



2 Product Description

2.1 General notes on the product description

Ambient temperature

Gear units and gearmotors from SEW-EURODRIVE can be operated in a wide ambient temperature range. The following standard temperature ranges are permitted for filling the gear units according to the lubricant table:

Gear unit	Filled with	Permitted standard temperature range
Helical, parallel shaft helical and helical-bevel gear units	CLP(CC) VG220	-10 °C ... +40 °C
Helical-worm gear unit	CLP(CC) VG680	0 °C ... +40 °C
Spiroplan® gear units	CLP(SEW-PG) VG460	-10 °C ... +40 °C

The rated data of the gear units and gearmotors specified in the catalog/price catalog refer to an ambient temperature of +25 °C.

Gear units and gearmotors from SEW-EURODRIVE can be operated outside the standard temperature range if project planning is adapted to ambient temperatures from -40 °C to +60 °C. Project planning must take special operating conditions into account and adapt the drive to the ambient conditions by selecting suitable lubricants and seals. This kind of project planning is generally recommended for increased ambient temperatures as of size 97 and for helical-worm gear units with small gear ratios. SEW-EURODRIVE will gladly perform this project planning for you.

If the drive is to be operated on a frequency inverter, you must also consider the project planning notes of the inverter and take into account the thermal effects of inverter operation.

Installation altitude

Due to the low air density at high installation altitudes, heat dissipation on the surface of motors and gear units decreases. The rated data listed in the catalog/price catalog applies to an installation altitude of maximum 1000 m above sea level. Installation altitudes of more than 100 m asl must be taken into account for project planning of gear units and gearmotors.

Power and torque

The power and torque ratings listed in the catalogs refer to mounting position M1 and similar mounting positions in which the input stage is not completely submerged in oil. In addition, the gearmotors are assumed to be standard versions with standard lubrication and under normal ambient conditions.

Please note that the motor power shown in the selection tables for gearmotors is subject to selection. However, the output torque and the desired output speed are essential for the application and need to be checked.

Speeds

The quoted output speeds of the gearmotors are recommended values. You can calculate the rated output speed based on the rated motor speed and the gear unit ratio. Please note that the actual output speed depends on the motor load and the supply system conditions.

Noise

The noise levels of all SEW-EURODRIVE gear units, motors and gearmotors are well within the maximum permitted noise levels set forth in the VDI guideline 2159 for gear units and IEC/EN 60034 for motors.



- Coating** Gear units, motors and gearmotors from SEW-EURODRIVE are painted with "blue/gray"/RAL 7031 machine paint according to DIN 1843 as standard. Special paints are available on request.
Exception: Spiroplan® W..10 DT56 gearmotors have an aluminum housing and are supplied unpainted as standard.
- Surface and corrosion protection** If required, all gear units, motors and gearmotors from SEW-EURODRIVE can also be supplied with special surface protection for applications in extremely humid and chemically aggressive environments.
- Weights** Please note that all weights shown in the catalogs exclude the oil fill for the gear units and gearmotors. The weights vary according to gear unit type and gear unit size. The lubricant fill depends on the mounting position which means no universally applicable information can be given. Please refer to "Lubricants" in the "Design and Operating Notes" section for recommended lubricant fill quantities depending on the mounting position. For the exact weight, refer to the order confirmation.
- Air admission and accessibility** The gearmotors/brakemotors 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, for maintenance work on the brake and, if required, for the MOVIMOT® inverter. Please also refer to the notes in the motor dimension sheets.
- Multi-stage gear units** You can achieve particularly low output speeds by using multi-stage gear units or multi-stage gearmotors. Such a setup requires a helical gear unit or gearmotor on the input end as a second gear unit.
It may be necessary to limit the motor power to match the maximum permitted output torque of the gear unit.
- Reduced backlash gear units** Helical, parallel-shaft helical and helical-bevel gear units with reduced backlash 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 technical data. The circumferential backlash for the output shaft is specified without load (max. 1% of the rated output torque); the gear unit input end is blocked. For further information, refer to section "Reduced backlash gear units" on page 94.
- NOCO® fluid for protection against contact corrosion** As standard, all shaft-mounted gear units and 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 a food grade substance according to USDA-H1. You can tell that NOCO® Fluid is a food grade oil by the USDA-H1 identification label on its packaging.
- RM gear units, RM gearmotors** RM gear units and RM gearmotors are a special type of helical gear units with an extended output bearing hub. They were designed especially for agitating applications and allow for high overhung and axial loads and bending moments. The other data are the same as for standard helical gear units and standard helical gearmotors. You can find special project planning notes for RM gearmotors in the "Project Planning for Gear Units/RM gear units" section.



Product Description

General notes on the product description

Spiroplan® right-angle gearmotors

Spiroplan® right-angle gearmotors are robust, single- and two-stage right-angle gearmotors with Spiroplan® gearing. The difference to the helical-worm gear units is the material combination of the steel-on-steel gearing, the special tooth meshing relationships and the aluminum housing. As a result, Spiroplan® right-angle gearmotors are wear-free, very quiet and light.

The particularly short design and the aluminum housing make for very compact and lightweight drive solutions.

After the running-in period, some sizes of Spiroplan® right-angle gearmotors are below the following sound pressure level in 4-pole motor operation on a 50 Hz supply system:

- Spiroplan® W..10 to W..30: 55 dB(A)

The sound-pressure level may be 3 to 5 dB(A) higher at time of delivery than after hours of regular operation.

The wear-free gearing and the life-long lubrication facilitate long periods of maintenance-free operation. The oil filling being independent of the mounting position, except for Spiroplan® W..37 and W..47 in mounting position M4 makes any position possible for Spiroplan® right-angle gearmotors without altering the quantity of oil. Identical hole spacing in the foot and face, as well as the equal shaft height to both, provides you with diverse mounting options.

Two different flange diameters are available. On request, Spiroplan® right-angle gearmotors can be equipped with a torque arm.

Brakemotors

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. Due to its operating principle, the brake is applied if the power fails. It meets the basic safety requirements. The brake can also be released mechanically if equipped with manual brake release. For this purpose, the brake is supplied with either a hand lever with automatic reset or an adjustable setscrew. The brake is controlled by a brake controller that is either installed in the motor wiring space or the control cabinet.

A characteristic feature of the brakes is their very short design. The brake bearing end shield is a part of both the motor and the brake. The integrated construction of the SEW-EURODRIVE brakemotor permits particularly compact and sturdy solutions.

International markets

On request, SEW-EURODRIVE supplies UL registered motors or CSA certified motors with connection conditions according to CSA and NEMA standard.

On request, SEW-EURODRIVE supplies UL registered MOVIMOT® drives with connection conditions according to NEMA standards.

For the Japanese market, SEW-EURODRIVE offers motors conforming to JIS standard. Contact your sales representative to assist you in such cases.



Components on the input side

The following components on the input side are available for the gear units from SEW-EURODRIVE:

- **Input covers with input shaft extension, optionally with**
 - Centering shoulder
 - Backstop
 - Motor mounting platform
- **Adapter**
 - For mounting IEC or NEMA motors with the option of a backstop
 - For mounting servomotors with a square flange
 - With torque limiting safety couplings and speed or slip monitor
 - With hydraulic centrifugal coupling, also with disk brake or backstop

Swing base

A swing base is a drive unit consisting of helical-bevel gear unit, hydraulic centrifugal coupling and electric motor. The complete arrangement is mounted to a rigid mounting rail.

Motor swings are available with the following optional accessories:

- Torque arm
- Mechanical thermal monitoring unit
- Contactless thermal monitoring unit



2.2 Corrosion and surface protection

General information

SEW-EURODRIVE offers various optional protective measures for operation of motors and gearmotors under special ambient conditions.

The protective measures comprise 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 KS corrosion protection and surface OS protection.

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

KS corrosion protection

KS corrosion protection for motors comprises the following measures:

- All retaining screws that are loosened during operation are made of stainless steel.
- The nameplates are made of stainless steel.
- A top coating is applied to various motor parts.
- The flange contact surfaces and shaft ends are treated with a temporary anti-corrosion agent.
- Additional measures for brakemotors.

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



Motors with forced cooling fan are not available with KS corrosion protection.



OS surface protection

Instead of the standard surface protection, the motors and gear units are available with surface protection OS1 to OS4 as an option. The special procedure 'Z' is also available. Special procedure 'Z' means that large surface recesses are sprayed with a rubber filling prior to painting.

Surface protection	Layers	NDFT ¹⁾ on gray-cast iron [µm]	Suitable for
Standard	1 × Dip primer 1 × One-pack top coat	About 50-70	<ul style="list-style-type: none"> • Normal ambient conditions • Relative humidity below 90 % • Max. surface temperature 120 °C • Corrosivity category C1²⁾
OS1	1 × Dip primer 1 × Two-pack base coat 1 × Two-pack top coat	About 120-150	<ul style="list-style-type: none"> • Low environmental impact • Relative humidity max. 95 % • Max. surface temperature 120 °C • Corrosivity category C2²⁾
OS2	1 × Dip primer 2 × Two-pack base coat 1 × Two-pack top coat	About 170-210	<ul style="list-style-type: none"> • Medium environmental impact • Relative humidity up to 100 % • Max. surface temperature 120 °C • Corrosivity category C3²⁾
OS3	1 × Dip primer 2 × Two-pack base coat 2 × Two-pack top coat	About 220-270	<ul style="list-style-type: none"> • High environmental impact • Relative humidity up to 100 % • Max. surface temperature 120 °C • Corrosivity category C4²⁾
OS4	1 × Dip primer 2 × Two-pack epoxy base layer 2 × Two-pack top coat	About 320	<ul style="list-style-type: none"> • Very high environmental impact • Relative humidity up to 100 % • Max. surface temperature 120 °C • Corrosivity category C5-1²⁾

1) NDFT (nominal dry film thickness) = Required coating thickness; Minimum thickness = 80 % NDFT; Maximum thickness = 3 x NDFT (DIN EN ISO 12944-5)

2) In accordance with 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.

Measure	Protection principle	Suitable for
FKM oil seal (Viton)	high quality material	drives subject to chemical contamination
Kanisil coating	surface coating of the contact surface of the oil seal	severe environmental impact and in conjunction with FKM oil seal (Viton)
stainless steel output shaft	surface protection with high-quality material	particularly demanding applications in terms of surface protection

NOCO[®] Fluid

As standard, SEW-EURODRIVE supplies NOCO[®] Fluid corrosion protection and lubricant with every hollow shaft gear unit. Use NOCO[®] Fluid when installing hollow shaft gear units. Using this fluid helps prevent contact corrosion and makes it easier to assemble the drive at a later date.

Furthermore, NOCO[®] Fluid is also suitable for protecting machined metal surfaces that do not have corrosion protection, including parts of shaft ends or flanges. You can order larger quantities of NOCO[®] Fluid from SEW-EURODRIVE.

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



2.3 Extended storage

Variant

You can also order gear units prepared for "extended storage." SEW-EURODRIVE recommends the "extended storage" type for storage periods longer than 9 months.

In this case, a VCI corrosion inhibitor (volatile corrosion inhibitor) is added to the lubricant in these gear units. Please note that this VCI corrosion inhibitor is only effective in a temperature range of -25 °C ... +50 °C. The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent. If not specified otherwise in your order, the gear unit will be supplied with OS1 surface protection. You can order OS2, OS3 or OS4 instead of OS1.

Surface protection	Suitable for
OS1	Low environmental impact
OS2	Medium environmental impact
OS3	High environmental impact
OS4	Very high environmental impact



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

Gear units will be supplied with an oil fill according to the mounting position (M1 ... M6) and are ready for operation. Check the oil level before you start operating the gear unit for the first time!

Storage conditions

Observe the storage conditions specified in the following table for extended storage:

Climate zone	Packaging ¹⁾	Storage location ²⁾	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	Under roof, protected against rain and snow, no shock loads.	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50 %).
	Open	Roofed, enclosed at constant temperature and atmospheric humidity (5 °C < 9 < 60 °C, < 50 % relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). Protected against aggressive vapors and shocks.	2 years or more with regular inspections. Check for cleanliness and mechanical damage during 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.	Under roof, protected against rain and shocks.	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50 %).
	Open	Roofed, enclosed at constant temperature and atmospheric humidity (5 °C < 9 < 50 °C, < 50 % relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). Protected against aggressive vapors and shocks. Protected against insect damage.	2 years or more with regular inspections. Check for cleanliness and mechanical damage during inspection. Check corrosion protection.

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

2) SEW-EURODRIVE recommends to store the gear units according to the mounting position.



2.4 Condition monitoring: Oil aging and vibration sensor

DUO10A diagnostics unit (Oil aging sensor)

Gear unit oil diagnostics through thermal analysis

The DUO10A diagnostic unit allows for diagnostic analysis as a means of preventive maintenance. The DUO10A diagnostic unit determines the individual, remaining service life of the oil based on the known service life curves and the oil temperature. The diagnostic unit consists of a temperature sensor and the actual evaluation unit. The remaining service life and the temperature of the oil can be read off via the display at the evaluation unit. The diagnostic unit is characterized by simple operation and user-friendly handling.

DUV10A diagnostics unit (vibration sensor)

Roller bearing diagnostics by means of vibration analysis

The DUV10A diagnostic unit monitors roller bearings, gearings for imbalance, and possible damages. Vibration analysis is used to detect possible damages at an early stage. This device allows for permanent vibration monitoring. The condition and development of the damage can be directly read on the device, or can be visualized externally using switch outputs.