



6 Project Planning for Optional Accessories

6.1 Mounting flange on output shaft

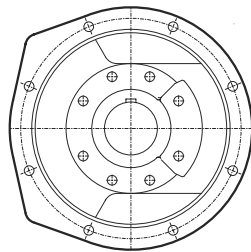
Usage

Gear units can be supplied with a mounting flange on the LSS. The mounting flange can basically be used for all three gear unit types:

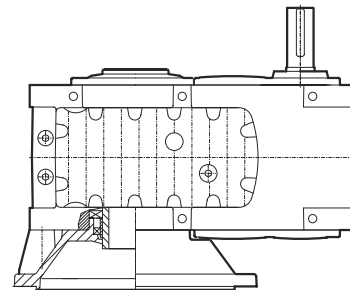
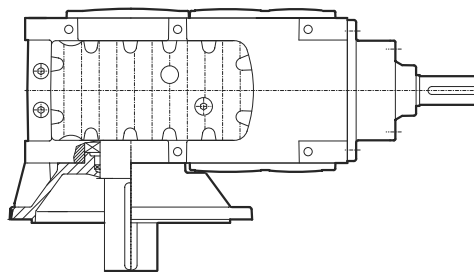
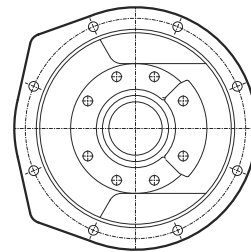
- Horizontal LSS (MC.L..)
- Vertical LSS (MC.V..)
- Upright mounting position (MC.E..)

Layout

Solid shaft LSS



Hollow shaft LSS



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Connection dimensions

The connection dimensions are shown as option "/MF" of the respective gear unit type in the section "Dimension drawing MC..."



With flange mounted gear units, observe the weight limitations of motors mounted to a motor adapter (→ section "Motor adapter").



Project Planning for Optional Accessories

Mounting flange on output shaft

Customer's counterflange specification

The counterflange must have the following characteristics:

- Stiff and torsionally rigid, taking into consideration
 - gear unit weight
 - motor weight
 - torque to be transmitted
 - additional forces from the customer machine acting on the gear unit (e.g. axial forces from and towards the gear unit resulting from a mixing process)
- Horizontal
- Plain
- Vibration isolating, which means that no vibrations are to be transmitted from close-by machines and elements
- No resonance vibrations must be created



The mounting surface of mounting flange and counter flange must be absolutely free of grease, oil, or other contaminants (such as small textile particles, dust, etc.)

The gear unit's LSS must be aligned as accurately as possible in relation to the counterflange. Alignment affects the lifetime of the bearing, shafts and coupling.

Following bolts of class 8.8 should be used:

MC...02..04 → M16

MC...05...07 → M20

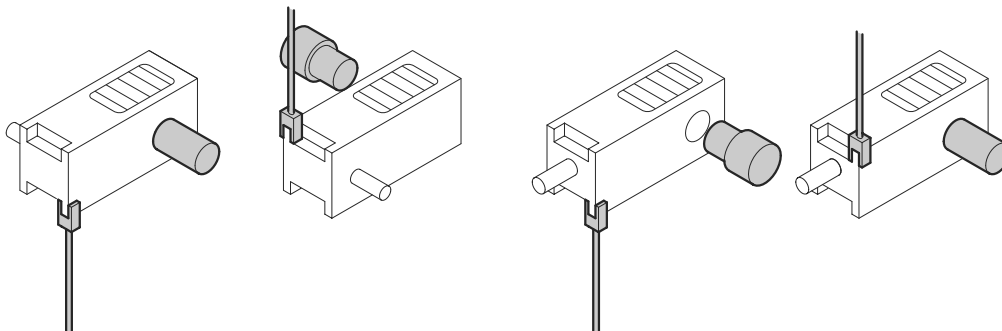
MC...08...09 → M24



6.2 Torque arm

Mounting options A torque arm is available as option to be mounted directly to the gear unit or the swing base.

Directly mounted to the gear unit Always mount the torque arm on the side of the driven machine.

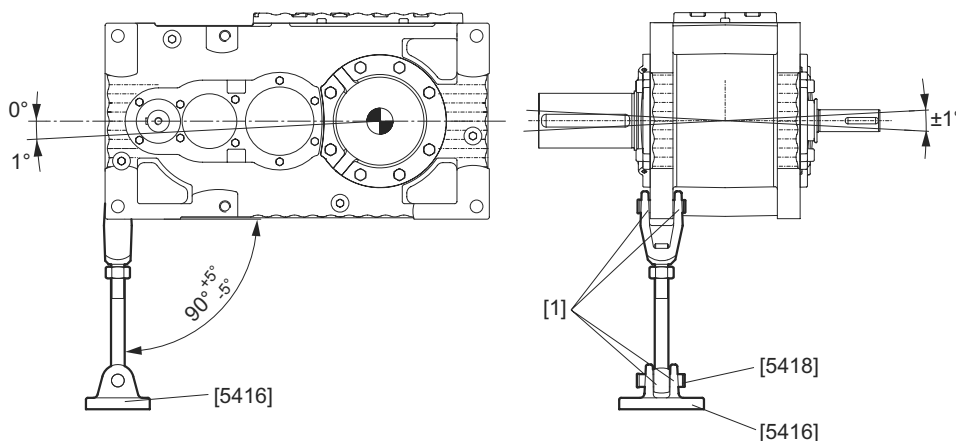


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The torque arm can be directly mounted to the gear unit to absorb tensile strain and compressive stress. Additional strain or stress to the gear unit may be caused by

- eccentricity during operation
- expansion of the driven machine due to heat.

To avoid such strain, the anchor bolt [5418] is equipped with double connection elements that allow for sufficient lateral and radial play [1].



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- [1] Sufficient play
- [5416] Retaining plate
- [5418] Anchor bolt



It is essential that there is sufficient play [1] between torque arm and retaining plate [5416] as well as between torque arm and gear unit. This way, no bending force can act on the torque arm and the bearings of the output shaft are not subjected to additional stress.

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



6.3 Backstop

Usage

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

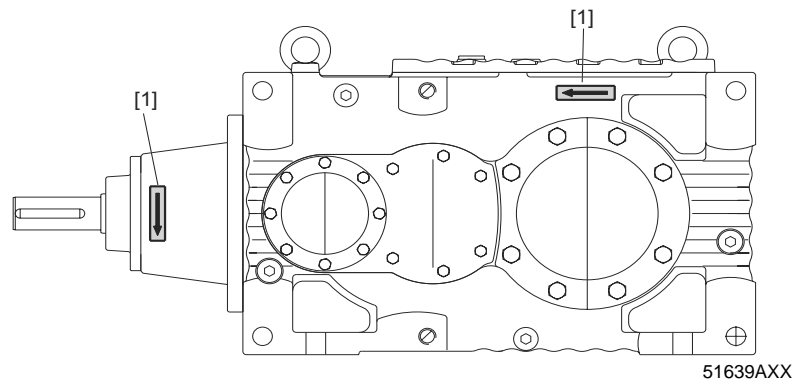
Description

The maintenance-free backstop is a centrifugally operated backstop with sprags that lift off. 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.

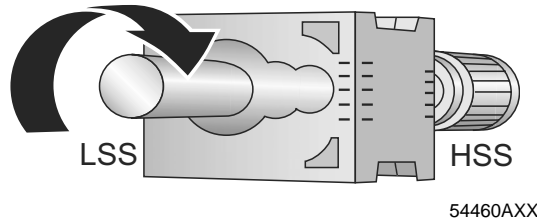
Direction of rotation

Backstops are mounted at SEW-EURODRIVE according to the specification. It is therefore important to specify the direction of rotation for the output shaft. It is also important for the customer to check that the connected electric motor rotates in the correct direction. If not, the peak torque of the electric motor may negatively influence the backstop.

The permitted direction of rotation is indicated on the housing.



Definition of the direction of rotation



The direction of rotation is specified as viewed onto the low speed shaft.

- Clockwise (CW)
- Counterclockwise (CCW)



Dimensioning

The size of the backstop is defined in such a way that the standard solution can be used for any application.

Basic rules for mechanical dimensioning

- Rotating speed of the gear unit's HSS: 0... 3000 rpm
- Maximum permitted torque of the backstop in relation to the output shaft: at least 1.8 times the nominal gear unit torque.

Design

- MC2P: 2-stage helical gear units. Backstop located at side of gear unit housing
- MC3P: 3-stage helical gear units. Backstop located inside gear unit housing.
- MC2R: 2-stage bevel-helical units. Backstop located at side of gear unit housing.
- MC3R: 3-stage bevel-helical gear units. Backstop located outside gear unit housing.

Shaft positions	Shaft positions			
	23	13 ¹⁾	24 ¹⁾	14
MC2P <ul style="list-style-type: none"> • Solid shaft • Hollow shaft with keyway • Hollow shaft with shrink disc 				
MC3P <ul style="list-style-type: none"> • Solid shaft • Hollow shaft with keyway • Hollow shaft with shrink disc 				

1) The maximum permitted external loads on the LSS are lower



	Shaft positions		Optional backstop and shaft position combinations	
	03	04	03 ¹⁾	04 ¹⁾
MC2R • Solid shaft				
MC2R • Hollow shaft with keyway				
MC3R²⁾ • Solid shaft • Hollow shaft with keyway • Hollow shaft with shrink disc				
MC2R • Hollow shaft with shrink disc				
MC3R³⁾ • Solid shaft • Hollow shaft with keyway • Hollow shaft with shrink disc				

1) The maximum permitted external loads on the LSS are lower

2) Position of backstop: Driven machine

3) Position of backstop: Opposite the driven machine



Check for inference of the backstop with the driven machine.



6.4 Sealing systems

MC.P.. helical gear units, seal arrangements for HSS

	Lip seal (standard) Single lip seal with dust protection cover • Clean environment	Double lip seal with grease nipple Double lip seal with regreaseable dust protection cover • Dusty environment with abrasive particles	Radial labyrinth seal with grease nipple Single lip seal with radial grease labyrinth Dusty environment with abrasive particles
Horizontal HSS			
Vertical HSS upwards			
Vertical HSS downwards			



MC.R.. bevel-helical gear units, seal arrangements for HSS

	<p>Lip seal (standard)</p> <p>Single lip seal with dust protection cover</p> <ul style="list-style-type: none"> Clean environment 	<p>Double lip seal with grease nipple</p> <p>Double lip seal with regreaseable dust protection cover</p> <ul style="list-style-type: none"> Dusty environment with abrasive particles 	<p>Radial labyrinth seal with grease nipple</p> <p>Single lip seal with radial grease labyrinth</p> <ul style="list-style-type: none"> Dusty environment with abrasive particle
<p>Horizontal HSS</p>			
<p>Vertical HSS upwards</p>			
<p>Vertical HSS downwards</p>			



MC.P., MC.R., seal arrangements for solid LSS

	Lip seal (standard) Single lip seal with dust protection cover • Clean environment	Double lip seal with grease nipple Double lip seal with regreaseable dust protection cover • Dusty environment with abrasive particles	Radial labyrinth seal with grease nipple Single lip seal with radial grease labyrinth • Dusty environment with abrasive particles
Horizontal HSS			
Vertical HSS upwards			
Vertical HSS downwards			

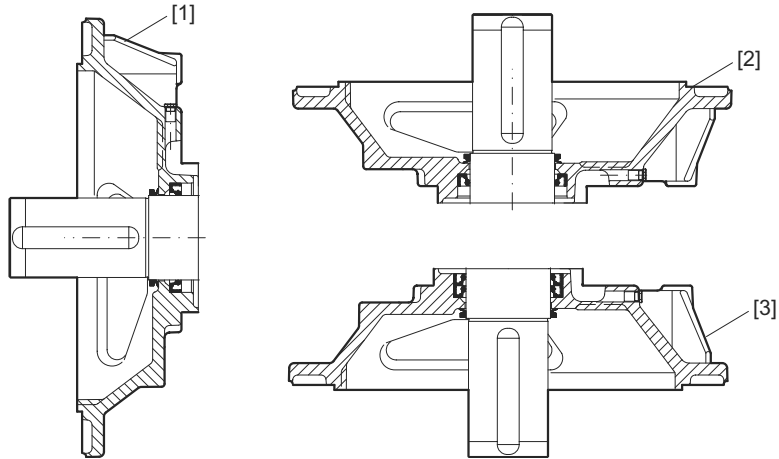


MC.P., MC.R., seal arrangements for hollow LSS

	Lip seal (standard) Single lip seal with dust protection cover • Clean environment	Double lip seal with grease nipple Double lip seal with regreaseable dust protection cover • Dusty environment with abrasive particles	Radial labyrinth seal with grease nipple Single lip seal with radial grease labyrinth • Dusty environment with abrasive particles
Horizontal HSS			
Vertical HSS upwards			
Vertical HSS downwards			



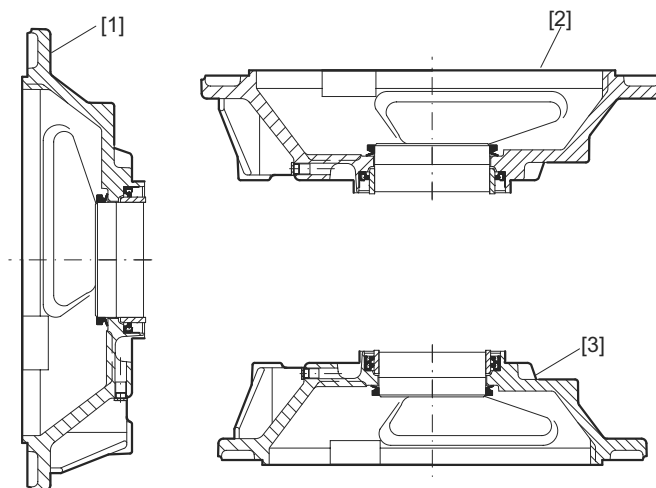
**MC.P., MC.R..
with mounting
flange ("MF"),
solid LSS**



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Sealing solution	Gear unit design	Shaft position	Drawing number
Single lip seal (NBR) with dust protection cover and V-ring (NBR)	Horizontal LSS	All	1
	Upright mounting position	All	1
	Vertical LSS	14, 24, 04	2
Double lip seal (NBR) with dust protection cover and V-ring (NBR)	Vertical LSS	13, 23, 03	3

**MC.P., MC.R..
with mounting
flange ("MF"),
hollow LSS**



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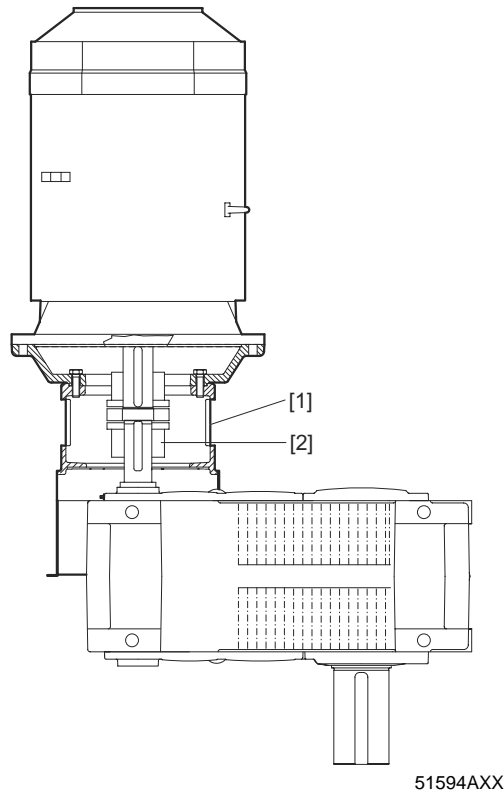
Sealing solution	Mounting position	Shaft positions	Drawing number
Single lip seal (NBR) with dust protection cover and V-ring (NBR)	Horizontal LSS	All	1
	Upright mounting	All	1
	Vertical LSS	14, 24, 04	2
Double lip seal (NBR) with dust protection cover and V-ring (NBR)	Vertical LSS	13, 23, 03	3



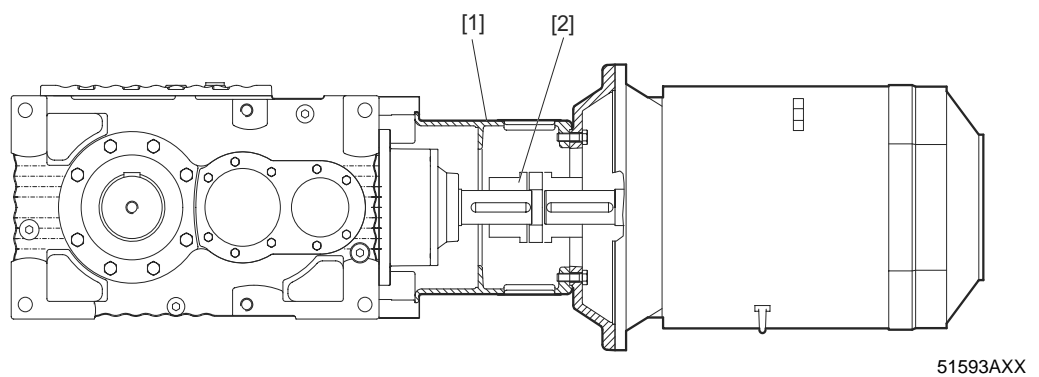
6.5 Motor adapters

Motor adapters [1] are available for mounting

- IEC motor sizes 132 to 315
- NEMA motor sizes 213 to 505



- [1] Motor adapter
[2] Coupling



- [1] Motor adapter
[2] Coupling



The connection dimensions are shown in the section "Dimension drawings for motor adapters."





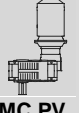
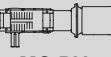
When selecting a motor, **take into account the permitted motor weight, gear unit design and gear unit mounting type** according to the following tables:



The following applies to all tables:

G_M = Motor weight

G_G = Gear unit weight

Mounting type	Type / gear unit design	
	 MC.PL..	 MC.RL..
Foot mounted	$G_M \leq G_G$	$G_M \leq G_G$
Shaft mounted	$G_M \leq 0.5G_G$	$G_M \leq G_G$
Flange mounted	$G_M \leq 0.5G_G$	$G_M \leq G_G$

Mounting type	Type / gear unit design	
	 MC.PV..	 MC.RV..
Foot mounted	$G_M \leq 1.5G_G$	$G_M \leq G_G$
Shaft mounted	$G_M \leq G_G$	$G_M \leq G_G$
Flange mounted	$G_M \leq G_G$	$G_M \leq 0.75G_G$

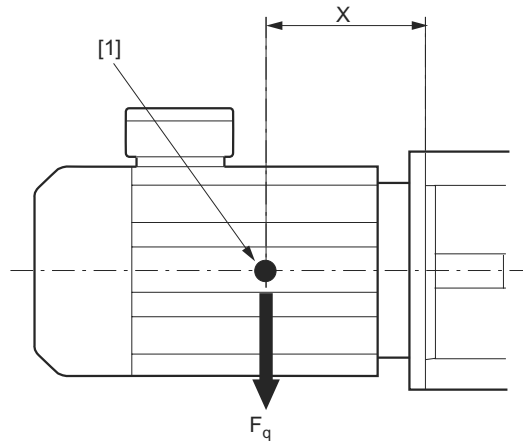
Mounting type	Type / gear unit design	
	 MC.PE..	 MC.RE..
Foot mounted	$G_M \leq G_G$	$G_M \leq 1.5G_G$
Shaft mounted	$G_M \leq G_G$	$G_M \leq G_G$
Flange mounted	$G_M \leq G_G$	$G_M \leq G_G$



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



These tables only apply to the following correlation of motor size/weight F_q and dimension "x".



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[1] Center of gravity of the motor

Motor size		F_q [N]	x [mm]
IEC	NEMA		
132S	213/215	579	189
132M	213/215	677	208
160M	254/286	1059	235
160L	254/286	1275	281
180M	254/286	1619	305
180L	254/286	1766	305
200L	324	2354	333
225S	365	2943	348
225M	365	3237	348
250M	405	4267	395
280S	444	5984	433
280M	445	6475	433
315S	505	8142	485
315M	505	8927	485
315L		11772	555

The maximum approved weight of the attached motor F_q has to be reduced in a linear manner if the center of gravity distance x is increased. $F_{q \max}$ cannot be increased if the center of gravity distance is reduced.



Contact SEW-EURODRIVE in the following cases:

- If you want to retrofit motor adapters with a cooling fan (not for motor sizes 132S and 132M).



6.6 Steel frame (swing base, base plate)

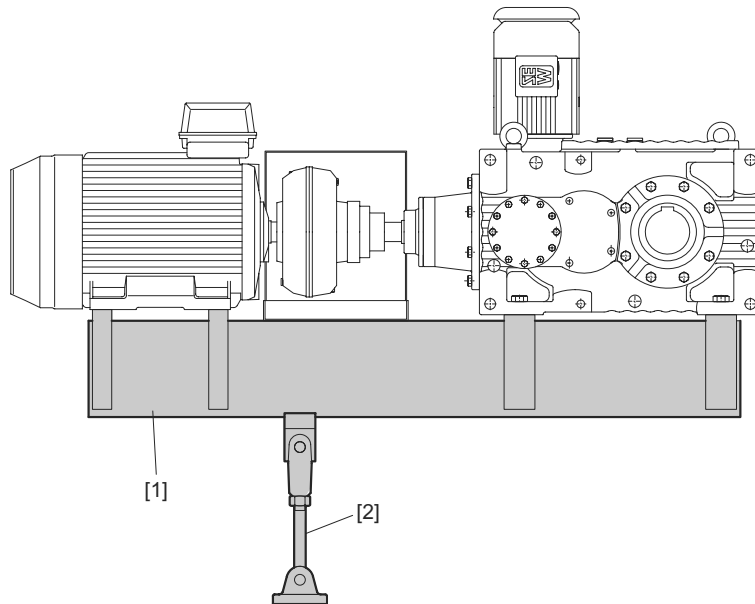
For industrial gear units of the MC series in horizontal mounting position (MC2PL..., MC3PL..., MC2RL..., MC3RL...), SEW-EURODRIVE supplies preassembled drive packages on a steel frame (swing base or base frame).

Swing base

A swing base is a steel frame [1] that accommodates gear unit, (fluid) coupling and motor (and brake, if required) such as

- hollow shaft gear unit or
- solid shaft gear unit with flange coupling on the output shaft

The swing base [1] is supported by a torque arm [2] (→ section "Torque arm").



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[1] Swing base

[2] Torque arm



It is essential that

- the system is dimensioned in such a way that the torque of the torque arm can be absorbed (→ section "Gear unit foundation")
- the swing base is not deformed during installation (hazard of damage to the gear unit and coupling)

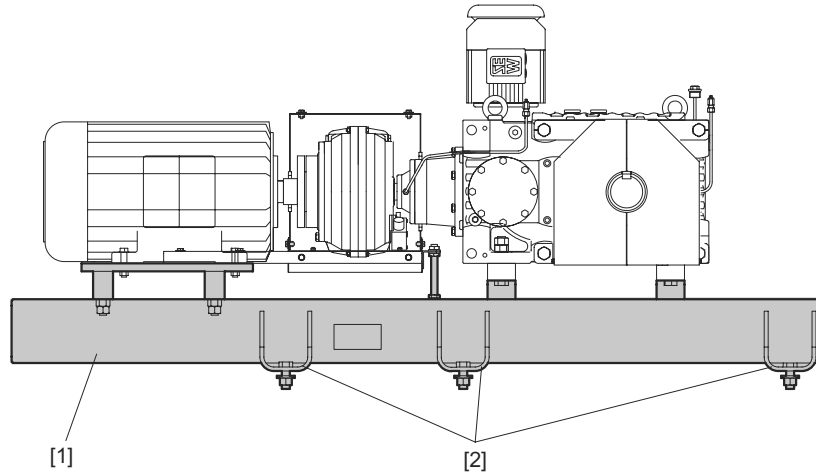


Project Planning for Optional Accessories

Steel frame (swing base, base plate)

Base frame

A base frame is a steel frame [1] that accommodates gear unit, (fluid) coupling and motor (and brake, if required). 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.



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- [1] Base frame
[2] Foot mounting



It is essential that

- the support structure of the foot mounting is adequately dimensioned and rigid (→ section "Gear unit foundation")
- the base frame is not deformed through incorrect alignment (hazard of damage to the gear unit and coupling).



6.7 Motor bracket and V-belt drive

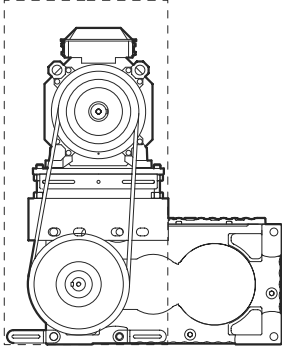
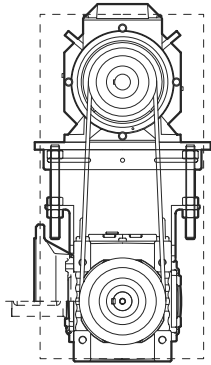
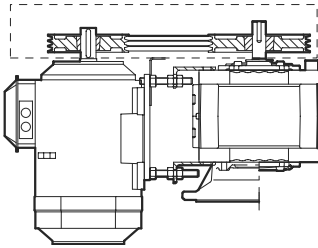
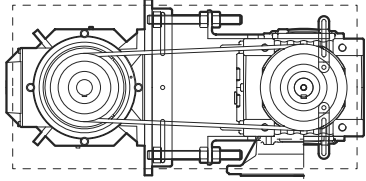
A V-belt drive is used when the overall gear ratio needs to be adjusted. The standard scope of delivery includes motor bracket, belt pulleys, V-belts and belt guard.



Observe the permitted weight for motor and gear unit specified in the following table:

G_M = Motor weight

G_G = Gear unit weight

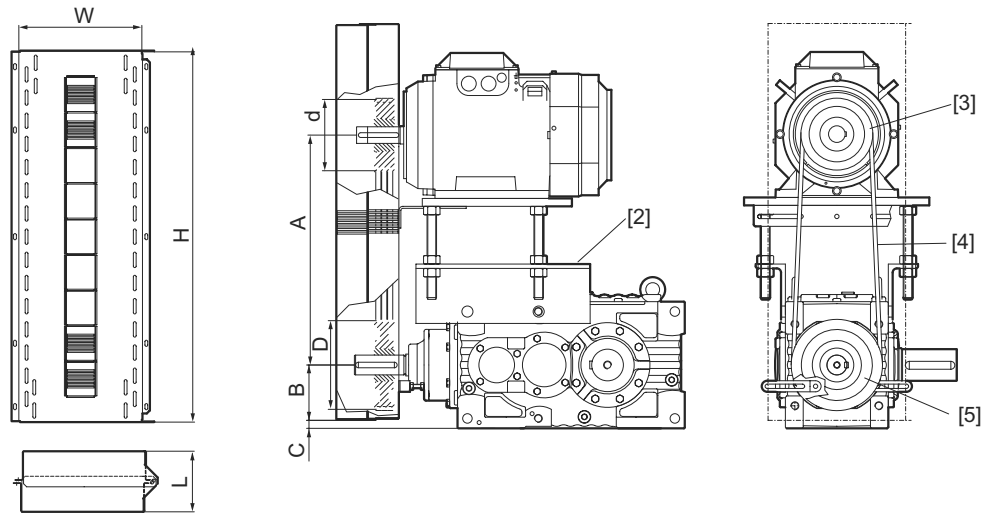
	MC2P/MC3P	MC2R/MC3R
<p>Upright mounting:</p> <p>Foot mounted $G_M \leq 0.4 \times G_G$</p> <p>Shaft mounted $G_M \leq 0.4 \times G_G$</p> <p>Flange mounted $G_M \leq 0.4 \times G_G$</p>	<p>Contact SEW-EURODRIVE</p>	<p>Contact SEW-EURODRIVE</p>
<p>Horizontal LSS mounting:</p> <p>Foot mounted $G_M \leq 1.0 \times G_G$</p> <p>Shaft mounted $G_M \leq 1.0 \times G_G$</p> <p>Flange mounted $G_M \leq G_G$</p>	 <p>54046AXX</p>	 <p>54047AXX</p>
<p>Vertical LSS mounting:</p> <p>Foot mounted $G_M \leq 0.4 \times G_G$</p> <p>Shaft mounted $G_M \leq 0.4 \times G_G$</p> <p>Flange mounted $G_M \leq G_G$</p>	 <p>54052AXX</p>	 <p>54053AXX</p>



Project Planning for Optional Accessories

Motor bracket and V-belt drive

The V-belt guard is provided with hinges and slots for stroboscope checking



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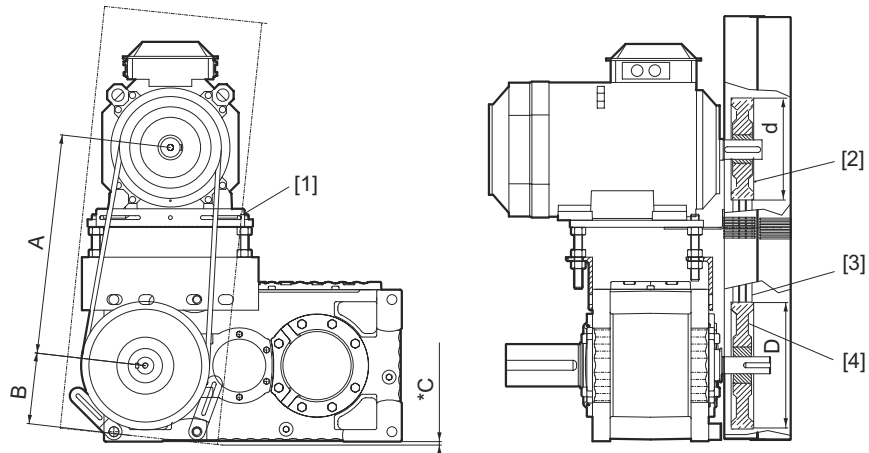
The scope of delivery of the belt drive includes:

- Belt guard [1]
- Motor bracket [2]
- Pulley with taper bushing [3]
- V-belts [4]
- Pulley with taper bushing [5]

	W	H [mm]	L
VBC1	300	1000	160
VBC2	400	1200	190
VBC3	500	1200	220
VBC4	500	1400	220
VBC5	600	1400	220
VBC6	650	1650	220



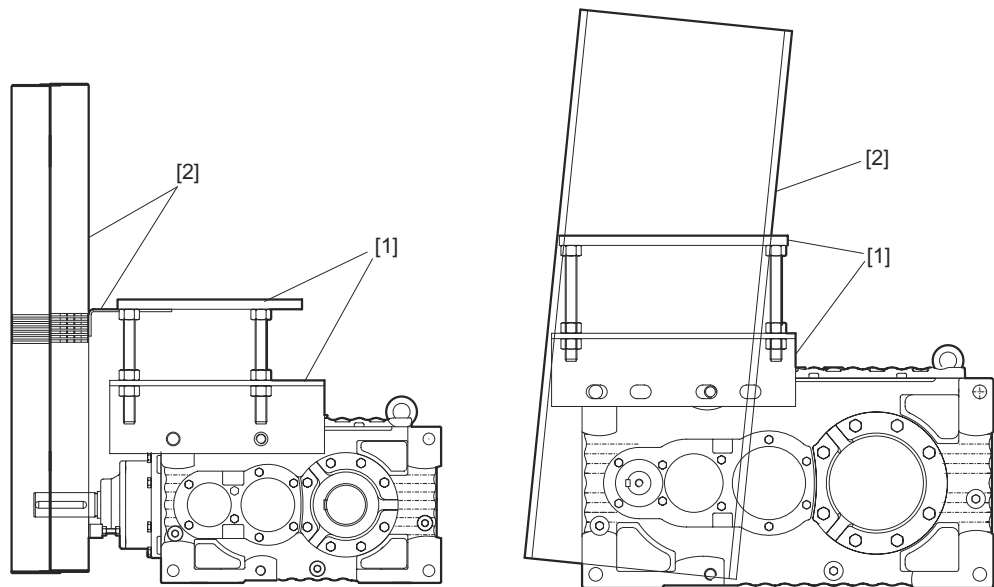
If the edge of the V-belt guard is placed below the foot line of the gear unit, then dimension *C is negative.



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- [1] Motor bracket
- [2] Pulley with taper bushing
- [3] V-belt
- [4] Pulley with taper bushing

The V-belt drive can also be delivered without V-belts, pulleys and motor. The motor bracket delivery only includes the bracket [1], the belt guard [2] can be included as optional feature.



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- [1] Motor bracket
- [2] Belt guard and fastening plates

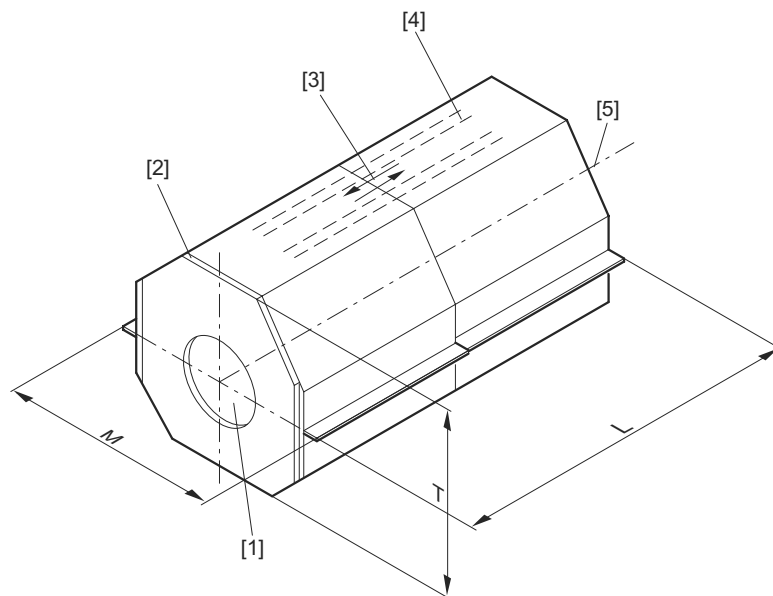


6.8 Coupling guard

The coupling guard for the input shaft coupling can be used with or without cooling fan.

The coupling guard is directly attached to the bearing cover of the gear unit. No extra support is required for the coupling guard. The guard design complies with **European safety regulations**.

Guard size	Max. coupling diameter	Length L	Max. shaft \varnothing of driving / driven shaft [mm]	Height T	Width W
1	140	138 - 189	65	160	216
2	140	190 - 293	65	160	216
3	230	190 - 293	105	250	306
4	230	297 - 482	105	250	306
5	290	297 - 482	105	310	408
6	360	297 - 482	145	380	436
7	470	483 - 829	205	490	546
8	570	483 - 829	205	590	646

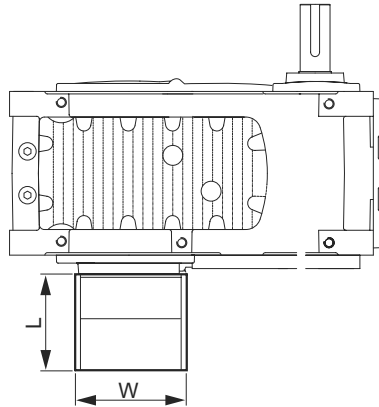


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- [1] Gear unit shaft (LSS, HSS)
- [2] Flange for mounting to gear unit
- [3] Adjustable length
- [4] Cooling vents
- [5] Driving / driven machine

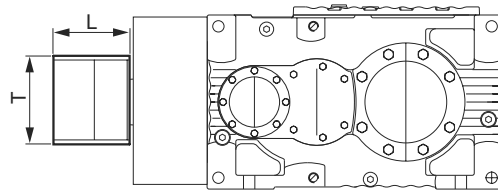


LSS
coupling guard



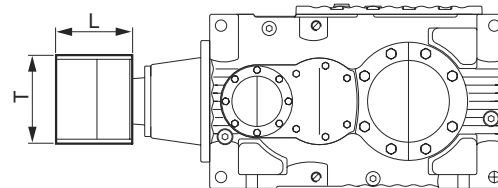
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HSS
coupling guard
MC..R gear unit
with fan



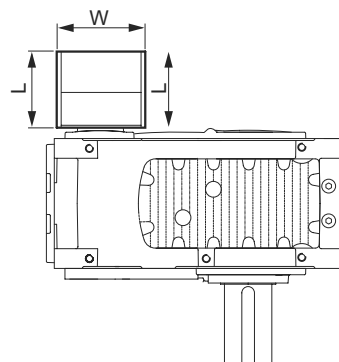
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MC..R gear unit
without fan



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MC..P gear unit



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