5 Options and accessories

5.1 Torque arm /T

A torque arm is available as option for shaft-mounted gear units to support the reaction torque (for dimensions see page 314). The torque arm can bear tensile as well as pressure loads.

The length of the torque arm can be adjusted within a certain range.

The torque arm consists of a yoke with bolt [1], a threaded bolt [2], a maintenance-free joint head [3], and a yoke plate with bolt [4]. The design using the joint head allows for compensating assembly tolerances and operational displacements. Constraining forces on the output shaft are avoided in this way.

INFORMATION

Fan version X.K.. advanced cannot be used together with a torque arm because the fan guard is mounted to the attachment point of the torque arm.

To keep the bending moment on the machine shaft to a minimum, always mount the torque arm on the same side as the machine that is driven.

The torque arm can be mounted on the top or bottom of the gear unit.

INFORMATION

Fan version X.K.. advanced cannot be used together with a torque arm because the fan guard is mounted to the attachment point of the torque arm.
5.2 Mounting flange /F

As an alternative to foot mounting, a mounting flange is available for gear units up to size 210.

The standard is a B5 and B14 flange, which is fitted with external centering and retaining threads for connection to the customer machine.

INFORMATION

• The mounting flange can be combined with all output shaft types. The mounting flange cannot be used with the standard sealing system. Observe the limitations for hollow-shaft gear units in section "Gear unit mounting for hollow shaft gear units".

• With flange-mounted gear units, note the maximum permitted weight of the motor that can be mounted via a motor adapter. A combination of foot and flange mounting is not permitted!

• For dimensions of the mounting flange, see (page 316).
5.3 Flange couplings with cylindrical interference fit /FC

Flange couplings [1] are rigid couplings for connecting 2 shafts [2]. They are suitable for operation in both directions of rotation, but cannot compensate any shaft misalignments. Torque between the shaft and the coupling is transmitted via a cylindrical interference fit. Both coupling halves are mounted together at their flanges. The couplings are equipped with several disassembly bores [3] for disassembling the interference fit hydraulically.

INFORMATION

For more information on the flange coupling and dimensioning the machine shaft, see (page 318).
5.4 Motor adapter /MA

Motor adapters are available for mounting

- IEC (B5) motors of sizes 100 to 355
- NEMA ("C" face) motors of sizes 182 to 449

Observe the following notes:

INFORMATION

- The gear unit must be mounted in such a way that liquids cannot enter the motor adapter (HSS end) and accumulate there. Otherwise, the oil seal can be damaged, and subsequent damage can create a possible ignition source.
- An elastic claw coupling is included in the scope of delivery of the motor adapter.
- All motor adapters may be equipped with a fan for two-stage and three-stage gear units.
- For dimension sheets of the motor adapters, refer to (page 346).

The following figure shows an example of the motor adapter [1] connected to the gear unit:
5.4.1 Max. permitted motor weight

Two criteria are to be checked when mounting a motor onto the gear unit.

1. Maximum motor weight depending on gear unit version and type of mounting
2. Maximum motor weight depending on motor adapter size

INFORMATION

The motor weight may not exceed either one of these criteria.

1. Maximum motor weight depending on gear unit version and type of mounting

INFORMATION

• The following tables apply only to stationary applications. For mobile applications (e.g. travel drives), consult SEW-EURODRIVE.
• Contact SEW-EURODRIVE in case of deviating mounting position/mounting surface.

The following applies to all tables:

\( G_M = \text{Motor weight} \)

\( G_G = \text{Gear unit weight} \)

**Horizontal gear unit**

<table>
<thead>
<tr>
<th>Type of mounting</th>
<th>Mounting position M1 / mounting surface F1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X.F.</td>
</tr>
<tr>
<td>Foot-mounted design X../ B</td>
<td>( G_M \leq 1.5 \ G_G )</td>
</tr>
<tr>
<td>Shaft-mounted design X../ T</td>
<td>( G_M \leq 0.5 \ G_G )</td>
</tr>
<tr>
<td>Flange-mounted design X../ F</td>
<td>( G_M \leq 0.5 \ G_G )</td>
</tr>
</tbody>
</table>
2. Maximum motor weight depending on motor adapter size

The following maximum loads on the motor adapter may not be exceeded.

\[ G_M \] = Weight of the mounted motor
\[ X \] = Distance from the center of gravity

[1] Center of gravity of the motor

INFORMATION

The table only applies to stationary applications. For mobile applications (e.g. travel drives), consult SEW-EURODRIVE.

<table>
<thead>
<tr>
<th>Motor adapter</th>
<th>IEC</th>
<th>NEMA</th>
<th>( G_M ) [kg]</th>
<th>( X ) [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/112</td>
<td>182/184</td>
<td>60</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>213/215</td>
<td>110</td>
<td>230</td>
<td></td>
</tr>
<tr>
<td>160/180</td>
<td>254/286</td>
<td>220</td>
<td>310</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>324</td>
<td>280</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>326</td>
<td>400</td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>250 / 280</td>
<td>364 - 405</td>
<td>820</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>315S-L</td>
<td>444 - 449</td>
<td>1450</td>
<td>680</td>
<td></td>
</tr>
<tr>
<td>315</td>
<td></td>
<td>2000</td>
<td>740</td>
<td></td>
</tr>
<tr>
<td>355</td>
<td></td>
<td>2500</td>
<td>740</td>
<td></td>
</tr>
</tbody>
</table>

The maximum permitted weight \( G_M \) must be linearly reduced if the centroidal distance \( X \) is increased. \( G_M \) cannot be increased if the centroidal distance is reduced.
5.5  **V-belt drives /VBD**

V-belt drives are used wherever you need to adjust the total ratio or wherever the installation space requires a certain motor configuration.

The standard scope of delivery comprises motor scoop, belt pulleys, V-belt, and protective cover for the V-belt. As an alternative, the drive can be supplied as completely mounted unit with motor.

The following figures show the basic structure of a gear unit with V-belt drive.

**INFORMATION**

- In standard design, V-belt drives cannot be combined with a mounting flange or a fan as these options would collide with the V-belt drive.
- For dimensions of the V-belt drives, refer to (page 326). More sizes are available from SEW-EURODRIVE on request.
5.6 **Drive packages on a steel construction**

For gear units in a horizontal mounting position, complete preassembled drive packages on a steel frame (swing base or base frame) are available from SEW-EURODRIVE.

**INFORMATION**

The dimensions for the swing base and the base frame given on the dimension sheets on (page 468) are for information purposes only. Final dimensions are specified order-specifically by SEWEURODRIVE.

5.6.1 **Swing base /SB**

A swing base is a steel frame [1] that accommodates the gear unit, (hydro) coupling and motor (and brake, if required), including a protection device, such as a cover. A swing base is normally used for

- Hollow shaft gear units or
- Solid shaft gear units with flange coupling on the output shaft

The steel frame [1] is supported by a torque arm [2].

**INFORMATION**

Observe

- that the system frame is sufficiently dimensioned to absorb the torque
- that the swing base is not strained during installation (hazard of damage to gear unit and coupling)

Example: Swing base with coupling

![Swing base with coupling diagram](image-url)
5.6.2 Base frame /BF

A base frame is a steel frame [1] that accommodates the gear unit, coupling and motor (and brake, if required), including a protection device, such as a cover. The steel frame is supported by several foot mountings [2]. Such a frame is usually used for solid shaft gear units with elastic coupling on the output shaft.

**INFORMATION**

Observe

- that the support structure of the foot mounting is adequately dimensioned and rigid.
- that the base frame is not deformed during installation (hazard of damage to gear unit and coupling).

*Example: Base frame with coupling*

The following figure shows an example of a base frame with coupling.

![Base frame with coupling diagram]

[1] Base frame
[2] Foot mounting
[3] Bevel-helical gear unit
[4] Coupling with protection cover
5.7 **Backstop /BS**

**INFORMATION**

For information on the exact position, direction of rotation dependencies and dimensions of the backstop, see (page 319).

5.7.1 **Use**

The purpose of a backstop is to prevent undesirable directions of rotation. During operation, the backstop permits rotation in only one specified direction of rotation.

5.7.2 **Description**

The backstop operates with centrifugal lift-off sprags. Once the lift-off speed is reached, the sprags completely lift off from the contact surface of the outer ring. The backstop is lubricated with gear oil.

5.7.3 **Direction of rotation**

SEW-EURODRIVE installs backstops according to the specifications given with the order. It is absolutely necessary to specify the direction of rotation for the output shaft. The customer must check that the connected electric motor rotates in the correct direction. If not, the electric motor might damage the backstop.

The direction of rotation is specified as viewed onto the output shaft (LSS):

- **CW** = Clockwise
- **CCW** = Counterclockwise

The permitted direction of rotation [1] is indicated on the housing.

**INFORMATION**

If the drive has a continuous output shaft, the direction of rotation of the backstop should be given as viewed onto shaft position 3.
5.7.4 Dimensioning

The backstop is dimensioned according to the following basic rules:

- Speed of the input shaft of the gear unit: 0 – 1800 rpm
- Maximum permitted torque of the backstop in relation to the output shaft:
  At least 1.8 times the nominal gear unit torque except

<table>
<thead>
<tr>
<th>Gear unit size</th>
<th>Nominal gear unit ratio</th>
<th>Gear unit size</th>
<th>Nominal gear unit ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>X2F140</td>
<td>6.3 / 7</td>
<td>X3F260</td>
<td>20</td>
</tr>
<tr>
<td>X2F150</td>
<td>8 / 9</td>
<td>X3F270</td>
<td>22.4</td>
</tr>
<tr>
<td>X2F260</td>
<td>8</td>
<td>X3F280</td>
<td>25 / 28</td>
</tr>
<tr>
<td>X2F280</td>
<td>10</td>
<td>X3F300</td>
<td>56</td>
</tr>
<tr>
<td>X2K220</td>
<td>8 / 10</td>
<td>X4F120</td>
<td>100</td>
</tr>
<tr>
<td>X2K230</td>
<td>9 / 11.2 / 12.5</td>
<td>X4F130</td>
<td>125</td>
</tr>
<tr>
<td>X3F180</td>
<td>20</td>
<td>X4F290</td>
<td>100</td>
</tr>
<tr>
<td>X3F230</td>
<td>45</td>
<td>X4F300</td>
<td>112</td>
</tr>
</tbody>
</table>

Contact SEW-EURODRIVE for differing requirements.

The backstop might wear off when operated below lift-off speed.

In the following cases always contact SEW-EURODRIVE for specifying the maintenance intervals:

- Input speed rates $n_1 < 950$ rpm
- or any of the following gear unit designs:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>950 – 1150</td>
<td>X2K100 – 230 $i_N \geq 10$</td>
<td>100 – 130 $i_N \geq 31.5$</td>
<td>120 – 190 $i_N \geq 200$</td>
<td>120 – 170 $i_N \geq 200$</td>
</tr>
<tr>
<td>1150 – 1400</td>
<td>X100 – 130 $i_N \geq 25$</td>
<td>120 – 170 $i_N \geq 40$</td>
<td>120 – 170 $i_N \geq 200$</td>
<td>120 – 250 $i_N \geq 200$</td>
</tr>
<tr>
<td>&gt; 1400</td>
<td>X100 – 130 $i_N \geq 35.5$</td>
<td>140 – 250 $i_N \geq 200$</td>
<td>140 – 250 $i_N \geq 200$</td>
<td>140 – 250 $i_N \geq 200$</td>
</tr>
</tbody>
</table>

$n_1$ = Input speed (HSS)  
$i_N$ = Nominal gear unit ratio

**INFORMATION**

For information on torque limiting backstops, for example for dual drives, contact SEW-EURODRIVE.

5.8 Auxiliary drives

SEW-EURODRIVE gear units can also be delivered with an auxiliary drive (see separate publication "Bucket Elevator Drives" catalog). This is the standard configuration for 3-stage bevel-helical gear units in the gear ratio range from 28:1 to 80:1, and is mainly used for bucket conveyors. Other configurations are available on request.