft and splined hollow shaft to DIN 5480



**KH..B DS/CM..**  
**KH..B CT/CV..**  
 Foot-mounted helical-bevel gearmotor with hollow shaft and shrink disc



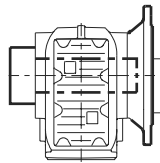
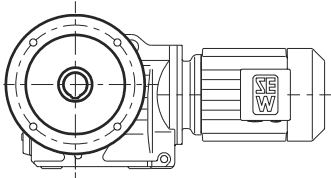
**KF..DS/CM..**  
**KF..CT/CV..**  
 Helical-bevel gearmotor in B5 flange-mounted version



**KAF..DS/CM..**  
**KAF..CT/CV..**  
 Helical-bevel gearmotor in B5 flange-mounted version with hollow shaft

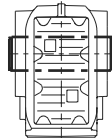
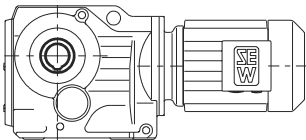
**KVF..DS/CM**  
**KVF..CT/CV..**  
 Helical-bevel gearmotor in B5 flange-mounted version with hollow shaft and splined hollow shaft to DIN 5480

03173AXX



**KHF..DS/CM..**  
**KHF..CT/CV..**

Helical-bevel gearmotor in B5 flange-mounted version with hollow shaft and shrink disc

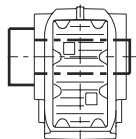
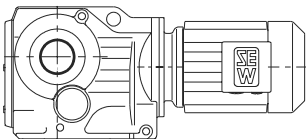


**KA..DS/CM..**  
**KA..CT/CV..**

Helical-bevel gearmotor with hollow shaft

**KV..DS/CM..**  
**KV..CT/CV..**

Helical-bevel gearmotor with hollow shaft and splined hollow shaft to DIN 5480

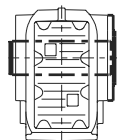
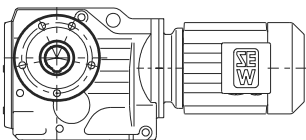


**KH..DS/CM..**  
**KH..CT/CV..**

Helical-bevel gearmotor with hollow shaft and shrink disc

**KT..DS/CM..**  
**KT..CT/CV..**

Helical-bevel gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system

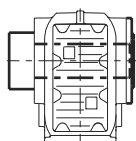
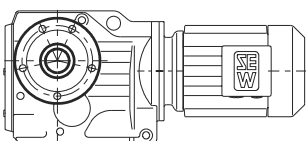


**KAZ..DS/CM..**  
**KAZ..CT/CV..**

Helical-bevel gearmotor in B14 flange-mounted version with hollow shaft

**KVZ..DS/CM..**  
**KVZ..CT/CV..**

Helical-bevel gearmotor in B14 flange-mounted version with hollow shaft and splined hollow shaft to DIN 5480



**KHZ..DS/CM..**  
**KHZ..CT/CV..**

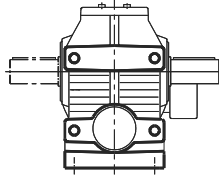
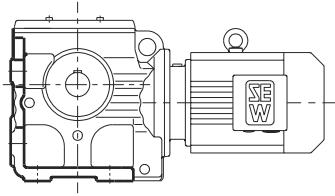
Helical-bevel gearmotor in B14 flange-mounted version with hollow shaft and shrink disc

03174AXX

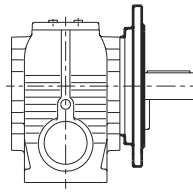
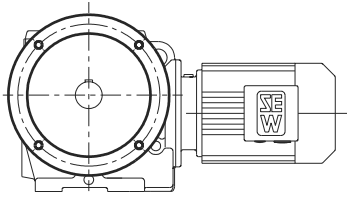


#### Helical-worm gearmotors

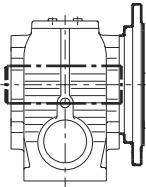
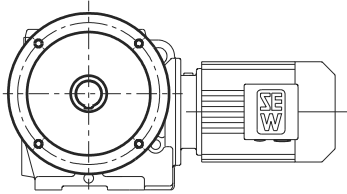
The following helical-worm gearmotor types can be supplied:



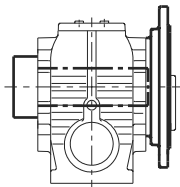
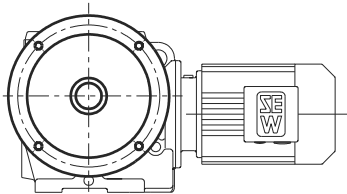
**S..DS/CM..**  
**S..CT/CV..**  
Foot-mounted helical-worm gearmotor



**SF..DS/CM..**  
**SF..CT/CV..**  
Helical-worm gearmotor in B5 flange-mounted version



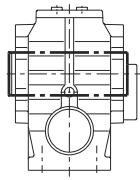
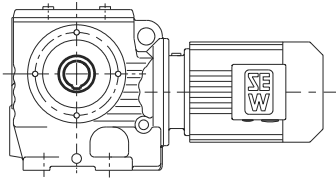
**SAF..DS/CM..**  
**SAF..CT/CV..**  
Helical-worm gearmotor in B5 flange-mounted version with hollow shaft



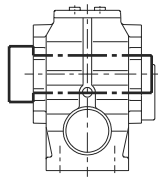
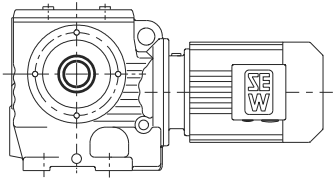
**SHF..DS/CM..**  
**SHF..CT/CV..**  
Helical-worm gearmotor in B5 flange-mounted version with hollow shaft and shrink disc

03180AXX

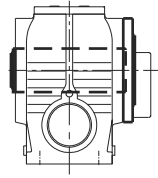
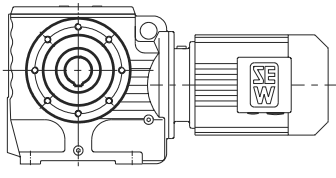




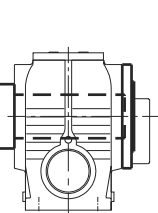
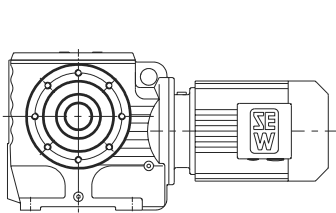
**SA..DS/CM..**  
**SA..CT/CV..**  
Helical-worm gearmotor with hollow shaft



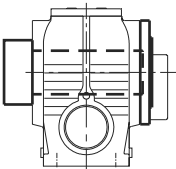
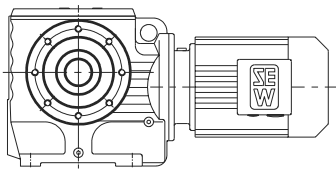
**SH..DS/CM..**  
**SH..CT/CV..**  
Helical-worm gearmotor with hollow shaft and shrink disc



**ST..DS/CM..**  
**ST..CT/CV..**  
Helical-worm gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system



**SAZ..DS/CM..**  
**SAZ..CT/CV..**  
Helical-worm gearmotor in B14 flange-mounted version with hollow shaft



**SHZ..DS/CM..**  
**SHZ..CT/CV..**  
Helical-worm gearmotor in B14 flange-mounted version with hollow shaft and shrink disc

03181AXX



### 2.3 Unit designations for gear units and options

#### **Helical gear units**

<i>RX..</i>	Single-stage foot-mounted
<i>RXF..</i>	Single-stage flange-mounted
<i>R..</i>	Foot-mounted
<i>R..F</i>	Foot and flange-mounted
<i>RF..</i>	Flange-mounted

#### **Parallel shaft helical gear unit**

<i>F..</i>	Foot-mounted version
<i>FA..B</i>	Foot-mounted and hollow shaft
<i>FH..B</i>	Foot-mounted and hollow shaft with shrink disc
<i>FV..B</i>	Foot-mounted and splined hollow shaft to DIN 5480
<i>FF..</i>	B5 flange-mounted
<i>FAF..</i>	B5 flange-mounted and hollow shaft
<i>FHF..</i>	B5 flange-mounted and hollow shaft with shrink disc
<i>FVF..</i>	B5 flange-mounted and splined hollow shaft to DIN 5480
<i>FA..</i>	Hollow shaft
<i>FH..</i>	Hollow shaft with shrink disc
<i>FT..</i>	Hollow shaft with TorqLOC <sup>®</sup> hollow shaft mounting system
<i>FV..</i>	Splined hollow shaft to DIN 5480
<i>FAZ..</i>	B14 flange-mounted and hollow shaft
<i>FHZ..</i>	B14 flange-mounted and hollow shaft with shrink disc
<i>FVZ..</i>	B14 flange-mounted and splined hollow shaft to DIN 5480



**Helical-bevel gear units**

K..	Foot-mounted version
KA..B	Foot-mounted and hollow shaft
KH..B	Foot-mounted and hollow shaft with shrink disc
KV..B	Foot-mounted and splined hollow shaft to DIN 5480
KF..	B5 flange-mounted
KAF..	B5 flange-mounted and hollow shaft
KHF..	B5 flange-mounted and hollow shaft with shrink disc
KVF..	B5 flange-mounted and splined hollow shaft to DIN 5480
KA..	Hollow shaft
KH..	Hollow shaft with shrink disc
KT..	Hollow shaft with TorqLOC® hollow shaft mounting system
KV..	Splined hollow shaft to DIN 5480
KAZ..	B14 flange-mounted and hollow shaft
KHZ..	B14 flange-mounted and hollow shaft with shrink disc
KVZ..	B14 flange-mounted and splined hollow shaft to DIN 5480

**Helical-worm gear unit**

S..	Foot-mounted version
SF..	B5 flange-mounted
SAF..	B5 flange-mounted and hollow shaft
SHF..	B5 flange-mounted and hollow shaft with shrink disc
SA..	Hollow shaft
SH..	Hollow shaft with shrink disc
ST..	Hollow shaft with TorqLOC® hollow shaft mounting system
SAZ..	B14 flange-mounted and hollow shaft
SHZ..	B14 flange-mounted and hollow shaft with shrink disc

**R, F, K gear unit option**

/R Reduced backlash

**K and S gear unit option**

/T with torque arm

**F gear unit option**

/G with rubber buffer



#### 2.4 Unit designations for servomotors and options

##### **Synchronous servomotors**

<i>DS...</i>	Motor for mounting to size 56 gear units
<i>DFS...</i>	Size 56 in flange-mounted version
<i>CM...</i>	Motor for mounting to gear units of sizes 71 / 90 / 112
<i>CFM...</i>	Sizes 71 / 90 / 112 in flange-mounted version

##### **Standard equipment for synchronous servomotors**

<i>/SM.0</i>	Motor plug connector (socket on motor end only)
<i>/SB.0</i>	Plug connector motor + brake (socket on motor end only)
<i>/RH1M</i>	Resolver
<i>/RH1L</i>	Resolver for brake motors
<i>/TF</i>	Thermistor (PTC resistor)
<i>/KTY</i>	Temperature sensor

##### **Synchronous servomotor options**

<i>/B</i>	Size 56 disc brake
<i>/BR</i>	Size 71 / 90 / 112 disc brake
<i>../HR</i>	.. with automatic manual brake release sizes 71 / 90 / 112
<i>/SM..</i>	Motor plug connector with code number for size and connection cross section
<i>/SB..</i>	Plug connector for motor + brake with code number for size and connection cross section
<i>/ES1H</i>	Single-turn HIPERFACE® encoder, spread shaft, size 56 / 71 / 90 / 112
<i>/AS1H</i>	Multi-turn HIPERFACE® encoder, spread shaft, size 56 / 71 / 90 / 112
<i>/AV1H</i>	Multi-turn HIPERFACE® encoder, solid shaft, size 56 / 71 / 90 / 112
<i>/AV1Y</i>	Multi-turn SSI encoder, solid shaft, size 56
<i>/VR</i>	Forced cooling fan
<i>/KK</i>	Terminal box
<i>/KK5</i>	Terminal box for radial encoder
<i>/KK6</i>	Terminal box for axial encoder



**Asynchronous servomotors**

CT...	Foot-mounted / attached motor sizes 71 ... 90
CFT...	Flange mounted sizes 71 ... 90
CV...	Foot-mounted / attached motor sizes 100 ... 200
CFV...	Flange mounted sizes 100 ... 200

**Standard equipment for asynchronous servomotors**

/TF	Thermistor (PTC resistor)
/ES1S	Encoder with spread shaft, sin/cos signals, sizes 71 ... 100
/ES2S	Encoder with spread shaft, sin/cos signals, sizes 112M ... 132S
/EV1S	Encoder with solid shaft, sin/cos signals, sizes 132M ... 200

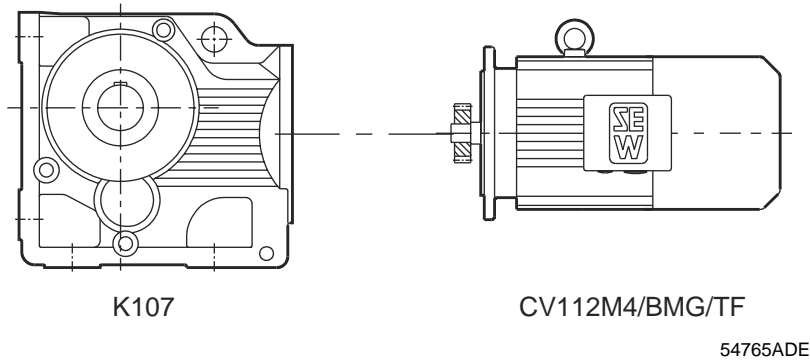
**Asynchronous servomotor options**

/BM(G)	Disk brake
../HF	.. with lockable manual brake release
../HR	.. with automatic manual brake release
/TH	Thermostat (bimetallic switch)
/V	Forced cooling fan, three-phase current, sizes 132M ... 200
/VR	Forced cooling fan, direct current, sizes 71 ... 132S
/VS	Forced cooling fan, single-phase alternating current, sizes 71 ... 132S
/C	Protection canopy for the fan guard
/ES1R	Encoder with spread shaft, TTL (RS-422), sizes 71 ... 100
/ES2R	Encoder with spread shaft, TTL (RS-422), sizes 112 .. 132S
/EV1R	Encoder with solid shaft, TTL (RS-422), sizes 71 ... 200
/EV1S	Encoder with solid shaft, sin/cos signals, sizes 71 ... 132S
/AV1Y	Multi-turn SSI encoder, solid shaft
/AV1A	Multi-turn HIPERFACE® encoder, solid shaft
/EV1A	Mounting device for encoders with solid shaft
/IS	Integrated plug connector
A..7	HAN.. plug connector (Harting)

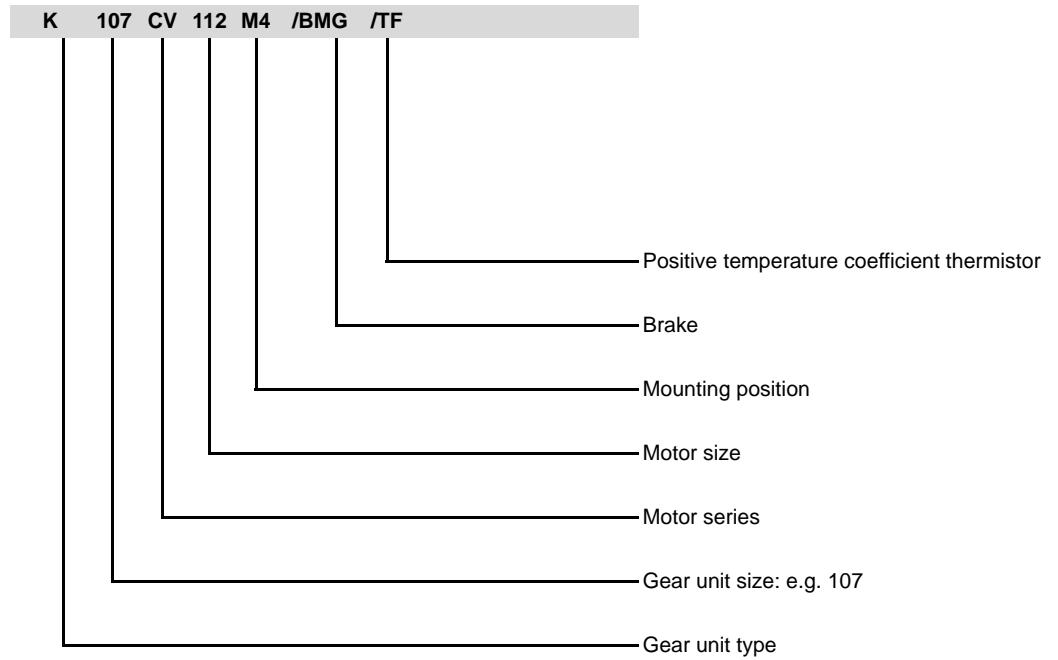


**Product Description and Overview of Types**  
Unit designations for servomotors and options

Example: Order code for helical-bevel servo gearmotors



For example, a helical-bevel servomotor with brake and positive temperature coefficient thermistor has the following unit designation:



**Note!**

The nameplate of the K... helical-bevel servo gearmotor is fixed to the servomotor!



## 2.5 Corrosion and surface protection

### General

SEW-EURODRIVE offers various optional protective measures for operating motors and gear units under special ambient conditions.

The protective measures are made up of two groups:

- Corrosion protection KS for motors
- Surface protection OS for motors and gear units

For motors, optimum protection is offered by a combination of corrosion protection KS and surface protection OS.

In addition, special optional protective measures for the output shafts are also possible.

### Corrosion protection KS

Corrosion protection KS for motors comprises the following measures:

- All retaining screws that are removed in operation are made from stainless steel.
- The nameplates are made from stainless steel.
- Various motor components are provided with a top coating.
- The flange contact surfaces and shaft ends are treated with a temporary anti-corrosion agent.
- Additional measures for brake motors.

A sticker labeled "KORROSIONSSCHUTZ" (corrosion protection) indicates special treatment has been applied.



Motors with a forced cooling fan and motors with a spread shaft encoder (ES..) cannot be supplied with corrosion protection KS.



#### Surface protection OS

Instead of the standard surface protection, motors and gear units are optionally available with exterior surface protection OS1, OS2, OS3 or OS4. The special procedure "Z" can also be performed in addition to OS1, OS2, OS3 and OS4. The special procedure "Z" means that large surface recesses are sprayed with a rubber filling prior to painting.

Surface protection	Coating structure	Required coating thickness (nominal dry film thickness) DIN EN ISO 12944-5 [NDFT]	Suitable for
<b>Standard</b>	1 × dip priming 1 × one-pack topcoat	70 µm	<ul style="list-style-type: none"> <li>• Normal environmental impact</li> <li>• Relative humidity below 90 %</li> <li>• Surface temperature up to max. 120 °C</li> <li>• Corrosivity category C1<sup>1)</sup></li> </ul>
<b>OS1</b>	1 × dip priming 1 × two-pack base coat 1 × two-pack varnish	150 µm	<ul style="list-style-type: none"> <li>• Low environmental impact</li> <li>• Relative humidity max. 95 %</li> <li>• Surface temperature up to max. 120 °C</li> <li>• Corrosivity category C2<sup>1)</sup></li> </ul>
<b>OS2</b>	1 × dip priming 2 × two-pack base coat 1 × two-pack varnish	210 µm	<ul style="list-style-type: none"> <li>• Medium environmental impact</li> <li>• Relative humidity up to 100 %</li> <li>• Surface temperature up to max. 120 °C</li> <li>• Corrosivity category C3<sup>1)</sup></li> </ul>
<b>OS3</b>	1 × dip priming 2 × two-pack base coat 2 × two-pack varnish	270 µm	<ul style="list-style-type: none"> <li>• High environmental impact</li> <li>• Relative humidity up to 100 %</li> <li>• Surface temperature up to max. 120 °C</li> <li>• Corrosivity category C4<sup>1)</sup></li> </ul>
<b>OS4</b>	1 × dip primer 2 × two-pack base coat 2 × two-pack varnish	320 µm	<ul style="list-style-type: none"> <li>• Very high environmental impact</li> <li>• Relative humidity up to 100 %</li> <li>• Surface temperature up to 120 °C</li> <li>• Corrosivity category C5-I<sup>1)</sup></li> </ul>

1) according to DIN EN ISO 12 944-2

#### Special protective measures

Gearmotor output shafts can be treated with special optional protective measures for operation subject to severe environmental pollution or in particularly demanding applications.

Action	Protection principle	Suitable for
<b>Kanisil coating</b>	Surface coating of the contact surface of the oil seal	Severe environmental pollution and in conjunction with FKM oil seal (Viton)
<b>Stainless steel output shaft</b>	Surface protection through high-quality material	Particularly exacting applications in terms of exterior surface protection

#### NOCO<sup>®</sup> fluid

For more information on NOCO<sup>®</sup> fluid, refer to page 10.





## 2.6 Extended storage

### Version

You can also order gear units prepared for "extended storage." In this case, a VCI (volatile corrosion inhibitor) is added to the lubricant in these gear units. Unless specified otherwise, the gear unit will be provided with exterior surface protection OS1. You can order OS2, OS3 or OS4 instead of OS1.

Surface protection	Suitable for	Corrosivity category to DIN EN ISO 12944-2
OS1	Low environmental impact	C2 (low)
OS2	Medium environmental impact	C3 (moderate)
OS3	High environmental impact	C4 (high)
OS4	Severe environmental impact	C5-I (severe)

### Oil fill

Note the following points concerning the oil fill:

- **Mineral oil (CLP) and synthetic oil (CLP HC):** Gear units will be supplied with an oil fill according to the mounting position (M1 ... M6) and are ready for operation.
- **Synthetic oil (CLP PG):** In some cases, gear units are supplied with an increased oil level. Before startup, adjust the oil level to match the required mounting position (M1 ... M6). The oil fill quantities for gear units are specified in Sec. 5.1 "Lubricants" (→ from page 84).



The gear units must remain tightly sealed until taken into operation to prevent the VCI corrosion protection agent from evaporating.

Always check the oil level before you take the gear unit into operation!

### Storage conditions

Comply with the storage conditions specified in the following table for extended storage:

Climate zone	Packaging <sup>1)</sup>	Storage location	Storage time
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	With roof, protected against rain and snow, no shock loads.	Up to three years with regular checks on the packaging and moisture indicator (rel. atmospheric humidity < 50 %).
	Open	With roof, enclosed at constant temperature and atmospheric humidity (5°C < $\vartheta$ < 60°C, < 50% relative atmospheric humidity). No sudden temperature fluctuations and controlled ventilation with filter (free from dirt and dust). No aggressive vapors and no shock loads.	Two years or more given regular inspections. Check for cleanliness and mechanical damage as part of the inspection. Check corrosion protection.
Tropical (Asia, Africa, Central and South America, Australia, New Zealand excluding temperate zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap. Protected against insect damage and mildew by chemical treatment.	With roof, protected against rain, no shock loads.	Up to three years with regular checks on the packaging and moisture indicator (rel. atmospheric humidity < 50 %).
	Open	With roof, enclosed at constant temperature and atmospheric humidity (5°C < $\vartheta$ < 60°C, < 50% relative atmospheric humidity). No sudden temperature fluctuations and controlled ventilation with filter (free from dirt and dust). No aggressive vapors and no shock loads. Protection against insect damage.	Two years or more given regular inspections. Check for cleanliness and mechanical damage as part of the inspection. Check corrosion protection.

1) Packaging must be performed by an experienced company using the packaging materials that have been expressly specified for the particular application.