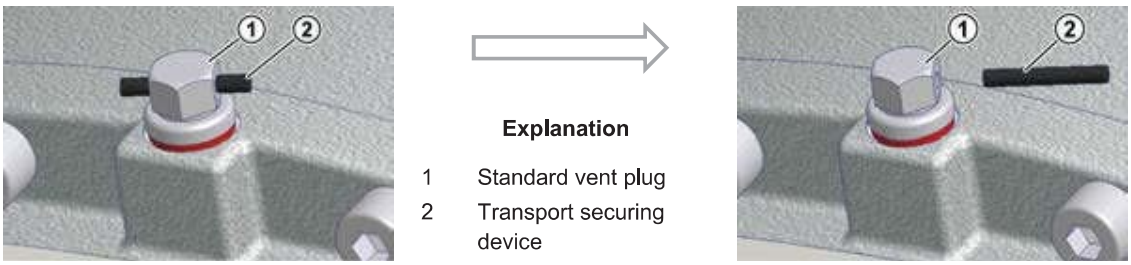


Figure 2: Activating the vent plug

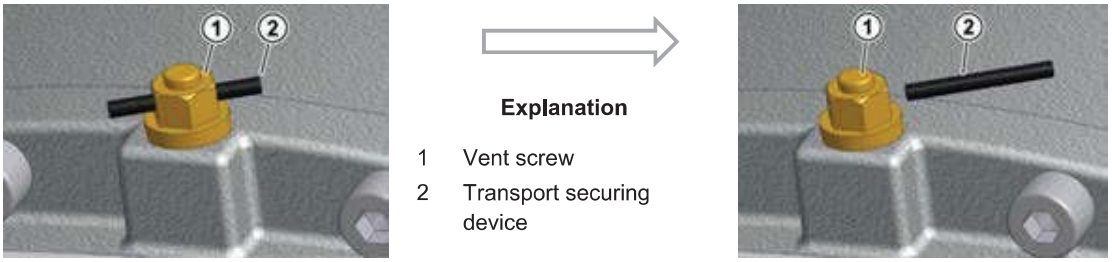


Figure 3: Activating the vent plug

Before commissioning, the vent plug must be replaced with the special pressure vent which is supplied as a loose part.

This is done by unscrewing the vent fitting and replacing it with the special pressure vent and seal (refer to Section 6.1 "Configurations and maintenance"). Double gear units consist of two single units and are equipped with 2 oil chambers and 2 pressure vents.

Figure 4: Removing the vent plug and fitting the special pressure vent

(please see chapter 6.5 "Torque values")

3.5 Installing the gear unit

⚠ WARNING — **Danger of burns**

The surfaces of gear units or geared motors may become hot during or shortly after operation.

Hot surfaces which can be touched directly must be protected with a contact guard.

⚠ WARNING — **Danger to persons**

If the foundation or the fastening of the gear unit is not adequately dimensioned, the gear unit may detach, fall down or rotate in an uncontrolled manner.

The foundation and the gear unit fastening must be appropriately designed for the weight and the torque. All bolts must be used to fasten the gear unit

NOTICE — **Damage to the gear unit due to overheating**

The gear unit may be damaged by overheating.

When installing, check that the cooling air from the motor fan can circulate around the geared motor and the gear unit without obstruction.

The eyebolts screwed into the gear units must be used during installation. No additional load may be attached to the gear unit.

If geared motors have an additional eyebolt attached to the motor, this must also be used. Avoid pulling the eyebolts at an angle. Observe the safety information (please see chapter 1.4 "Safety information").

The base and/or flange to which the gear unit is fitted should be vibration-free, torsionally strong and flat. The smoothness of the mating surface on the base or flange must be according to tolerance class K according to DIN ISO 2768-2. All contamination to the bolting surfaces of gear unit and base and/or flange must be thoroughly removed.

The gear housing must always be earthed. With geared motors, earthing via the motor connection must be ensured.

The gear unit must be precisely aligned with the drive shaft of the machine in order to prevent additional forces from being imposed on the gear unit due to distortion.

Welding of the gear unit is prohibited. The gear unit must not be used as the earth connection for welding work, as this may cause damage to the bearings and gear wheels.

The gear unit must be installed in the correct orientation(please see chapter 6.1 "Configurations and maintenance"). (UNIVERSAL SI and SM gear unit types do not depend on the configuration). Changes to the installation position after delivery require adjustment of the quantity of oil, and often other measures such as e.g. the installation of encapsulated roller bearings. **Damage may result if the stated installation position is not observed.**

All gear unit feet and/or all flange bolts on each side must be used. Bolts must have a minimum quality of 8.8. The bolts must be tightened to the correct torques (please see chapter 6.5 "Torque values"). Tension-free bolting must be ensured, particularly for gear units with a foot and flange.

The oil inspection screws, oil drain screws and the vent valves must be accessible.

3.6 Fitting hubs on the gear shafts

NOTICE — **Gear unit damage**

The gear unit may be damaged by axial forces.

Do not subject the gear unit to harmful axial forces when fitting the hubs. In particular, do not hit the hubs with a hammer.

Drive and driven elements, e.g. coupling and chain-wheel hubs must be mounted onto the drive and driven shaft of the gear unit using suitable pullers that will not apply damaging axial forces onto the gear unit.

Information — **Installation**

Use the end thread of the shafts for pulling. Fitting can be aided by coating the hub with lubricant or heating it up to approx. 100 °C beforehand.

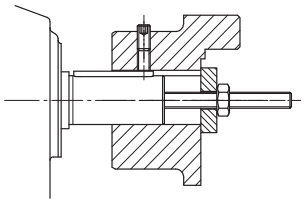


Figure 5: Example of a simple pulling device

DANGER — **Severe personal injury**

There is a danger of injury due to rapidly rotating drive and driven elements.

Drive and driven elements, such as belt drives, chain drives, shrink disks, fans and couplings must be fitted with contact protection.

Drive and driven elements may only subject the drive unit to the maximum radial forces F_R and axial forces F_A which are specified in the catalogue. Observe the correct tension, particularly on belts and chains.

Additional loads due to unbalanced hubs are not permitted.

The transverse force must be applied to the gear unit as closely as possible.

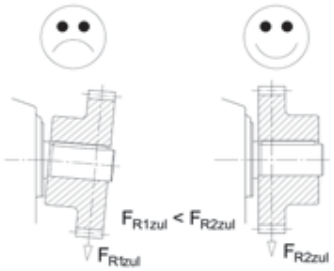


Figure 6: Correct assembly of drive elements

3.7 Fitting push-on gear units

NOTICE — **Gear unit damage**

The bearings, gear wheels, shafts and housing may be damaged by incorrect fitting.

- Observe the assembly instructions.
- The push-on gear unit must be fitted onto the shaft using a suitable puller, which will not exert damaging axial forces on the gear unit. In particular, do not hit the gear unit with a hammer.

Assembly and subsequent dismantling is aided by applying an anti-corrosive lubricant to the shaft before fitting (e.g. NORD Anti-Corrosion Part No. 089 00099). Excess grease or anti-corrosion agent may escape after assembly and may drip off. Clean these points on the output shaft after a running-in time of approx. 24 hours. This escape of grease is not due to a leak in the gear unit.

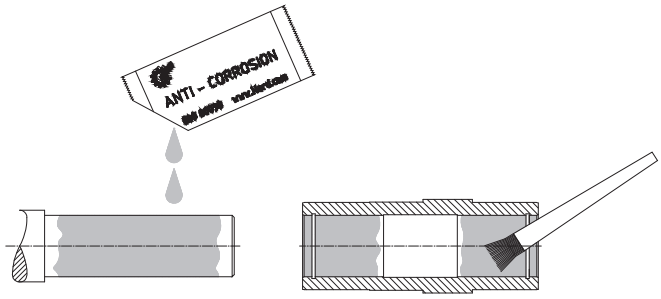


Figure 7: Applying lubricant to the shaft and the hub

Information — **Fastening element**

The gear unit can be fitted to shafts with and without a shoulder using the fastening element (Option B). Tighten the bolt of the fastening element to the correct torque (please see chapter 6.5 "Torque values"). For gear units with option H66, the factory-fitted closing cap must be removed before assembly.

For push-on gear units with option H66 and fastening element (Option B) the pressed-in closing cap must be pushed out before fitting the gear unit. The pressed-in closing cap may be destroyed during dismantling. As standard a second closing cap is supplied as a loose spare part. After fitting the gear unit, fit the new / new condition closing cap as described in Section 3.9 "Fitting the covers".

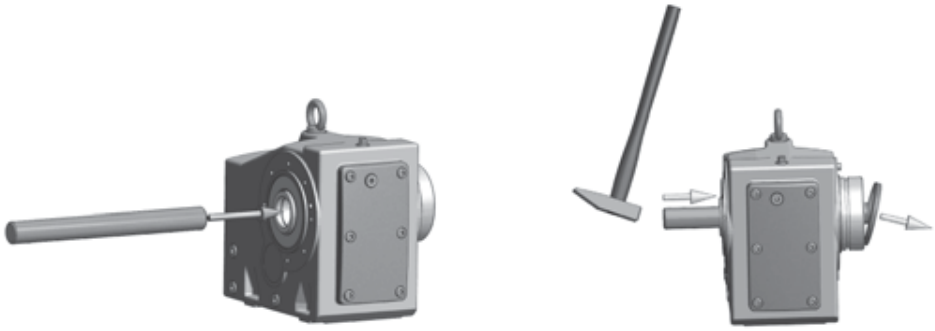


Figure 8: Removing the factory-fitted closing cap

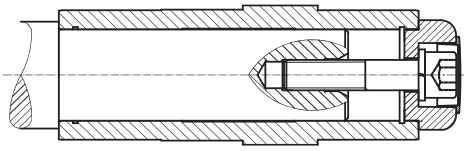


Figure 9: Gear unit mounted to shaft with a shoulder using the fastening element

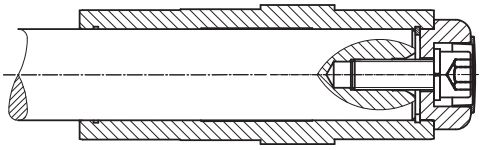


Figure 10: Gear unit mounted to shaft without a shoulder using the fastening element

A gear unit can be dismantled from a shaft with a shoulder using the following device, for example.

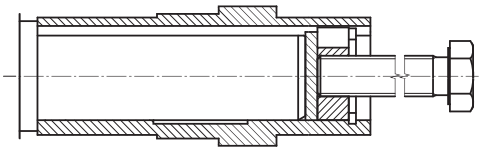


Figure 11: Dismantling using dismantling device

When assembling push-on gears with torque supports, the support must not be distorted. Tension-free mounting is aided by the rubber buffer (Option G or VG).

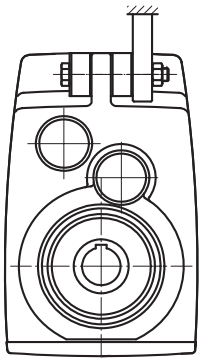


Figure 12: Mounting the rubber buffer (Option G or VG) on parallel shaft gear units

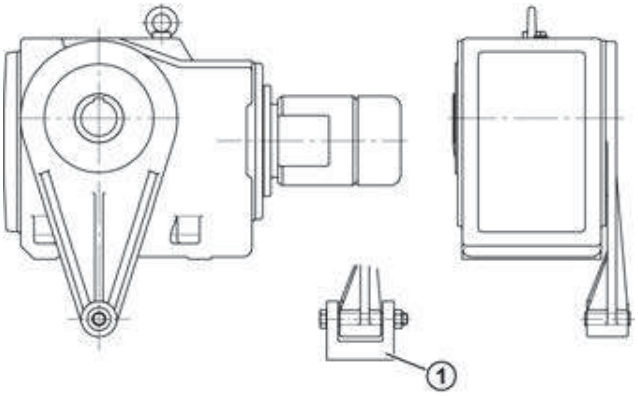
To fit the rubber buffer, tighten the screw fastening until there is no play between the contact surfaces when there is no load.

Then turn the fastening nut half a turn in order to pre-tension the rubber buffer (only applies for screw fastenings with adjusting threads). Greater pre-tension is not permissible

WARNING — **Risk of injury**

The gear unit may suddenly rotate around the shaft if the bolts are loosened.

Secure the screw fastening against loosening, e.g. with Loctite 242 or a second nut.



	Explanation
1	Always support torque support on both sides

Fig. 13: Attaching the torque support on bevel gear and worm gear units

Tighten the fastenings of the torque support with the correct tightening torques (please see chapter 6.5 "Torque values") and secure against loosening (e.g. Loctite 242, Loxeal 54-03).

3.8 Fitting shrink discs

⚠ CAUTION — **Risk of injury**

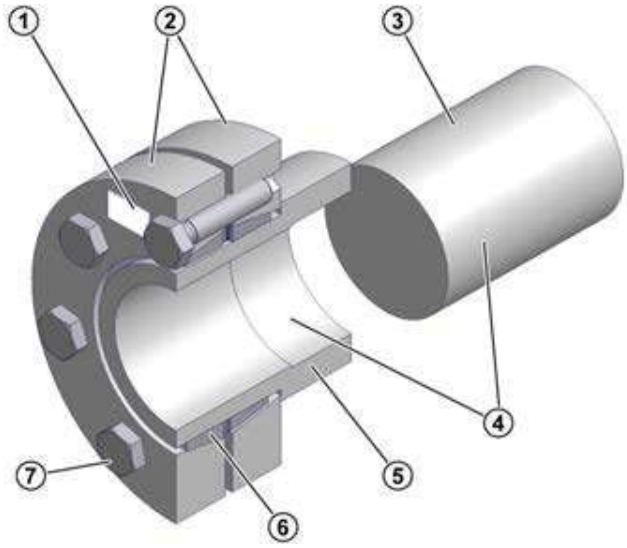
Risk of injury from incorrect mounting and dismantling of the shrink disc.

Observe the instructions.

NOTICE — **Gear unit damage**

If the tensioning bolts are tightened without the solid shaft inserted, the hollow shaft may be permanently deformed.

Do not tighten bolts if the solid shaft is not inserted!



Explanation

1 Shrink disc, type, part no. and torque details for tensioning screws
2 Tensioning flanges
3 Solid shaft of machine
4 Shaft and hollow shaft bore **FREE OF GREASE**
5 Hollow shaft of gear unit
6 Double half-slotted inner ring
7 Tensioning screws DIN 931 (933) -10.9

Figure 14: Hollow shaft with shrink disc

The shrink discs are supplied by the manufacturer ready for fitting. They must not be dismantled prior to fitting.

The solid shaft of the machine runs **free of grease** in the hollow shaft of the gear unit.

Assembly sequence

1. Remove any transport securing devices.
2. Loosen but do not remove tightening bolt and tighten gently by hand until there is no play between the flanges and the inner ring.
3. Slide the shrink disc onto the hollow shaft until the outer clamping flange is flush with the hollow shaft. The shrink disc is easier to slide on if the bore of the inner ring is lightly greased.
4. Prior to mounting, grease the solid shaft only in the area which will later come into contact with the bronze bush in the hollow shaft of the gear unit. Do not grease the bronze bush, in order to prevent grease penetrating the area around the shrink connection.
5. The hollow shaft of the gear unit must be completely de-greased and **completely free of grease.**
6. In the area of the shrink connection the solid shaft of the machine must be degreased and **completely free** of grease.
7. Insert the solid shaft of the machine into the hollow shaft so as to completely fill the area around the shrink connection.
8. Position the clamping flange by gently tightening the bolts.
9. Tighten the tensioning bolts successively in a clockwise direction by several turns – not crosswise – with approx. ¼ rotation per turn. Tighten the bolts with a torque wrench to the torque indicated on the shrink disc.
10. When the tensioning bolts have been tightened, there must be an even gap between the clamping flanges. If this is not the case, the gear unit must be dismantled and the shrink disc connection checked for correct fit.

Dismantling sequence:

1. Loosen the tensioning bolts successively in a clockwise direction by several turns with approx. ¼ rotation per turn. Do not remove the bolts from their thread.
2. Loosen the clamping flanges from the cone of the inner ring.
3. Remove the gear unit from the solid shaft of the machine.

If a shrink disk has been in use for a long period or is dirty, it must be dismantled, cleaned and the conical surfaces coated with Molykote G Rapid Plus or a similar lubricant before it is refitted. The threads and head surfaces of the screws must be treated with grease without Molykote. Any damaged or corroded elements must be replaced.

3.9 Fitting the covers

WARNING — **Risk of injury**

There is a danger of injury due to shrink discs and freely rotating shaft journals.

- Use a cover (Option H and Option H66) as a guard.
- If this does not achieve sufficient protection against contact according to the required protection type, the machinery and plant constructor must ensure this by means of special attached components.

All fixing screws must be used and tightened to the correct torque (please see chapter 6.5 "Torque values"). For covers with Option H66, press in the new / new condition closing cap by tapping it lightly with a hammer.

Figure 15: Fitting the covers, Option SH, Option H, and Option H66

3.10 Fitting the covers

WARNING — **Risk of injury**

There is a danger of injury due to freely rotating shaft journals.

- Use a cover cap as a guard
- If this does not achieve sufficient protection against contact according to the required protection type, the machinery and plant constructor must ensure this by means of special attached components.

Many versions of the universal worm gear unit are supplied with plastic cover caps as standard. These cover caps protect the shaft sealing ring against the entry of dust and other possible contamination. The cover caps can be removed by hand without the use of tools and pushed onto the A or B side.

The cover cap must be removed before installing the universal worm gear unit. After installation is complete, the cover cap must be pushed into the threaded holes on the output flange on the corresponding side. Care must be taken that the cover cap is removed and pushed on vertically, in order not to damage the expansion elements of the cover cap.

Fig. 16: Removal and fitting of the cover cap

3.11 Fitting a standard motor

The maximum permitted motor weights indicated in the table below must not be exceeded when attaching the motor to an IEC/NEMA adapter:

Maximum permitted motor weights														
IEC motor size	63	71	80	90	100	112	132	160	180	200	225	250	280	315
NEMA motor size		56C	143T	145T	182T	184T	210T	250T	280T	324T	326T	365T		
Max. motor weight [kg]	25	30	40	50	60	80	100	200	250	350	500	700	1000	1500

WARNING **Risk of injury**

Severe injuries may be caused by rapidly rotating parts when installing and servicing couplings.

Secure the drive unit against accidental switch-on.

Assembly procedure to attach a standard motor to the IEC adapter (Option IEC/NEMA adapter)

1. Clean the motor shaft and flange surfaces of the motor and the IEC /NEMA adapter and check for damage. The mounting dimensions and tolerances of the motor must conform to DIN EN 50347/NEMA MG1 Part 4.
2. Push the coupling sleeve onto the motor shaft so that the motor parallel key engages into the groove in the sleeve on tightening.
3. Tighten the coupling sleeve on the motor shaft in accordance with the motor manufacturer's instructions until it touches the collar. With motor sizes 90, 160, 180 and 225, any spacer bushes must be positioned between the coupling sleeve and the collar. With standard helical gear units, dimension B between the coupling sleeve and the collar must be observed (see Figure 17). Certain NEMA adapters require adjustment of the coupling in accordance with the specifications indicated on the adhesive plate.
4. If the coupling half contains a threaded pin, the coupling must be secured axially on the shaft. The threaded pin must be coated prior to use with a securing lubricant e.g. Loctite 242, Loxeal 54-03 and tightened to the correct torque (please see chapter 6.5 "Torque values").

.

5. Sealing of the flange surfaces of the motor and the IEC/NEMA adapter is recommended if the motor is installed outdoors or in a humid environment. Before the motor is installed, the flange surfaces must be completely coated with surface sealant Loctite 574 or Loxeal 58-14 so that the flange seals after mounting.
6. Mount the motor on the IEC/NEMA adapter. Do not forget to fit the gear rim or the splined sleeve provided (see illustration below).
7. Tighten the bolts of the IEC/NEMA adapter with the correct torque (please see chapter 6.5 "Torque values").

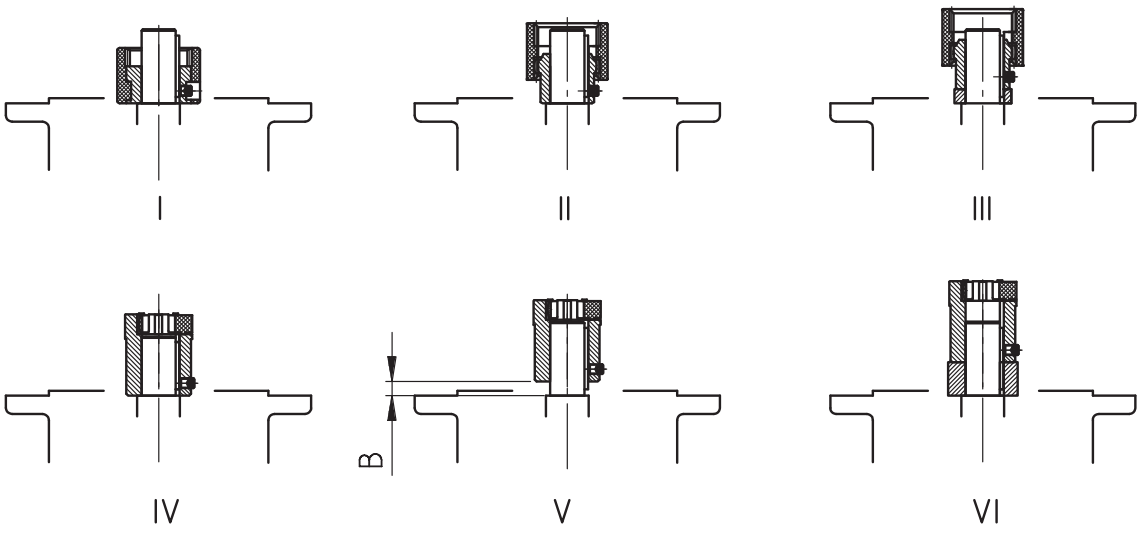


Figure 17: Fitting the coupling onto the motor shaft - various types of coupling

I Curved tooth coupling

II Curved tooth coupling, two-part

III Curved tooth coupling, two-part with spacer bush

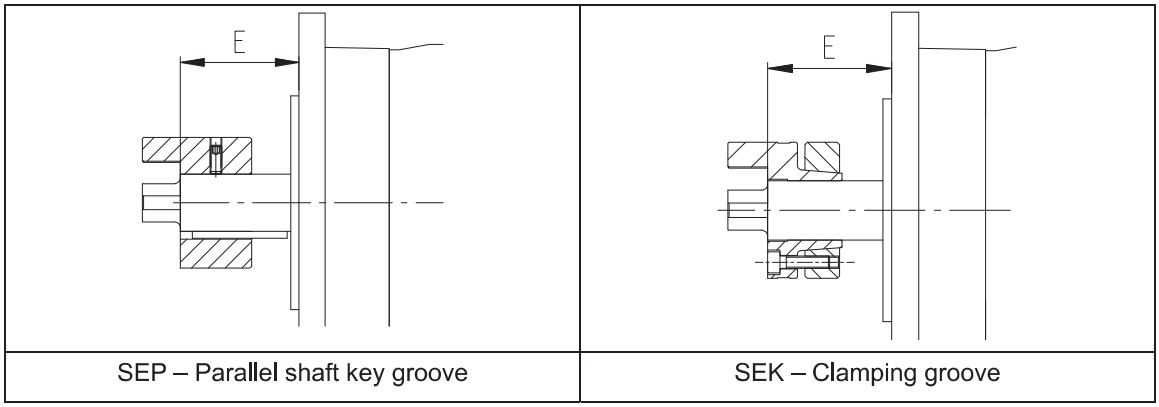
IV Claw coupling, two-part

V Claw coupling, two-part, observe dimension B:

Standard helical gear unit: SK 0, SK 01, SK 20, SK 25, SK 30, SK 33 (2-stage) SK 010, SK 200, SK 250, SK 300, SK 330 (3-stage)		
	IEC size 63	IEC size 71
Dimension B (Fig. V)	B = 4.5 mm	B = 11.5 mm

VI Claw coupling two-part with spacer bush

3.12 Installation of a servo motor (Option SEP / SEK)



SEP – Parallel shaft key groove	SEK – Clamping groove

E = Coupling installation size of flange system

Cylinder type	Coupling size*	Installation size E [mm]
SE. 100	GS 19	40
SE. 130	GS 24	50
SE. 165	GS 28	58
SE. 215	GS 28	80
	GS 48	80
SE. 300	GS 48	82
*) All coupling sizes are available as SEP or SEK versions, the ring gear has a hardness of (Shore) 98 Sh-A-GS, colour red		

Table 4: Allocation of cylinder types to coupling sizes

To prevent damage to the coupling, the dimension E which is stated in Table 12 must be complied with!

Assembly sequence for the connection of a servo motor to the servo adapter (Option SEP / SEK)

Please refer to the coupling manufacturer's operating/installation instructions for the assembly of the two halves of the coupling.

3.13 Fitting the cooling coil to the cooling system

WARNING — **Risk of injury**

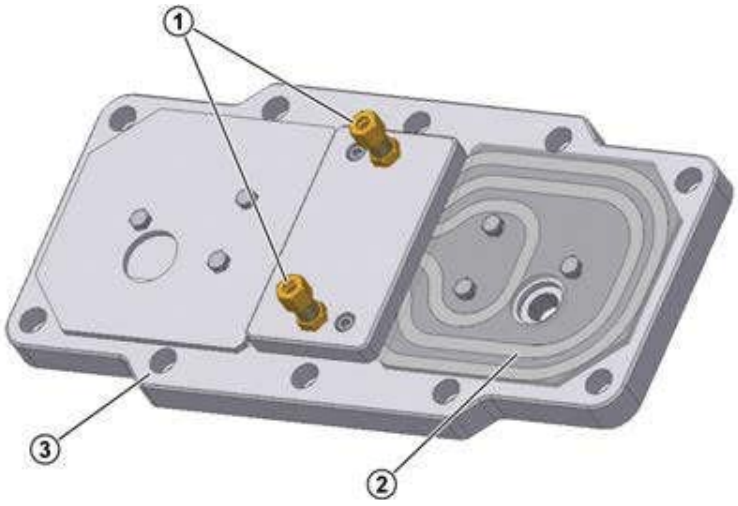
Possibility of injury due to pressure discharge.

Ensure that the pressure is released from the cooling circuit before carrying out any work on the gear unit.

The cooling coil is installed in the casing cover. Cutting ring screw threads according to DIN 2353 are located at the casing cover for the connection of a pipe with an external diameter of 10 mm.

Remove the closing cap from the screw neck prior to assembly to avoid any contamination of the cooling system. The screw necks should be connected with the coolant circuit, which must be provided by the operator. The flow direction of the coolant is irrelevant.

Make sure not to twist the screw necks during or after assembly as the cooling coil may be damaged. It must be ensured that no external forces act on the cooling coil.



	Explanation
1	Cutting ring screw threads
2	Cooling coil
3	Housing cover

Figure 18: Cooling cover

3.14 Installation of an oil expansion tank, Option OA

The expansion tank must be installed vertically with the hose connection facing downwards and the vent plug upwards. Please note the attached factory standard 0-530-04 for the installation.

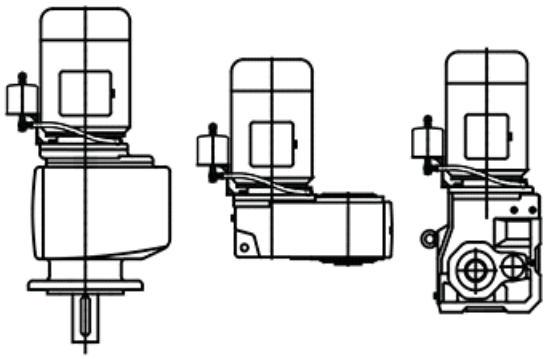


Figure 19: Installing the expansion tank

3.15 Subsequent paintwork

NOTICE	Damage to the device

For retrospective painting of the gear unit, the radial seals, rubber elements, pressure venting valves, hoses, type plates, adhesive labels and motor coupling components must not come into contact with paints, lacquers or solvents, as otherwise components may be damaged or made illegible.

4 Commissioning

4.1 Check the oil level

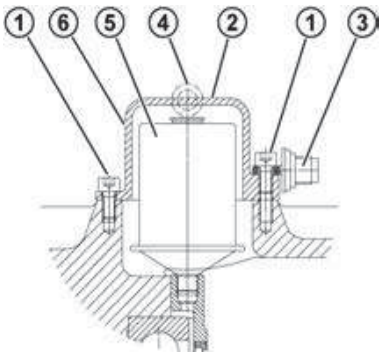
The oil level must be checked prior to commissioning (please see chapter 5.2 "Service and Maintenance Work").

4.2 Activating the automatic lubricant dispenser

Some gear unit types with standard motor (Option IEC/NEMA) have an automatic lubricant dispenser for the roller bearings. This dispenser must be activated prior to commissioning. The cartridge case cover of the adapter for attaching an IEC/NEMA standard motor has a red information sign for the activation of the lubricant dispenser. A grease escape opening which is closed with a G1/4 cap screw is located opposite to the lubricant dispenser. After activation of the lubricant dispenser, the cap screw can be removed and replaced with the grease collection container (Part No. 28301210) which is supplied separately with the delivery.

Activating the automatic lubricant dispenser:

1. Loosen and remove the cylindrical screws.
2. Remove the cartridge cover.
3. Screw the activation screw into the lubricant dispenser until the lug breaks off at the defined fracture point
4. Re-fit the cartridge cover and fasten it with the cylindrical screw (please see chapter 6.5 "Torque values").
5. Mark activation date on the adhesive label indicating the month/year



Explanation	
1	Cylindrical screw M8 x 16
2	Cartridge cover
3	Activation screw
4	Lug
5	Lubricant sensor
6	Position of adhesive label

Figure 20: Activating the automatic lubricant dispenser with standard motor mounting

Adhesive label:

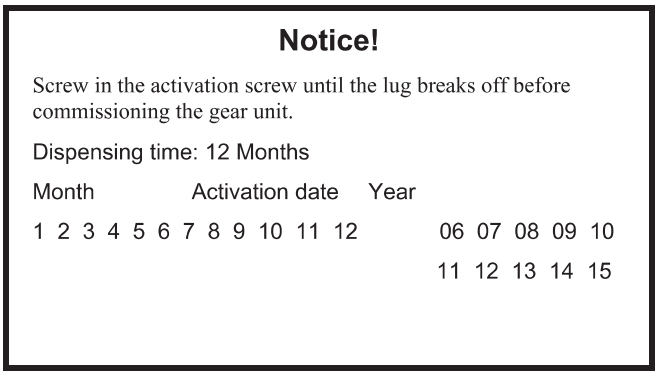


Figure 21: Adhesive label

4.3 Operation with lubricant cooling

Water cooling

NOTICE	Gear unit damage

The gear unit may be damaged by overheating.

The drive may only be commissioned after the cooling spiral has been connected to the cooling circuit, and the cooling circuit has been put into operation.

The coolant must have a similar thermal capacity as water (specific thermal capacity at 20°C c=4.18 kJ/kgK). Industrial water without any air bubbles or sediments is recommended as a coolant. The hardness of the water must be between 1 dH and 15 dH; the pH value must be between pH 7.4 and pH 9.5. No aggressive liquids may be added to the coolant!

The **coolant pressure** must not exceed **8 bar**. The required **quantity of coolant** is **10 litres/minute**, and the **coolant inlet temperature** must not exceed 40°C; we recommend **10°C.**

We also recommend fitting a pressure reducer or similar at the coolant inlet to avoid damage due to excessive pressure.

If there is a danger of frost the operator should add a suitable anti-freeze solution to the cooling water.

The **temperature of the cooling water** and the **cooling water flow rate** must be supervised and ensured by the operator.

Air/Oil cooler

The version and all important data for the air/oil cooler can be obtained from Catalogue G1000, or contact the manufacturer of the cooling unit.

4.4 Running-in time for the worm gear unit

Information **Running-in time**

In order to achieve maximum efficiency of the worm gear unit, the gear unit must be subjected to a running-in period of approx. 25 h – 48 h under maximum load.

There may be a reduction in efficiency before the running-in period is complete.

4.5 Checklist

Checklist		
Subject of check	**Date checked:**	**Information see Section**
Is the vent plug activated or the pressure vent screwed in?		3.4
Does the required configuration conform with the actual installation?		6.1
Are the external gear shaft forces within permitted limits (chain tension)?		3.6
Is the torque support correctly fitted?		3.7
Are contact guards fitted to rotating components?		3.9
Is the automatic lubricant dispenser activated?		4.2
Is the cooling cover connected to the cooling circuit?		3.13 4.3

5 Service and maintenance

WARNING **Danger of burns**

The surfaces of gear units or geared motors may become hot during or shortly after operation.

- Installation and maintenance work must only be performed when gear unit is at a standstill and has cooled down. The drive must be isolated and secured to prevent accidental start-up.
- Wear protective gloves.
- Shield hot surfaces with contact guards.

5.1 Service and Maintenance Intervals

Service and Maintenance Intervals	Service and Maintenance Work	Information see Section
At least every six months	• Visual inspection • Check for running noises • Check the oil level • Re-grease / remove excess grease (only applicable for free drive shaft / Option W and for agitator bearings / Option VL2 / VL3) • Replace the automatic lubricator / remove excess grease (for operating times < 8 h / day): (A replacement interval of 1 year is permissible for the lubricant dispenser) (Only for IEC / NEMA standard motor mounting). Empty or replace the lubricant collection container with every second replacement of the lubricant dispenser.	5.2
For operating temperatures up to 80 °C every 10000 operating hours, at least every 2 years	• Change the oil (The interval is doubled if filled with synthetic products) • Cleaning or replacing the vent plug • Replace shaft sealing rings if worn	5.2
Every 20000 operating hours, at least every 4 years	• Re-lubrication of the bearings in the gear unit	5.2
At least every 10 years	• General overhaul	5.2

Information — **Oil change intervals**

The oil change intervals apply for normal operating conditions and operating temperatures up to 80 °C. The oil change intervals are reduced in the case of extreme conditions (operating temperatures higher than 80 °C, high humidity, aggressive environment and frequent fluctuations in the operating temperature).

5.2 Service and Maintenance Work

WARNING — **Severe personal injury**

Severe injury and material damage may be caused by incorrect servicing and maintenance work.

Servicing and maintenance work must only be performed by qualified specialist personnel. Wear the necessary protective clothing for servicing and maintenance work (e.g. industrial footwear, protective gloves, goggles, etc.)

WARNING — **Severe personal injury**

Risk of injury due to rapidly rotating and hot machine components.

Installation and maintenance work must only be performed when gear units are at a standstill and have cooled down. The drive must be isolated and secured to prevent accidental start-up.

WARNING — **Severe personal injury**

Particles or liquids thrown up during servicing and maintenance can cause injuries.

- Observe the safety information when cleaning with compressed air or a pressure washer.

WARNING — **Danger of burns**

Danger of burns due to hot oil.

- Allow the gear unit to cool down before carrying out maintenance or repair work.
- Wear protective gloves.

NOTICE — **Leaks**

Take care that no dirt or water enters the shaft sealing rings or the vents when cleaning

Dirt or water in the shaft sealing rings may cause leaks.

Visual inspection

The gear unit must be checked for leaks. In addition, the gear unit must be inspected for external damage and cracks in the hoses, hose connections and rubber buffers. Have the gear unit repaired in case of leaks, e.g. dripping gear oil or cooling water, damage or cracks. Please contact the NORD service department.

Information — **Shaft sealing rings**

Shaft sealing rings are rubbing seals and have sealing lips made from an elastomer material. These sealing lips are lubricated with a special grease at the factory. This reduces the wear due to their function and ensures a long service life. An oil film in the region of the rubbing sealing lip is therefore normal and is not due to leakage.(please see chapter 6.7 "Leaks and seals")

Check for running noises

If the gear unit produces unusual running noises and/or vibrations, this could indicate damage to the gear unit. In this case the gear should be shut down and a general overhaul carried out.

Check the oil level

Section 6.1 "Configurations and maintenance" describes the versions and the corresponding oil level screws. With double gear units, the oil level must be checked on both units. The pressure vent must be at the position marked in Section 6.1 "Configurations and maintenance"Bauformen und Wartung</dg_ref_source_inline>.

The oil level does not need to be checked on gear units without oil level screw (please see chapter 6.1 "Configurations and maintenance").

Gear unit types that are not supplied full of oil must be filled before the oil level is checked.

Check the oil level with an oil temperature of between 20 °C to 40 °C.

1. The oil level may only be checked when the gear unit is at a standstill and has cooled down. The gear unit must be secured to prevent accidental switch-on.
2. The oil level screw corresponding to the version must be screwed out (please see chapter 6.1 "Configurations and maintenance").

Information — **Checking the oil level**

At the first oil level check a small amount of oil may escape, as the oil level may be below the lower edge of the oil level hole.

3. **Gear units with oil level screw:** The correct oil level is at the lower edge of the oil level hole. If the oil level is too low, this must be corrected using the correct type of oil. An oil level glass is available instead of the oil level screw
4. **Gear units with an oil level tank:** The oil level must be checked in the oil level tank with the aid of the dipstick plug (thread G1 1/4). The oil level must be between the upper and lower marking when the dipstick is fully screwed in (see Figure 22). Top up the oil level with the relevant type of oil as necessary. These gearboxes may only be operated in the configuration stated in Section 6.1 "Configurations and maintenance".
5. The oil level screw or the cap screw with dipstick and all other loosened screws must be correctly re-tightened.

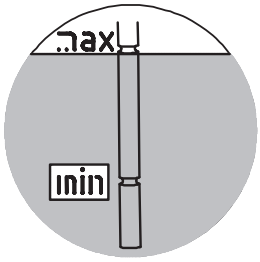


Figure 22: Checking the oil level with a dipstick

Re-greasing

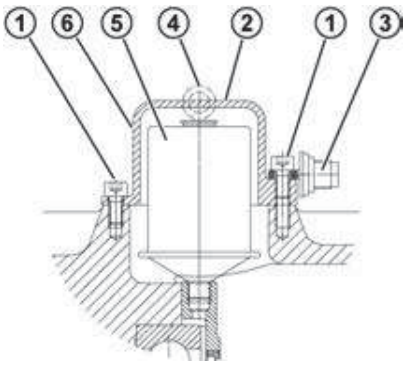
Some gear unit designs (free drive shaft, Option W, agitator designs VL2 and VL3) are equipped with a re-greasing device.

For agitator versions VL2 and VL3, the vent screw located opposite to the grease nipple must be unscrewed before re-greasing. Grease should be injected until a quantity of 20 - 25 g escapes from the vent hole. After this, the vent plug must be reinserted and tightened.

For Option W and some IEC adapters, the outer roller bearing must be re-greased with approx. 20 - 25 g of grease via the grease nipple provided. Remove any excess grease from the adapter.

Recommended grease: Petamo GHY 133N (please see chapter 6.2 "Lubricants") (Fa. Klüber Lubrication).

Replacing the automatic lubricant dispenser



	Explanation
1	Cylindrical screws M8 x 16
2	Cartridge cover
3	Activation screw
4	Lug
5	Lubricant sensor
6	Position of adhesive label

Figure 23: Replacing the automatic lubricant dispenser with standard motor mounting

The cartridge cover must be unscrewed. The lubrication dispenser is screwed out and replaced with a new component (Part No. 283 0100). Remove any excess grease from the adapter. Then activate (please see chapter 4.2 "Activating the automatic lubricant dispenser").

Empty or replace the grease collection container (Part No. 28301210) with every second replacement of the lubricant container. To empty the container, unscrew it from the screw fitting. The container has an internal piston, which can be pressed back with a rod with a maximum diameter of 10 mm. Collect the grease which is pressed out and dispose of it correctly. Due to the shape of the container, a residual quantity of grease remains in the container. After emptying and cleaning the container, it can be screwed back into the drain hole in the IEC adapter. Replace the container with a new one if it is damaged.

Change the oil

The figures in Section 6.1 "Configurations and maintenance" show the oil drain screw, the oil level screw and the pressure vent screw for various designs.

Procedure:

1. Place a catchment vessel under the oil drain screw or the oil drain cock.
2. Completely remove the oil level screw or screwed sealing plug with dipstick if an oil level tank is being used and unscrew oil drain screw.

WARNING — **Danger of burns**

Danger of burns due to hot oil.

- Allow the gear unit to cool down before carrying out maintenance or repair work.
- Wear protective gloves.

3. Drain all the oil from the gear unit.
4. If the sealing ring of the oil drain screw or oil level screw is damaged in the thread, a new oil level screw must be used or the thread must be cleaned and coated with securing lubricant, e.g. Loctite 242, Loxeal 54-03 prior to insertion.
5. Screw the oil drain screw into the hole and tighten to the correct torque (please see chapter 6.5 "Torque values").
6. Using a suitable filling device, refill with oil of the same type through the oil level hole until oil emerges from the oil level hole. (The oil can also be filled through the pressure vent screw or a sealing plug located higher than the oil level). If an oil level tank is used, fill the oil through the upper inlet (thread G1¼) until the oil level is set as described in Section 5.2 "Service and Maintenance Work".
7. Wait at least 15 minutes, or at least 30 minutes if an oil level tank is used, and then check the oil level. Proceed as described in Section 5.2 "Service and Maintenance Work".

Information — **Oil level**

The oil does not need to be changed on gear units without oil level screw (please see chapter 6.1 "Configurations and maintenance"). These gear units are lubricated for life.

Standard helical gear units have no oil level screw. Here, the oil is topped up through the pressure vent bolt using the quantities listed in the table in Section 6.4 "Helical gear unit".

Cleaning or replacing the vent plug

Unscrew the vent screw and thoroughly clean it (e.g. with compressed air) and fit the vent screw in the same place, If necessary, use a new vent screw with a new sealing ring.

Replace the shaft sealing ring

Once the shaft sealing ring has reached the end of its service life, the oil film in the region of the sealing lip increases and a measurable leakage with dripping oil occurs. **The shaft sealing ring must then be replaced.** The space between the sealing lip and the protective lip must be filled approximately 50 % with grease on fitting (recommended grease: PETAMO GHY 133N). Take care that after fitting, the new shaft sealing ring does not run in the old wear track.

Re-lubricating bearings

For bearings which are not oil-lubricated and whose holes are completely above the oil level, replace the roller bearing grease (recommended grease: PETAMO GHY 133N). Please contact the NORD service department.

General overhaul

For this, the gear unit must be completely dismantled. The following work must be carried out:

- Clean all gear unit components
- Examine all gear unit components for damage
- All damaged components must be replaced
- All roller bearings must be replaced
- Replace back stops if fitted
- Replace all seals, radial seals and Nilos rings
- Replace plastic and elastomer components of the motor coupling

The general overhaul must be carried out by qualified personnel in a specialist workshop with appropriate equipment in observance of national regulations and laws. We recommend that the general overhaul is carried out by the NORD Service department.

6 Appendix

6.1 Configurations and maintenance

Explanation of symbols for the following version illustrations:

Venting

Oil level

Oil drain

Information **Gear unit - Lubrication**

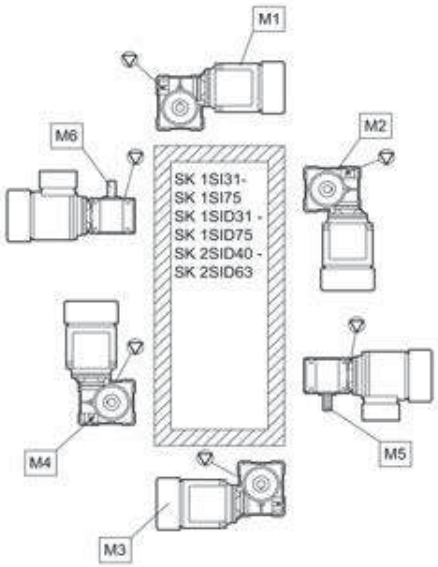
SK 320, SK 172, SK 272, SK 372 as well as SK 273 and SK 373, SK 01282 NB, SK 0282 NB, SK 1382 NB and UNIVERSAL / MINIBLOC gear units are lubricated for life. These gear units do not have an oil filler screw.

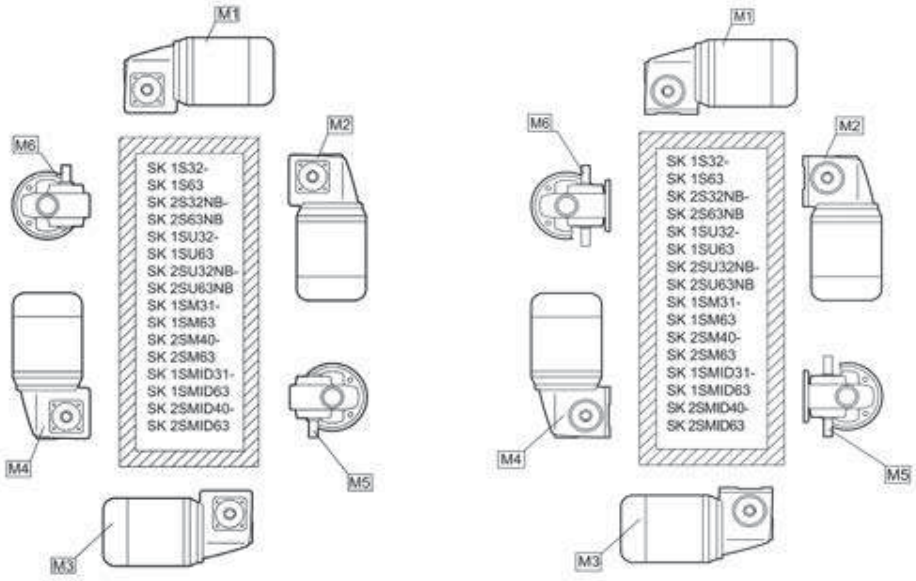
UNIVERSAL / MINIBLOC worm gear units

NORD UNIVERSAL / MINIBLOC worm gear units are suitable for all installation positions. They have an oil filler which is independent of the configuration.

As an option, types SI and SMI can be equipped with a vent screw. Gear units with vents must be installed in the stated position.

Types SI, SMI, S, SM and SU as 2-stage gear unit types and types SI, SMI as worm gear units for direct motor mounting have an oil filler which depends on the configuration and must be installed in the stated position.





Parallel shaft gear units with oil level tank

The following applies for SK 9282, SK 9382, SK 10282, SK 10382, SK 10382.1, SK 11282, SK 11382, SK 11382.1 and SK 12382 in the M4 configuration with oil level tank:

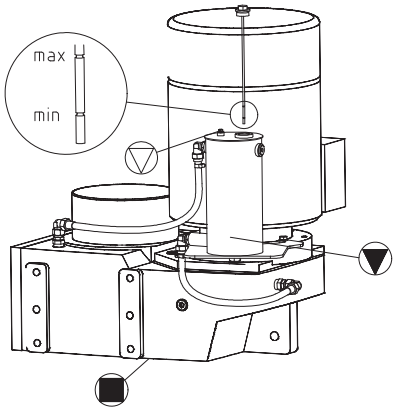
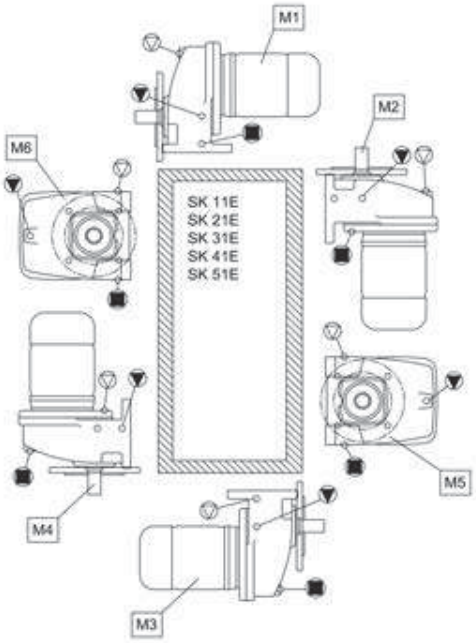


Figure 24: Oil level check with oil level tank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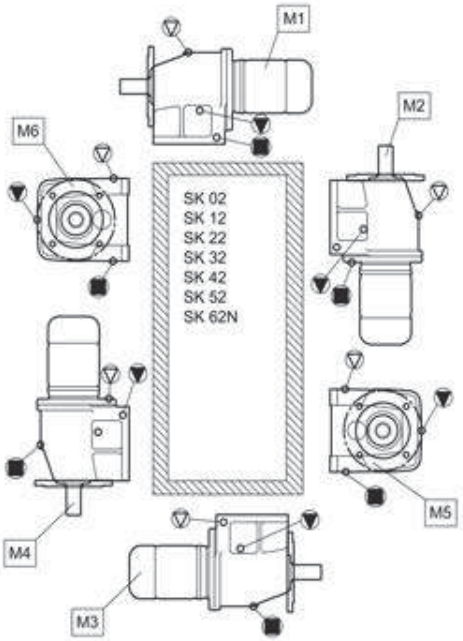
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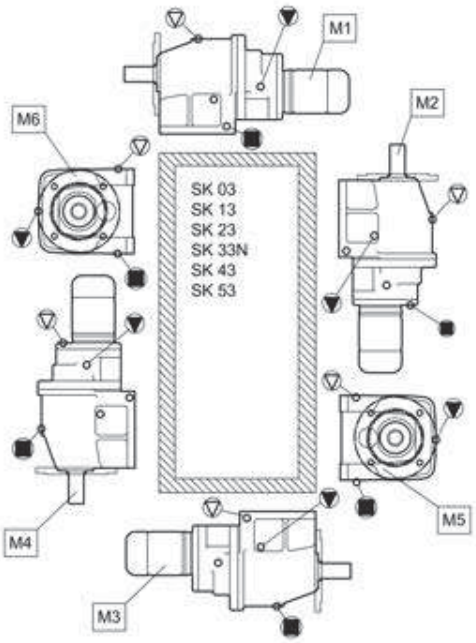
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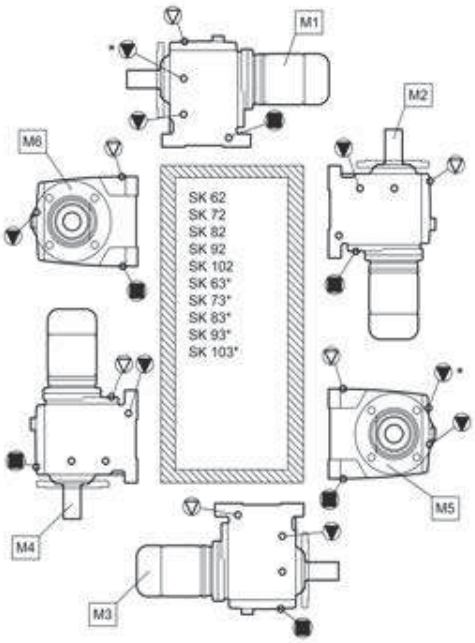
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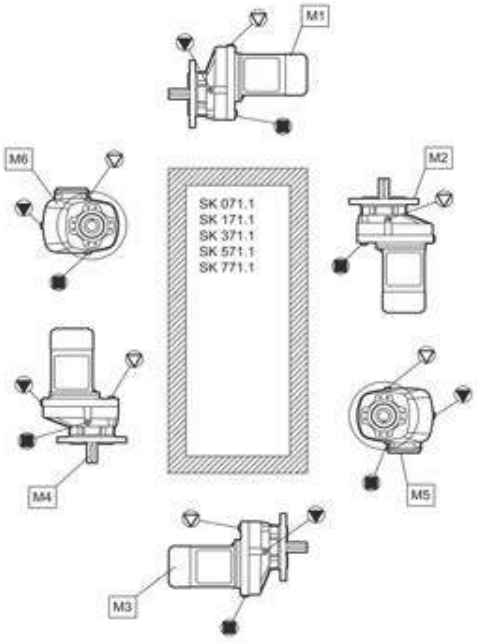
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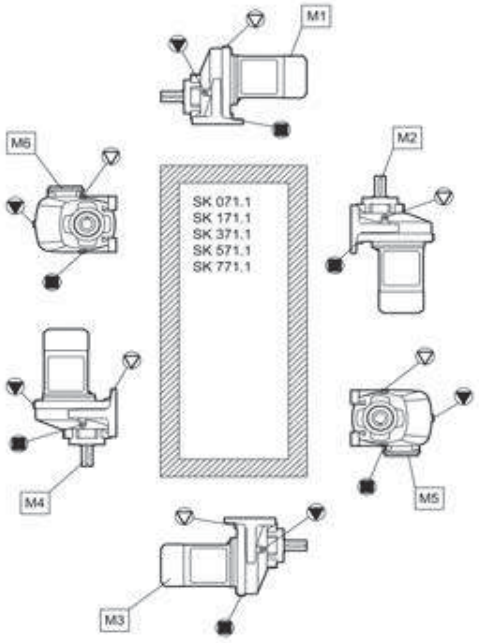
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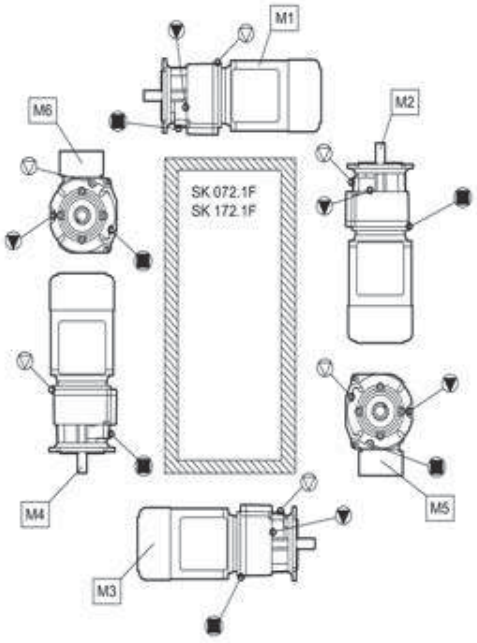
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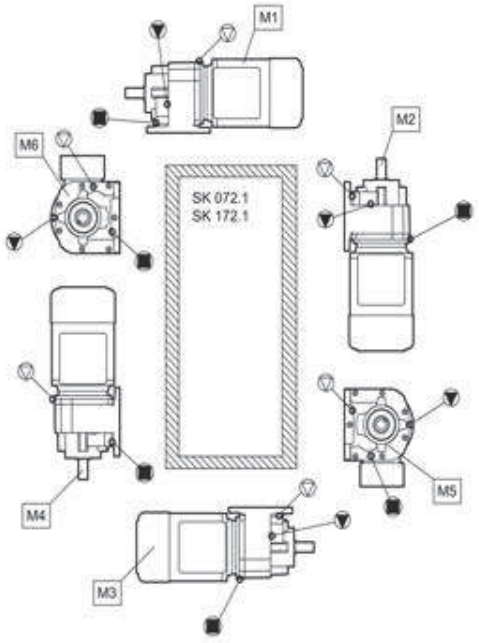
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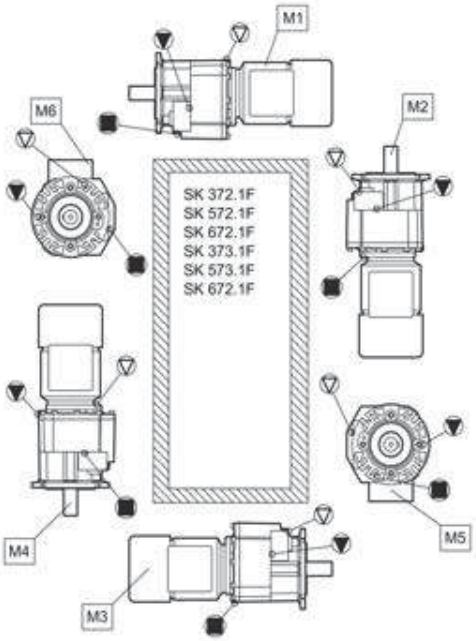
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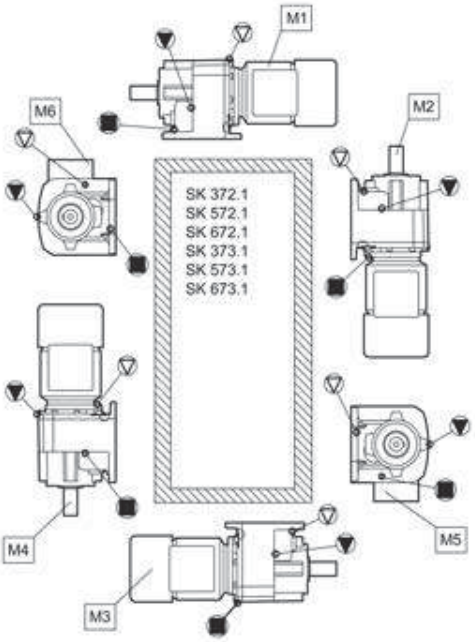
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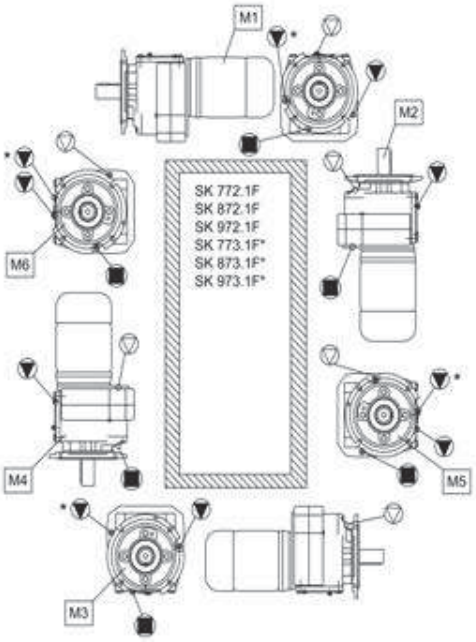
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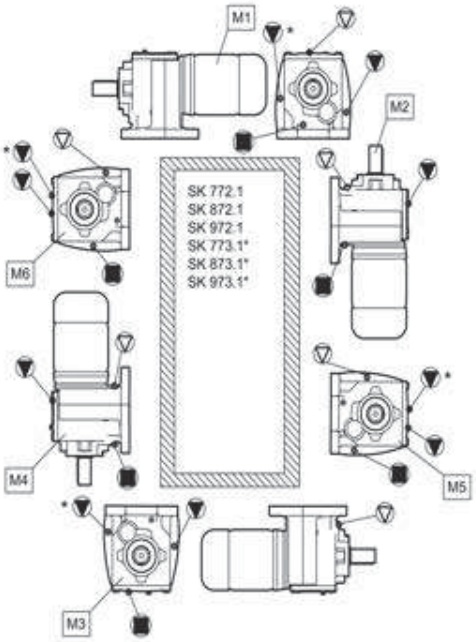
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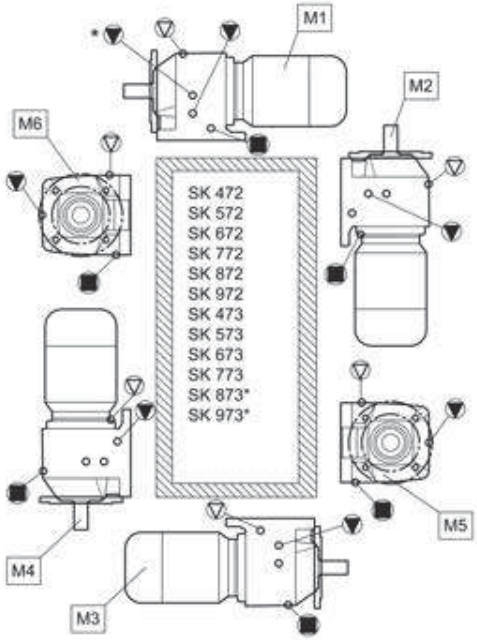
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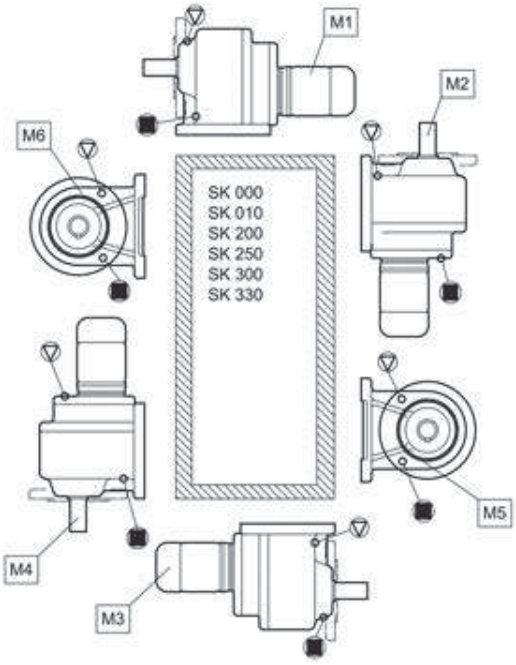
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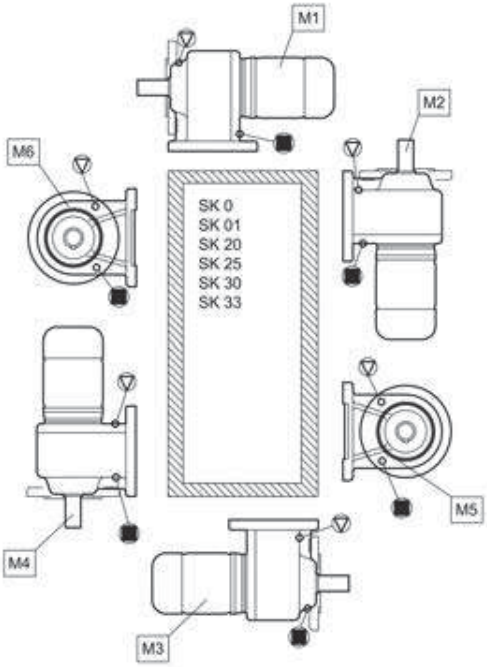
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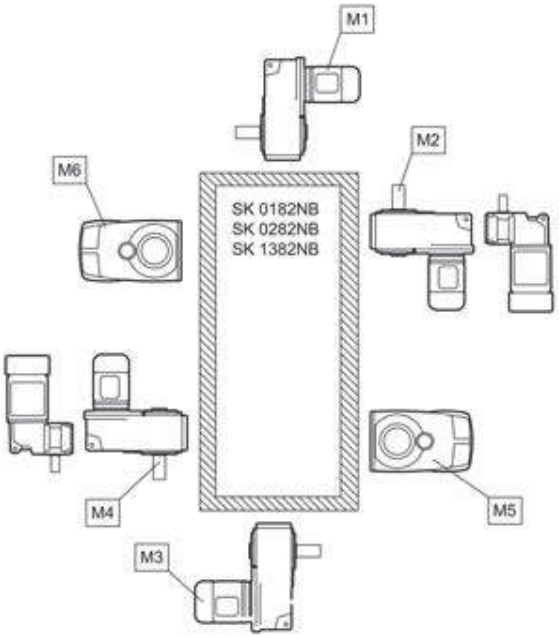
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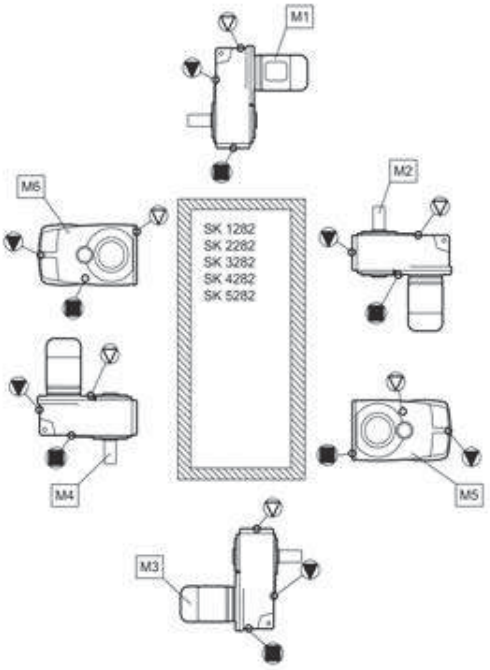
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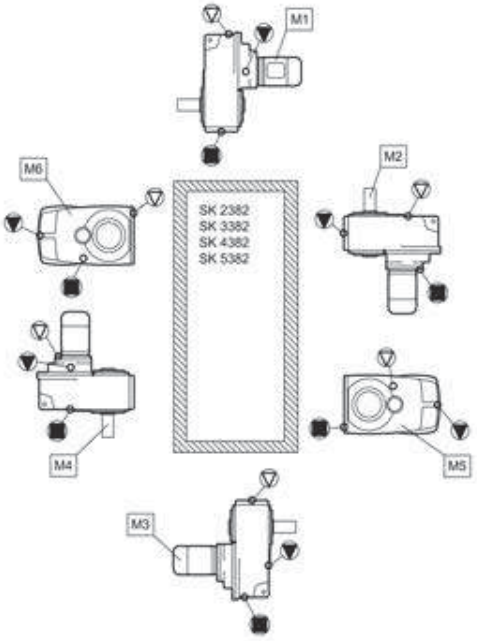
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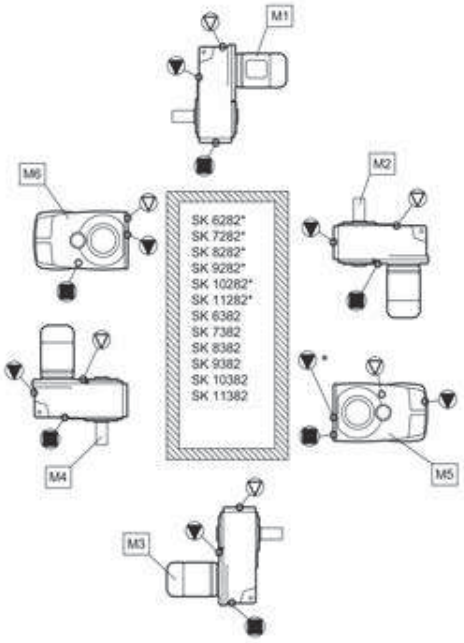
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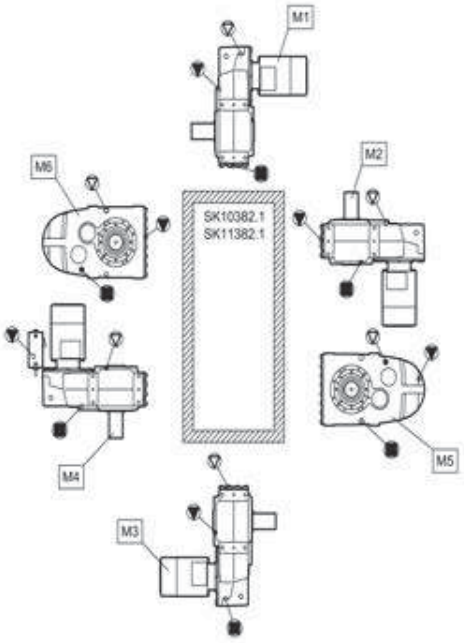
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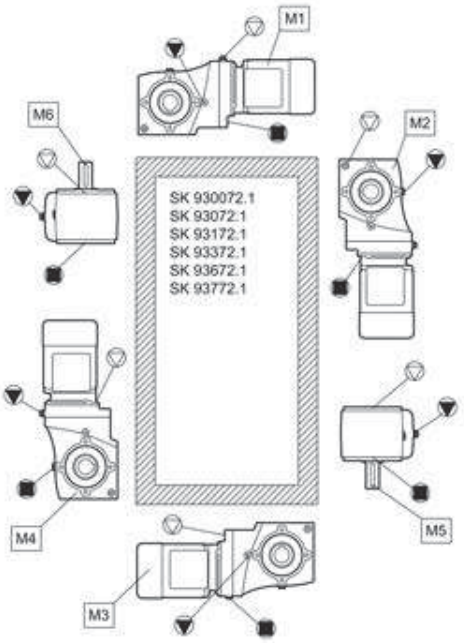
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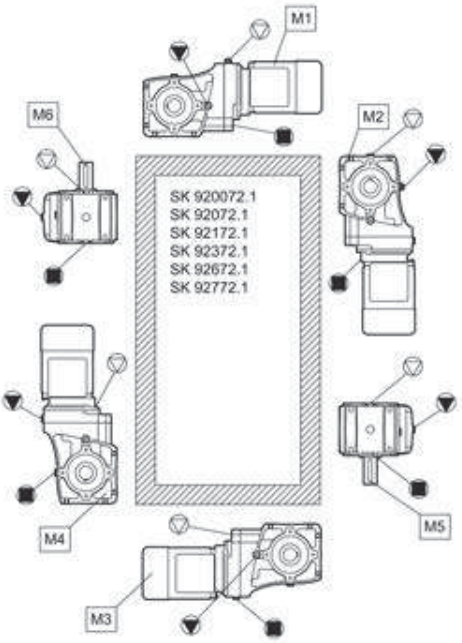
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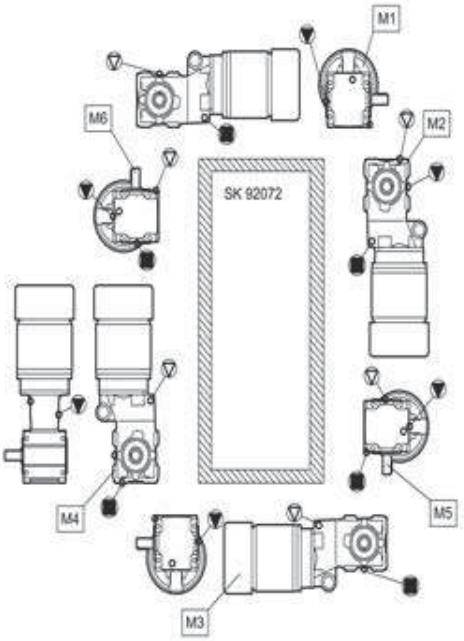
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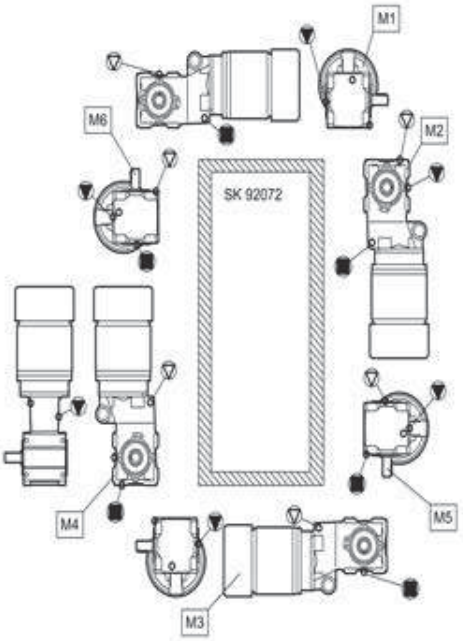
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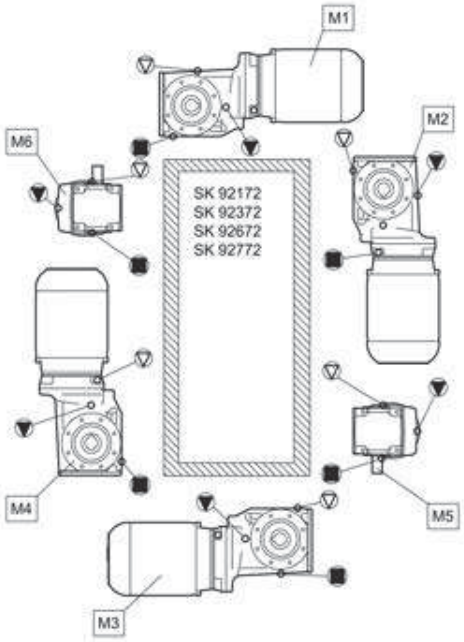
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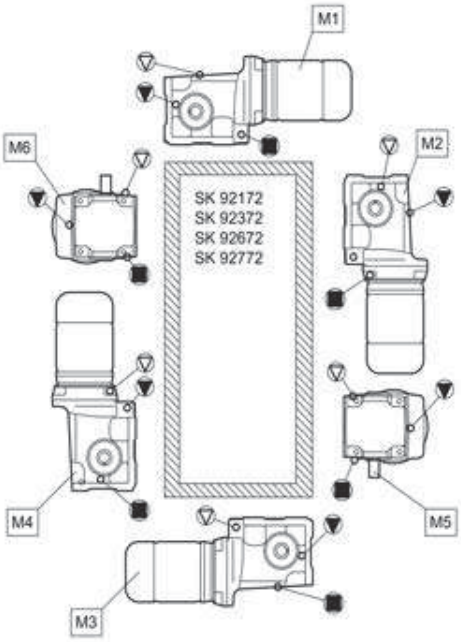
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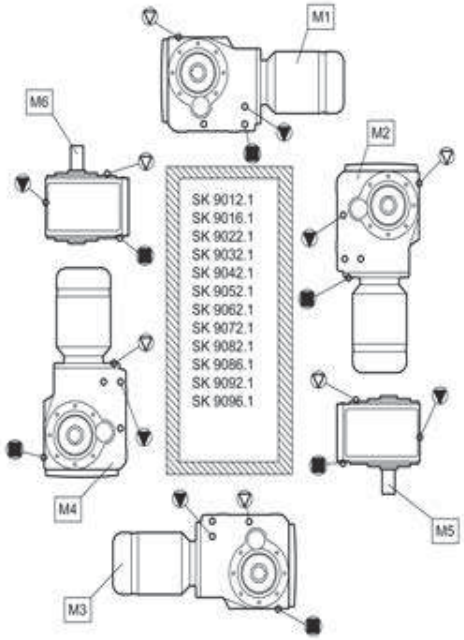
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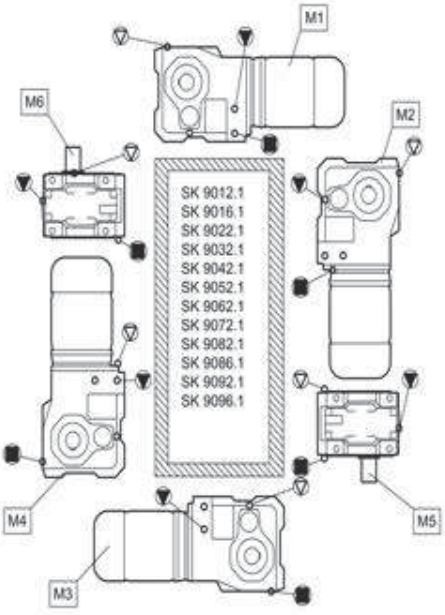
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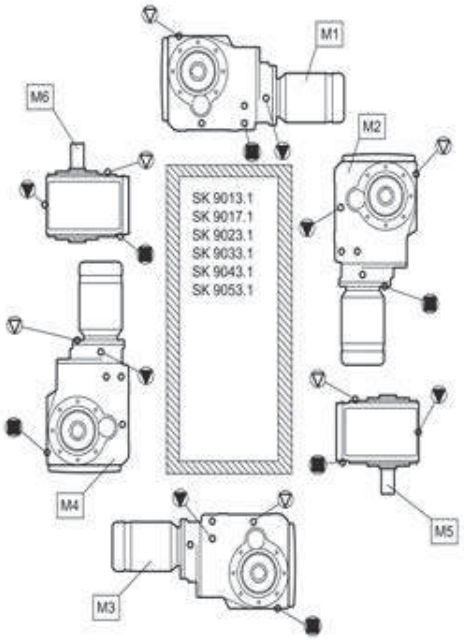
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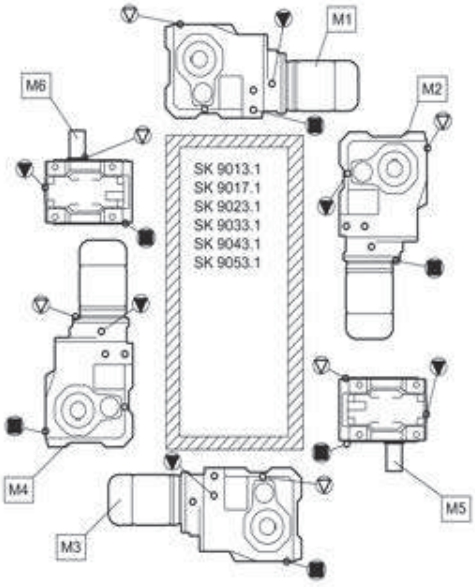
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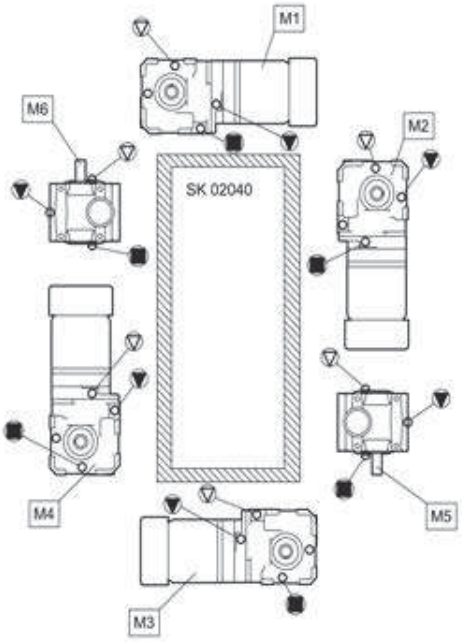
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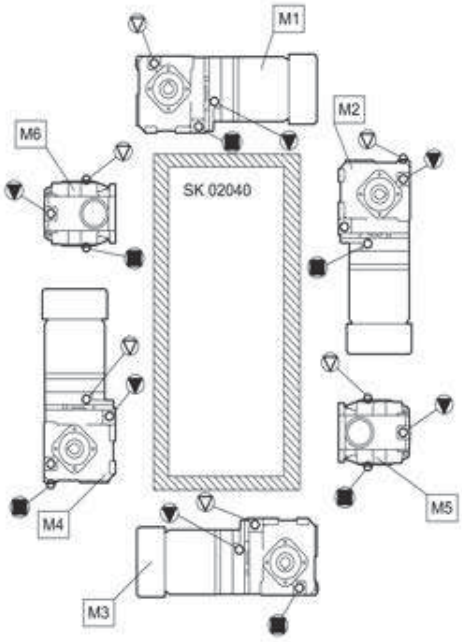
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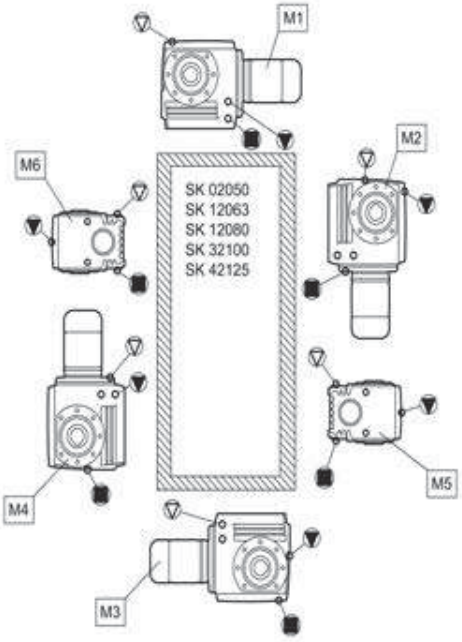
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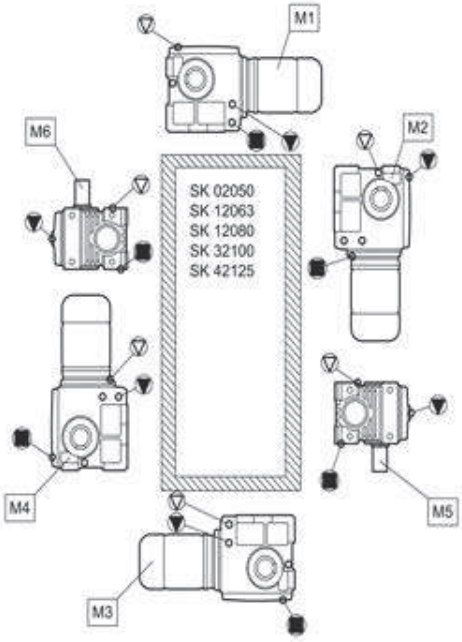
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